ROE HIGHWAY EXTENSION STAGE 7
(South Street to Kwinana Freeway in Leeming)

DRAFT ENVIRONMENTAL SCOPING DOCUMENT

PUBLIC ENVIRONMENTAL REVIEW
(Assessment Number 1466)

MAJOR PROJECTS DIRECTORATE
MAIN ROADS WESTERN AUSTRALIA

August 2003

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1. INTRODUCTION

1.1 Purpose of Scoping Document

This scoping document deals with the environmental issues pertinent to the impact assessment of the extension of Roe Highway between South Street and Kwinana Freeway in Leeming. It provides the basis of understanding between the proponent (Main Roads Western Australia) and the Environmental Protection Authority (EPA) regarding the assessment of the extension proposal, and also sets out indicative timelines for the assessment.

1.1.1 *Western Australian Environmental Protection Act 1986*

This scope has been prepared to comply with the Western Australian Environmental Impact Assessment (Part IV Division I) Administration Procedures 2002, as a result of the EPA having set a level of assessment for the project as Public Environmental Review (PER). Once accepted by the EPA, this scoping document will guide the preparation of the PER, which will be released for public review for a period of eight weeks.

1.1.2 *Commonwealth Environmental Protection and Biodiversity Conservation Act*

On 13 March 2003, the delegate for the Commonwealth Minister for the Environment and Heritage determined that the proposal by Main Roads Western Australia to construct and operate an extension to the Roe Highway between South Street and Kwinana Freeway, Perth, Western Australia, is a controlled action under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

On 14 May 2003, the Commonwealth Minister for the Environment and Heritage determined that assessment was to be by accredited process utilising the Public Environment Review (PER) under Section 38 of the Western Australian Environmental Protection Act (1986) to meet the assessment requirement under the EPBC Act. Once the assessment process under the Western Australian Environmental Protection Act (1986) is complete, the Commonwealth Minister for the Environment and Heritage will then consider whether to approve the proposal under the EPBC Act.

As the Commonwealth has determined that the proposal requires assessment and approval under the EPBC Act, and has accredited the State PER assessment process, the State PER process will include assessment of the matters relevant to Commonwealth approval. Therefore this Environmental Scoping document for the PER also covers any impacts of the proposal pertinent to the controlling provision under the EPBC Act, in this instance Sections 18 and 18A (Listed threatened species and communities).

The PER will address matters under the Environment Protection and Biodiversity Conservation Regulations 2000 Schedule 4, including any new matters identified during the PER investigations that are protected under the EPBC Act.

Sections of this scoping document that have direct relevance to the EPBC Act are Sections 4.2.3, 4.2.5, the tables in Sections 5 and 7.

1.2 Proponent

Main Roads Western Australia is the proponent for the extension project. Address and contact details are given below.

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2. EXTENSION PROPOSAL

The proposal is to extend Roe Highway from South Street to connect into Kwinana Freeway in the southern Metropolitan area of Leeming. The concept design for the project is shown superimposed on an aerial photograph of the area in Figure 2.1. Land for the Highway was set-aside in the Metropolitan Region Scheme in 1963, and all of the land required for construction of the project is owned by the Government of Western Australia.

This stage of the Roe Highway extension is approximately 4.6 kilometres in length. The construction footprint will not require disturbance to all of the land inside of the road reserve. The average width of disturbance calculated from the concept design available as of July 2003 is 70 metres. This gives a construction footprint of around 32 hectares.

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. Earthworks and associated infrastructure such as road drainage for the ultimate extent (three lanes in each direction) will be constructed. Other elements of the proposal are:

- Grade separated interchanges at South Street, Karel Avenue and the Kwinana Freeway;
- Continuation of the Shared Path network along the Highway and connections to existing Shared Path networks;
- Provision of noise amelioration where appropriate;
- Public access to the adjacent Ken Hurst Park;
- Appropriate fencing of the road reserve;
- Rehabilitation/landscaping of all areas disturbed by construction, and
- Provision for fauna movement.

Main Roads will be delivering this project through an alliance contract. This form of contract allows increased flexibility to deal with environmental issues.

3. PROJECT HISTORY

3.1 Project Justification

Roe Highway has been planned as part of a strategic ring road for Perth since the early 1960s. It was planned to provide a connection between the main northern and eastern gateways to the metropolitan area (Great Northern Highway and Great Eastern Highway) and the industrial areas of Midland, Welshpool and Canning Vale. Along with Reid Highway on the north, it was conceived as providing easy access to these areas from the major north-south route into and out of Perth (Kwinana and Mitchell Freeways). These routes are shown on the plan in Figure 3.1. Land for the Highway was set aside in the Metropolitan Region Scheme in 1963.

Construction of the Highway from its northern end (connection with Reid and Great Northern Highways) as far as Nicholson Road is now complete. Work on a further stage between Nicholson Road and South Street is currently underway. The final link into Kwinana Freeway is the section dealt with in this referral.

A recent review of the metropolitan freight network (road and rail) 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 (Freight Network Review Master Plan Working Group 2002).

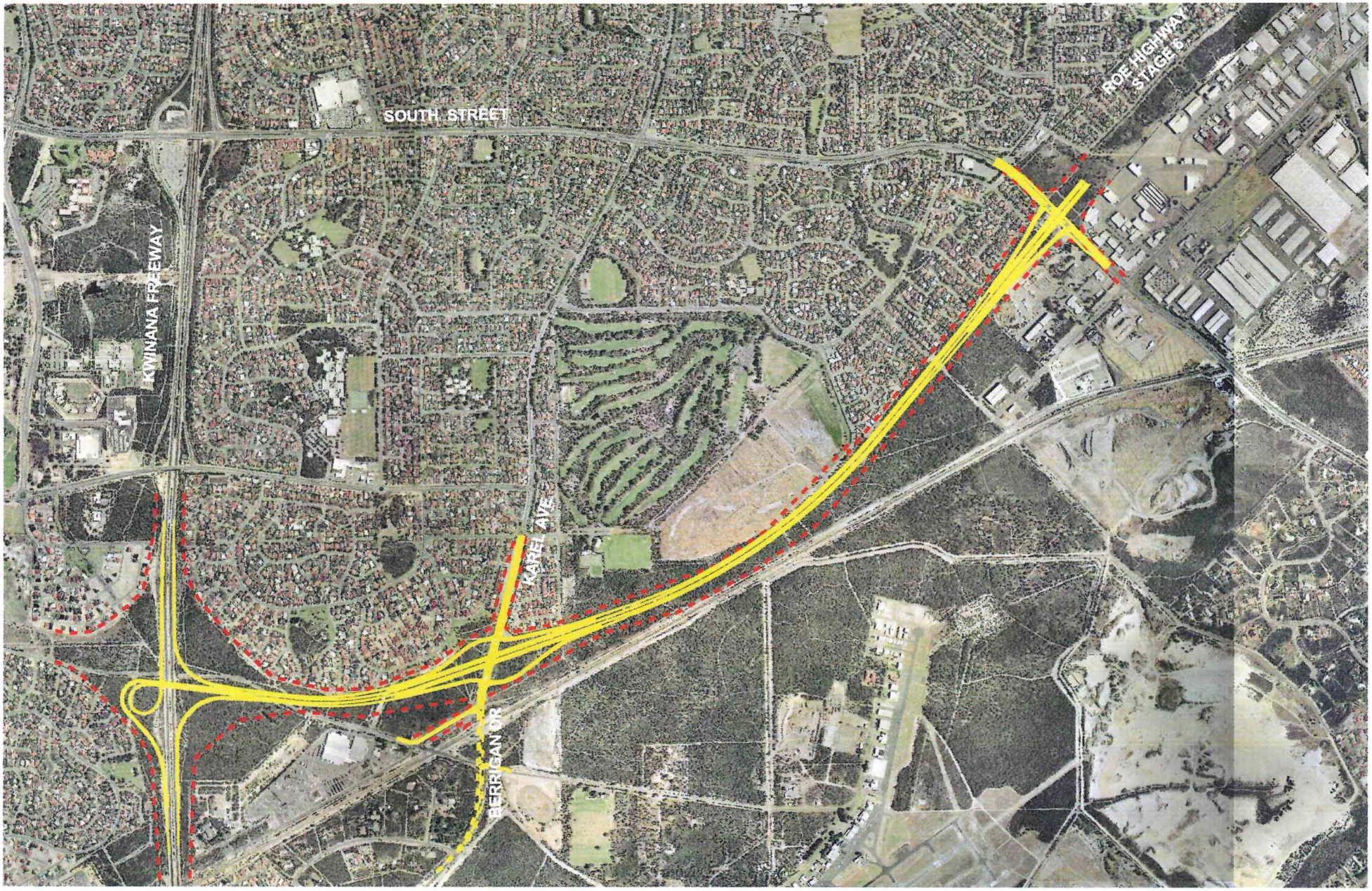


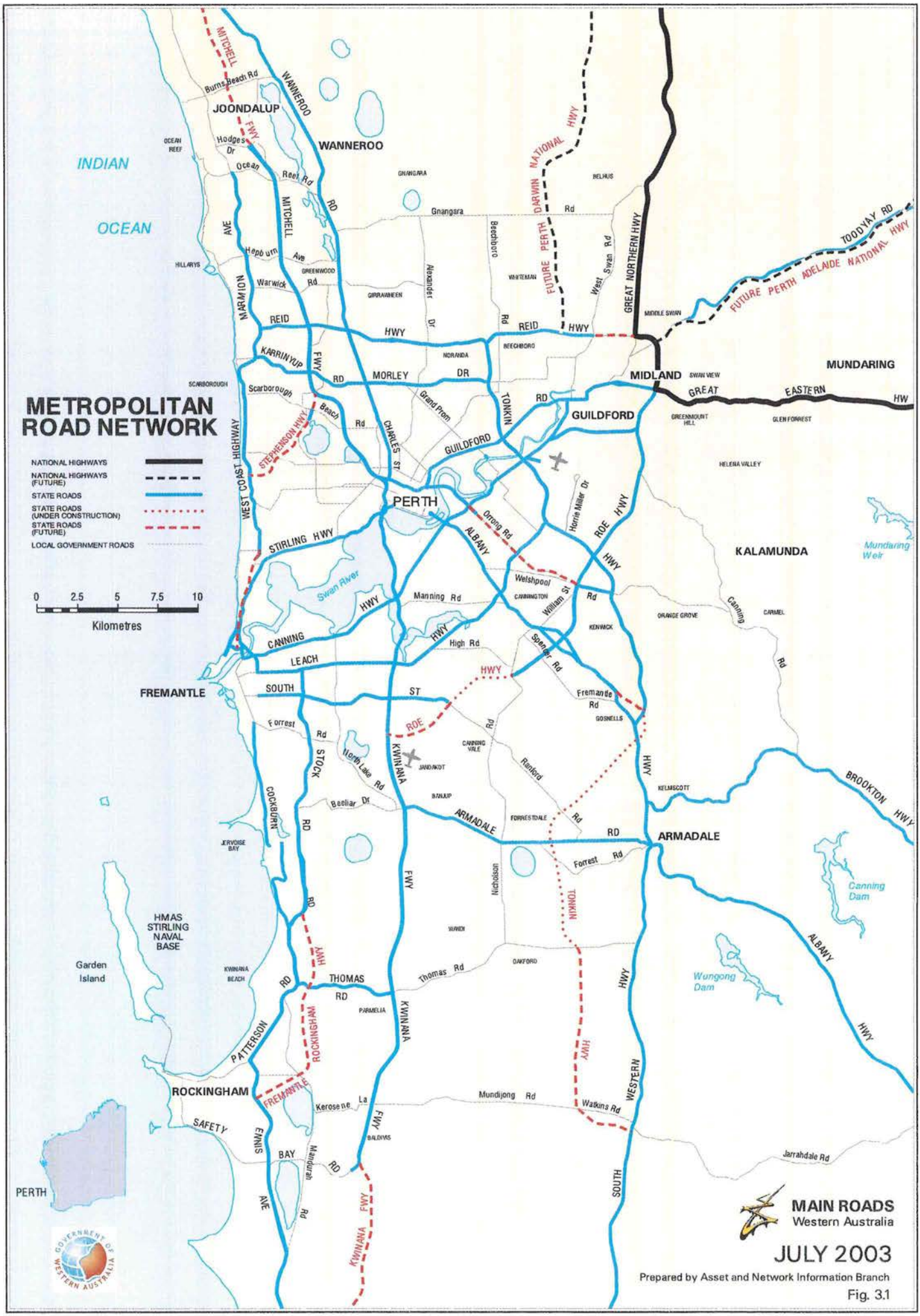
Fig. 2.1

GOVERNMENT OF WESTERN AUSTRALIA

MAIN ROADS
Western Australia

ROE HIGHWAY STAGE 7
South Street to Kwinana Freeway
December 2002

MRS Boundary
Concept Alignment


METROPOLITAN ROAD NETWORK
NATIONAL HIGHWAYS
NATIONAL HIGHWAYS (FUTURE)
STATE ROADS
STATE ROADS (UNDER CONSTRUCTION)
STATE ROADS (FUTURE)
LOCAL GOVERNMENT ROADS
0 2.5 5 7.5 10
Kilometres
INDIAN OCEAN
PERTH
FREMANTLE
JOONDALUP
WANNEROO
ROCKINGHAM
MIDLAND
GUILDFORD
ARMADALE
KALAMUNDA
MUNDARING
HMAS STIRLING NAVAL BASE
Garden Island
Swan River
Mundaring Weir
Canning Dam
Wungong Dam
MITCHELL FWY
WANNEROO RD
DARWIN NATIONAL HWY
FUTURE PERTH ADELAIDE NATIONAL HWY
GREAT NORTHERN HWY
TOODYAY RD
REID HWY
KARRINYUP RD
MORLEY DR
GREAT EASTERN HWY
WEST COAST HIGHWAY
STEPHENSON HWY
STIRLING HWY
CANNING HWY
LEACH HWY
SOUTH ST
ROE HWY
ALBANY HWY
TONKIN HWY
KWINANA FWY
ROCKINGHAM RD
PATTERSON AVE
FREMANTLE ROCKINGHAM HWY
BROOKTON HWY
SOUTH WESTERN HWY
MAIN ROADS Western Australia
JULY 2003
Prepared by Asset and Network Information Branch
Fig. 3.1

3.2 Alignment Selection

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. This committee was required to consider several possible variations (including the Metropolitan Region Scheme alignment) of the route for the Highway extension between South Street and Kwinana Freeway and to recommend a preferred alignment.

The Local Impacts Committee undertook a wide ranging value management assessment of, and extensive consultation regarding the various route options proposed. As a result of this process the option that follows the existing Metropolitan Region Scheme alignment was ranked as the best option on non-cost evaluation criteria, and also after cost was taken into account.

The non-cost evaluation criteria developed by the Local Impacts Committee for the value management assessment, and the relative importance given to each one are tabulated below in descending order of importance.

Table 3.1 LIC Value Management Workshop Criteria and Criteria Weightings

CRITERION	WEIGHTING
Impacts on Declared Rare Flora	18
Planning Flexibility	16
Impacts on Groundwater Protection Areas	15
Social Amenity – noise and vibration impacts on adjacent residences	13
Impacts on Bush Forever Sites	11
Social Equity	7
Implications for Project Timeframe	7
Impacts on Remnant Vegetation	5
Impacts on Government Property	4
Impacts on Private Property	2
Visual Impacts	2
Total Weighting	100

All of the environmental issues identified by the LIC will be addressed in the PER.

4. EXISTING ENVIRONMENT

4.1 Physical

The project area is characterised by undulating dunes of the Bassendean System ranging in height from 25 metres AHD near South Street to around 40 metres AHD at the Kwinana Freeway end. The watertable is known to be at least two metres below the surface during the wet season along the proposed alignment. There is no co-coordinated surface drainage in the area, and any precipitation infiltrates rapidly where it falls.

The deep sandy soils present along the alignment have both positive and negative implications for the project. The inherent instability of these sands will require management during construction, and will present additional challenges to the revegetation of disturbed areas. Outlines of the management of construction impacts and also an outline of revegetation initiatives will be addressed in the PER.

On the positive side, the permeability of the Bassendean sands will allow for a minimalist approach to drainage design, which in turn minimises the impact on the surrounding native

vegetation. A drainage strategy that has been approved by Water and Rivers Commission officers will be presented in the PER.

The alignment traverses the Jandakot Underground Water Pollution Control Area (UWPCA) between the Karel Avenue intersection and Kwinana Freeway. The UWPCAs on the Swan Coastal Plain have been proclaimed in order to protect public water supplies through control of land use. The area of the alignment inside the UWPCA is classified as being a Priority 3 protection area, where the construction and operation of the highway is a conforming use.

Design implications and management of impacts during construction will be covered by the drainage strategy for the project, which will be presented in the PER.

There are no wetlands along the alignment, and thus there will be no discussion of wetlands in the PER.

4.2 Biological

Figure 4.1 shows the extent of remnant bushland along the alignment, the two Bush Forever Sites in the vicinity, and the location of the population of Declared Rare Flora.

4.2.1 Vegetation

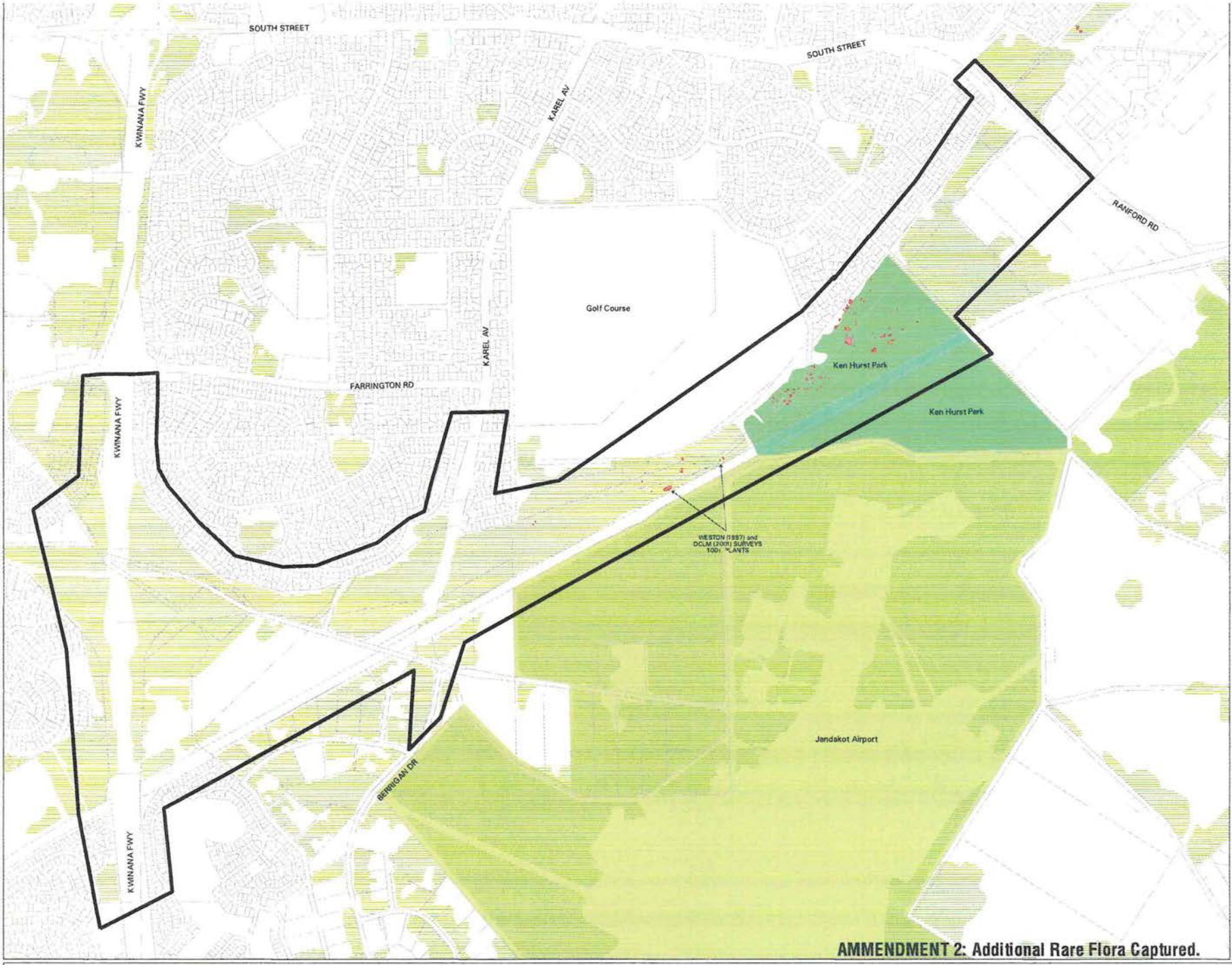
The greater part of the proposed alignment still supports native vegetation, with most being in a "very good" to "pristine" condition when assessed using the condition rating scale from the Bush Forever Studies. The vegetation is almost exclusively Banksia Woodland with a small area of mixed Melaleuca and Banksia woodland just east of Karel Avenue. Remnant bushland adjacent to the road reserve also contains this lower lying Banksia Woodland and an Open Heath Community in depressions where the water table is closer to the surface.

None of the floristic communities currently recognised as being rare or threatened occur inside the project area. The Banksia Woodland inside the road reserve has been interpreted from recent survey to represent Central *Banksia attenuata – Banksia menziesii* Woodlands (Floristic Community Type 23a of Gibson et al.). This community type is considered to be well reserved on the Swan Coastal Plain, and is also present in the adjacent Ken Hurst Park and the bushland around the Jandakot Airport to the south of the alignment.

A discussion of the reservation status of this community type will be given in the PER. The recent survey of the vegetation (BSD 2003), along with previous survey results, and the input of the local community are considered to provide adequate information on the vegetation. Assessment of the project impacts in the PER will be based on this information.

Two independent and recent surveys for dieback disease along the highway alignment and in adjacent bush indicate that the area around the South Street intersection with the road reserve, and a small area just west of this are infected with *Phytophthora cinnamomi.* Around Karel Avenue, where the vegetation has been cleared or substantially disturbed, the disease status has been deemed to be "uninterpretable".

The PER will present broad strategies for management of the dieback issue during and after construction.



LEGEND

BUSH FOREVER SITES
- BF_SITES No. 245
- BF_SITES No. 388

REMNANT BUSH AREA

RARE FLORA
- SITES

CADASTRE
- Cadastre Boundary

ROE HWY STUDY AREA (Stage 7)
- Limit of Study Area
- Alignment Investigation

AMMENDMENT 2: Additional Rare Flora Captured.

MAIN ROADS
Western Australia

GDA

ASSET AND NETWORK INFORMATION

Planning and Practice Directorate
Project: 30021 (E5864)
Data Sources: DPI
Data Conversion: VARIOUS
Dwg. No: GIS 02300298-02
Date of Print: 23 July 2003

DRAFT

NOTE: This drawing shall be treated as preliminary when stamped 'DRAFT'

1 : 7500

VEGETATION BASE MAP

ROE HIGHWAY - STAGE 7
SOUTH STREET to KWINANA FREEWAY

Fig. 4.1

4.2.2 Flora including weedy species

The most recent survey of the highway alignment and adjacent bush has identified 170 taxa from 46 families of vascular flora as being present. This included 32 introduced, or weedy species of which the grasses were most prevalent.

One declared plant (under the Agriculture and Related Resources Protection Act) has previously been found on the highway reserve. This is Skeleton Weed (*Chondrilla juncea*). The infestation is small and confined to a disturbed area near South Street. It is routinely monitored and treated by Agriculture WA officers. Main Roads is liaising with these officers to ensure that best practice management of the infestation occurs.

An outline of weed management strategies for the construction and rehabilitation periods will be presented in the PER.

4.2.3 Declared Rare Flora (DRF) and Priority Flora

Previous surveys of the Roe Highway corridor and of the adjacent powerline easement identified one species of DRF (*Caladenia huegellii* – Grand Spider Orchid) and one Priority 2 Species (*Lysinema elegans*). The latter species is no longer listed on the Priority Species lists, as extensive survey work has indicated that the species is not under threat.

The Declared Rare Flora species *Caladenia huegelii* was known from a survey of a powerline easement along the railway, south of the Roe Highway reserve (Weston 1997). The plants identified in this survey are all outside of the impact area for the project, however, after confirmation of the orchid on the highway reserve for the previous stage of the extension, it was considered prudent to survey a larger area for the species. This survey was carried out over several weeks in spring of 2002 (Hart Simpson and Associates 2002).

According to Department of Conservation and Land Management (DCLM) records, *C. huegelii* is regarded as Critically Endangered and is known from small populations (typically of a few plants) between Wanneroo and Capel. DCLM records show that it is known from 35 populations (45 subpopulations) of which 12 subpopulations are considered to be extinct. Official records (prior to the current surveys on the Roe Highway alignment and adjacent areas) indicate that there are a total of 169 plants extant.

Recent surveys for *C. huegellii* have shown that the species is quite widely distributed in the highway corridor and adjacent bushland, and is not restricted to the powerline easement as previously indicated. These surveys resulted in the positive identification of more than 350 individuals not previously officially recorded in the area.

Although these surveys have added substantially to the numbers of plants recorded, the species would still have to be considered as one of the rarest plants in the Western Australian flora.

The impact assessment to be provided in the PER will be comprehensive, and will be based on the results of the 2002 surveys. Detailed plans of the location of individual plants will be presented, as professional surveyors have accurately located all the plants identified in 2002.

Avoidance, management and mitigation proposals with respect to the DRF will be put forward in the PER. (NOTE: There is no presumption made that permission to take the DRF will be granted).

Recent survey has identified *Calectasia cyanea*, a Priority 2 species on the DCLM list of Priority Flora as also being present in the bushland along the alignment. A discussion of the

significance of this species and management and mitigation proposals will also be included in the PER.

4.2.4 Bush Forever Sites

Ken Hurst Park, a bushland reserve vested in the City of Melville, is situated adjacent to the road reserve and is included in the Western Australian State Government Bush Forever initiative for the protection and management of Regionally Significant remnant bushland. The Bush Forever initiatives aim to provide a comprehensive and adequate representation of the original biodiversity of the Swan Coastal Plain portion of the Perth Metropolitan Region.

The boundary of Bush Forever Site 245 (Ken Hurst Park) includes some of the vegetation on the Roe Highway reserve where it adjoins the Park. However, the Bush Forever Site Implementation Guidelines and Practice Notes recognise that the primary purpose of road reserves identified in the Metropolitan Region Scheme or local Town Planning Schemes is to accommodate vital transport infrastructure, and that the construction authority has the right to undertake the required works for transport and associated infrastructure. The guidelines and actions set out in Bush Forever Practice Note 18 (Road and Railway Reserves) will be addressed in the PER.

4.2.5 Fauna

Three species of recognised conservation significance have been recorded in the bushland around the highway alignment. These are:

1. Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) which is listed on Schedule 1 of the Western Australian Wildlife Conservation Act, and also under the Commonwealth EPBC Act as endangered;
2. Quenda (*Isoodon obesulus*) which is listed by the Department of Conservation and Land Management as being conservation dependant, and
3. Brush Wallaby (*Macropus irma*) also recognised as being conservation dependant.

Extrapolating from studies conducted in the nearby Jandakot Airport bushland and from the adjacent Ken Hurst Park, it is likely that the project area supports a rich fauna (Bamford 2003). The impacts of the project, and in particular the loss of habitat for all of the fauna identified in the area will be addressed in the PER.

Of particular concern for the project is evidence that Kangaroos currently cross the highway alignment on a regular basis. The animals travel between Ken Hurst Park (and the nearby Jandakot Airport precinct) south of the Highway alignment, and the Melville Glades Golf course and the old Melville tip site to the north. This movement by the Kangaroos, and their presence on the golf course has been identified by the City of Melville as being important to the local community. The question of maintaining access for- versus isolation and management of the population, which currently utilises the areas north of the Highway alignment, will be addressed in the PER.

4.3 Social

4.3.1 Land Use

Land uses in the immediate vicinity of the highway alignment include:

Residential – Residential areas are restricted to the northern side of the road reserve for part of its length, and are also close to the interchange with Kwinana Freeway (on the west of the Freeway);

Active Recreation – The City of Melville's sports and recreation precinct which includes both developed and future development areas is situated on the north of the road reserve. This includes the Melville Glades Golf Course, playing fields and some passive recreation areas.

Parks and Reserves – Ken Hurst Park abuts the highway reserve on the southern side.

Industrial and/or Commercial – The southeastern sector of the intersection of South Street with the Roe Highway is partially developed to various industrial uses. Future development of this area is also planned.

Transport, Power Supply and other Linear Infrastructure – For part of the alignment, the road reserve runs alongside the Welshpool to Kwinana freight railway line, and an existing powerline easement. A high-pressure gas pipeline occurs between the powerline and the freight railway, running parallel to the railway. At the closest point the pipeline is 40 –50 metres from the edge of the road reserve, and will be even further removed from any proposed works. A storage and training facility for Western Power is situated close to the alignment near the Kwinana Freeway interchange area.

4.3.2 Residential Amenity

The proposed alignment runs close to existing residences for part of its length. Noise studies conducted in 1998 have recently been revisited (Herring Storer Acoustics 2003). Measured noise levels reflect the fact that there is a large amount of undeveloped land in the vicinity, but also show that noise from the industrial areas, the freight railway and the airport already influence ambient levels, especially at night. Noise level modeling and the strategies for minimising the future impacts on adjacent areas will be set out in the PER. The highway extension could result in some deterioration in air quality for residents closest to the alignment. This will be investigated and reported in the PER.

The local community value the adjacent bushland, and have enjoyed immediate access to the section of Ken Hurst Park that is north of the freight railway line. The bushland also lends a rural flavour to the residential areas closest to the alignment. Public access to Ken Hurst Park and provision of pedestrian and cyclist facilities associated with the Highway will be addressed in the PER.

4.3.3 Aboriginal Heritage

Previous surveys and consultation with the Aboriginal Community found that there is a single site, which might possibly be impacted by the proposed extension. This is an archaeological site previously registered on the Western Australian Aboriginal Site register. It is an artefact scatter (DIA 4361 (S00773), situated to the south of Hope Road and immediately north of the freight railway crossing. It has been subject to total surface collection, and is thus only of academic interest to the project.

Previous consultation with the Aboriginal Community resulted in requests for information on the project to be circulated to them as planning progressed. This will be done as the final design for the project proceeds. Aboriginal Heritage is not considered to be a constraint on planning or design of the project, and will only be addressed in the PER as part of the commitments for management of construction activities.

4.3.4 European Heritage

Approximately 120 hectares of remnant bushland on the northern side of Jandakot Airport and including the area of the road reserve has been nominated and entered into the database of the

Australian Heritage Commission, and is thus known as an "indicative" place as far as Australian heritage is concerned. The status of "indicative" place means that the Heritage Commission has yet to make a decision on whether or not the bushland should be included on the Register of the National Estate.

The Statement of Nomination sets out the reasons for which the area is considered significant. These reasons all deal with the natural values of the place, including a rich flora and fauna, rare plants and the poor conservation status of Banksia Woodland on the Swan Coastal Plain. These issues will be dealt with in the PER in the sections on clearing, rare flora, and fauna impacts.

No other places either constructed, or natural in the road reserve have been identified to have any heritage significance.

4.3.5 Site Contamination

The now closed and partly rehabilitated Melville landfill site is situated north of, and adjacent to, the proposed alignment. It is on this old landfill site that the City of Melville is progressively developing both active and passive recreation areas.

Concept planning for the highway extension has aligned the carriageways on the northern side of the road reserve in order to minimise impacts on the population of Declared Rare Flora. This planning has indicated that it will be possible to construct the highway without interfering in any way with the old landfill or its protective clean earth cover. During the final design period, the exact limits of the landfill area will be confirmed in consultation with the City of Melville and by test pitting if necessary. It is the aim of the project to avoid any disturbance to the landfill, and the final design will be undertaken with this in mind.

As far as any possible ground water contamination from the old landfill is concerned, the following facts apply to construction of the highway and as a result there are no interfaces between the project and any possible contamination that may be present.

1. In the vicinity of the old landfill site most of the construction will be on fill. Minor excavation may be required for construction of a large underpass for fauna, or to ensure an appropriate vertical alignment, but not to the depth of the maximum water table level.

2. The general direction of groundwater flow in the area of the landfill site is west-north-west which is along the alignment, or slightly away from it towards the landfill site itself.

No other areas of contamination occur along the alignment. With the exception of avoidance of the old landfill mentioned above, site contamination is thus not considered to be a constraint on the design or construction of the highway extension. The PER will touch on the issue only as far as commitments to best practice management of construction are concerned.

5. KEY ENVIRONMENTAL ISSUES

Table 5.1 sets out a summary of the issues that are considered to be significant in the assessment of environmental impacts of the project. These are the clearing of a significant area of native vegetation, impacts on a population of Declared Rare Flora, residential amenity, impacts on Bush Forever Site (Ken Hurst Park), potential impacts on resident and transient fauna populations, and proximity to the Underground Water Pollution Control Area. The table also includes reference to the EPA's objectives in relation to the issues, the specific project objectives, impacts, and broad management strategies. All of these issues, impacts and strategies will be developed in the PER. Where there is a relevant Position or Guidance

Statement from the EPA regarding any aspect of the significant issues, the assessment presented in the PER will be consistent with these position or guidance statements.

Issue 2 (Impacts on Rare Flora) and issue 5 (Impacts on Rare Fauna) are to be assessed under the Commonwealth EPBC Act. The PER will include a comprehensive assessment of any impacts of the proposal on listed threatened species and communities. In addition to listed fauna and flora species identified under the EPBC Act in the referral process, any new listed fauna and flora species identified during the PER investigations that are protected under the EPBC Act will be addressed in the PER.

Table 5.1 Key Environmental Issues

ENVIRONMENTAL ISSUE & RELEVANT FACTORS	CONTEXT	ENVIRONMENTAL OBJECTIVES	POTENTIAL IMPACTS	STUDIES AND INVESTIGATIONS	MANAGEMENT / MITIGATION
1. Clearing of Native Vegetation • *Land* • *Biodiversity* • *Flora* • *Pests and diseases*	The alignment supports mostly intact Banksia Woodland on Bassendean Sands The predominant community type has been inferred to be Floristic Community Type 23a which is well reserved in the region	EPA Objectives: • Maintain the abundance, species diversity, geographic distribution and productivity of vegetation. Project Objectives: • Minimise the extent of clearing required for the project through design and rigorous management of construction activities • Mitigate for the loss of significant vegetation	Clearing of approximately 32 hectares of Banksia Woodland mostly in good condition	Flora and Vegetation surveys were conducted along the alignment during the Master Planning for the project in 1998/1999. The vegetation on the road reserve and adjacent areas has recently (2002) been resurveyed and mapped. Impact assessment will be based primarily on the 2002 survey, which was consistent with the methodology suggested in the EPA's Draft Guidance Statement 51.	• Work with design engineers to limit the footprint of the works. • Ensure that best practice control and monitoring is in place during clearing for the project. • Identify, evaluate and commit to mitigation options An outline management plan for clearing operations will be included in the PER
2. Impacts on Declared Rare Flora • *Biodiversity* • *Flora* • *Surface Water Quality*	The central portion of the proposed alignment and surrounding bushland supports the largest known concentration of the rare Grand Spider Orchid (*Caladenia huegelii*) The Priority Flora (*Calectasia cyanea*), a Priority Two species was also found in the survey area.	EPA Objectives: • Protect Declared Rare and Priority Flora, consistent with the provisions of the *Wildlife Conservation Act 1950*, and the *Environment Protection and Biodiversity Act 1999*. • Protect other flora of conservation significance. Project Objectives: • Minimise the impact on the significant flora species through design	Preliminary estimates (using the extent of the footprint of the existing concept design) indicate that approximately 90 out of a total local population of around 500 plants will be directly impacted. Prior to the final design and a detailed survey of the distribution of *Calectasia cyanea*, the exact impact on this species is not known.	The road reserve and surrounding bushland was surveyed in detail for the DRF in the Spring of 2002. It is on the basis of the mapping from this survey that the estimate of the impact of the project is based. The survey will be repeated and every plant found marked during Spring of 2003 in order to assist with final design, to confirm impacts, and to prepare for transplantation of those plants that cannot be avoided.	• Ensure that the design of the project minimises the footprint of the works as much as is possible. • Work with the community, conservation groups and conservation scientists to provide the best protection for the remainder of the population and its habitat. • Through consultation with conservation specialists, investigate translocation methodology and potential receiver sites,

ENVIRONMENTAL ISSUE & RELEVANT FACTORS	CONTEXT	ENVIRONMENTAL OBJECTIVES	POTENTIAL IMPACTS	STUDIES AND INVESTIGATIONS	MANAGEMENT / MITIGATION
		and rigorous management of construction activities. • Mitigate for the impacts on the population of DRF. • Ensure protection of the remaining population and its habitat		Translocation methodology will be investigated with the aim to identify a methodology that ensures a loss percentage no greater than 50%. If a methodology cannot be identified that ensures such a success rate, then an alternative approach will be investigated.	so that translocation can be carried out. • Identify and evaluate other mitigation measures such as funding for research into species biology and propagation techniques. An outline rare and priority flora management plan will be included in the PER
3. Residential Amenity • *Noise* • *Light* • *Air Quality* • *Heritage* • *Risk* • *Visual Amenity* • *Recreation*	The proposed alignment runs close to existing residences (one side only) for part of its length. The local community value the adjacent bushland, and have enjoyed immediate access to part of Ken Hurst Park.	<u>EPA Objectives</u>: • Ensure that visual amenity of the area is not significantly affected by implementation of the proposal. • 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. • Ensure that gaseous emissions do not adversely affect the environment or health, welfare and amenity of nearby land users by meeting the statutory requirements (including	Construction of the highway extension will mean that a relatively quiet environment will be impacted by highway noise. There could be some impact on the air quality for nearby residents from exhaust emissions. Visual amenity is also a consideration, as is continued access across the highway to Ken Hurst Park. Construction activities may inconvenience local residents	Noise studies were carried out as part of the Master Planning for the project in 1997/1998. These studies have recently been revisited to take into account new estimates of future traffic volumes. These studies will form the basis for design of noise attenuation measures. Basic modelling to determine the impact on air quality in the immediate vicinity of the highway will be undertaken and reported as part of the PER studies.	• Design for noise attenuation measures where appropriate in order to afford adjacent residences with best practicable long-term protection from noise impacts. • Ensure that visual amenity and safety are integral to the design process. • Provide a grade separated crossing so that the local community retains access to Ken Hurst Park. • Address construction period impacts through best practice management methods A noise management plan will be prepared during the final design phase of the

ENVIRONMENTAL ISSUE & RELEVANT FACTORS	CONTEXT	ENVIRONMENTAL OBJECTIVES	POTENTIAL IMPACTS	STUDIES AND INVESTIGATIONS	MANAGEMENT / MITIGATION
		requirements (including Section 51 of the Environmental Protection Act 1986) and acceptable standards. Project Objectives: • Ensure that the amenity of adjacent residential areas is not significantly impacted by either noise from construction or from operation of the highway. • Ensure that the safety of residents is taken into account in provision of cycling and walking facilities. • Minimise the visual impact of the project through appropriate landscaping and / or screening. • Provide access to Ken Hurst Park from the residential areas on the north of the highway.			project, when alignment (horisontal and vertical) details are known. Approval for the noise management plan will be sought at that time.
4. Impact on Bush Forever Site (Ken Hurst Park) • *Land* • *Biodiversity* • *Conservation Areas* • *Access*	Part of Bush Forever Site 245 (Ken Hurst Park) extends into the gazetted road reserve where it adjoins the Park.	EPA Objectives: • Ensure that regionally significant flora and vegetation communities in Bush Forever sites are adequately protected.	Clearing of some of the vegetation mapped as part of the Bush Forever Site	N/A	• Limit the footprint of the works and ensure that clearing is according to best practice, and is strictly monitored. Consult with City of Melville and Friends of Ken Hurst Park to provide appropriate

ENVIRONMENTAL ISSUE & RELEVANT FACTORS	CONTEXT	ENVIRONMENTAL OBJECTIVES	POTENTIAL IMPACTS	STUDIES AND INVESTIGATIONS	MANAGEMENT / MITIGATION
		Project Objectives: • Minimise the impacts on Ken Hurst Park. • Ensure that the integrity of the remainder of the Park is protected and possibly enhanced.			fencing which will maximise the extent and protection of the Park.
5. Potential Impacts on Rare Fauna and Impacts on local macro-Fauna populations • *Biodiversity* • *Fauna*	Carnaby's Black Cockatoo is known to visit local bushland on a seasonal basis. The Cockatoo is a Schedule 1 Species under the WA Wildlife Conservation Act, and is listed as endangered under the EPBC Act. The Western Brush Wallaby and the Southern Brown Bandicoot (Quenda) have both been recorded from the highway alignment and adjacent Ken Hurst Park. These animals are both listed as Priority 4 taxa (not currently endangered, but in need of monitoring). There is evidence that kangaroos currently cross the highway alignment on a regular basis traveling between Ken Hurst Park and the nearby Jandakot Airport precinct to the Melville Glades Golf course and the old Melville tip site.	EPA Objectives: • Maintain the species abundance, diversity and geographical distribution of fauna • Protect Specially Protected (Threatened) Fauna and Priority Fauna species and their habitats, consistent with the provisions of the *Wildlife Conservation Act 1950* and the *Environment Protection and Biodiversity Conservation Act 1999.* Project Objectives: • 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 the Department of Conservation and Land	Loss of habitat for all fauna species, including those considered rare, endangered or in need of management under both State and Commonwealth legislation. Part of the local kangaroo population could become isolated on the Golf Course during construction. Without proper barriers, the kangaroos may continue to migrate across the highway after it is opened to traffic.	Assessment will be based on the previous fauna study for Ken Hurst Park, and on a review (Bamford 2003) of fauna populations in the road reserve and adjacent bush. This study drew on the author's extensive experience of the Jandakot bushland, just south of the proposed alignment Investigate and implement strategies for providing additional feeding habitat for Carnaby's Cockatoo in the vicinity of the project. Investigate a viable methodology consistent with the Environmental Objectives to "minimise impacts on the threatened fauna species" for the establishment of compensatory feeding habitat for the Carnaby's Black Cockatoo in the vicinity of the project. This investigation will use as the viability criteria for acceptance of the chosen methodology, factors such	• Consult with the City of Melville in order to determine whether it may be possible to maintain a population of kangaroos on the Golf Course. • Investigate the viability of providing a dedicated underpass for the kangaroos and other fauna. • Provide appropriate fencing along the highway in consultation with the Department of Conservation and Land Management. A fauna management plan will be prepared during the final design phase of the project when details of the alignment are known. Approval for the fauna management plan will be sought at that time. A viable mitigation measure for compensatory feeding habitat establishment will be

ENVIRONMENTAL ISSUE & RELEVANT FACTORS	CONTEXT	ENVIRONMENTAL OBJECTIVES	POTENTIAL IMPACTS	STUDIES AND INVESTIGATIONS	MANAGEMENT / MITIGATION
		Management.		as: • connectiveness of a potential site to existing feeding habitat; • viability of access to breeding stock/seeds of suitable flora species; access and availability of expertise for propagation; • weed control program; • need for continuing monitoring; and • long term tenure of a potential site.	identified from the investigation undertaken using criteria for selection that are consistent with the stated Environmental Objectives to "minimise impacts on the threatened fauna species.
6. Proximity of Underground Water Pollution Control Area • *Land* • *Water* • *Water Quality*	The Jandakot UWPCA (Priority One area) is situated adjacent to the highway reserve at the western end. The highway reserve traverses a Priority Three source protection area.	<u>EPA Objectives</u>: Surface Water Quality • Ensure that the beneficial uses of surface water can be maintained, consistent with the draft WA Guidelines for Fresh and Marine Waters (EPA, 1993). Groundwater Quality • Maintain the quantity of groundwater so that existing and potential uses, including ecosystem maintenance, are protected. • Ensure that groundwater resources used for public water supply are protected in accordance	Possible pollution incident resulting from an accident on the freeway. On going low-level contamination from road reserve runoff.	A drainage design strategy has been proposed after consultation with the Water and Rivers Commission. This strategy will be evaluated against a risk analysis for pollution from the highway.	• Implement best practice design to minimise the risk of pollution. A drainage management strategy will be included in the PER. Approval of final drainage design will be sought when final design is complete.

ENVIRONMENTAL ISSUE & RELEVANT FACTORS	CONTEXT	ENVIRONMENTAL OBJECTIVES	POTENTIAL IMPACTS	STUDIES AND INVESTIGATIONS	MANAGEMENT / MITIGATION
		with NHMRC guidelines and that land uses which could affect both the quantity and quality of groundwater are appropriately controlled. <u>Project Objectives</u>: • Ensure no adverse impacts on the quality of the underground water supply			

6. STAKEHOLDER CONSULTATION PROGRAMME

In February 2002, Main Roads developed a consultation strategy designed to identify, address where possible, and integrate the socio-environmental needs of the local community in the planning for the highway extension. The strategy was developed in accordance with the Department of Premier and Cabinet Citizens and Civic Unit's guidelines.

Through public advertising, Main Roads called for community members and groups to nominate for the Roe Highway Stage 7 Project Representative Group (PRG). The group comprises local residents and representatives of Local Government, the Friends of Ken Hurst Park, the Conservation Council, and the Wildflower Society. The group has met formally on four occasions, and have organised their own informal meetings as well. Further meetings are scheduled prior to the release of the PER for public comment.

Strategies, suggestions, information and concerns put forward by the group are being analysed and considered in good faith by Main Roads within the Project's socio-environmental, technical and financial constraints.

The major concerns raised by the PRG are:

- Whether the correct decision on alignment has been made;
- Reducing the footprint of the works;
- Impacts on Declared Rare Flora;
- Fauna facilities;
- Possibility of tunneling as a means of construction;
- Proximity of the highway to houses and associated impacts of noise and other disturbance;
- Planning shared path links to local networks;
- Safety and proximity issues associated with the ramps on and off Kwinana Freeway;
- Traffic management and impacts on local roads;
- Aesthetics and the quality of design for structures;
- Fencing (security, fauna, Ken Hurst Park boundary);
- Noise attenuation;
- Drainage design and potential pollution impacts;
- Construction working hours;
- Dieback management;
- Fire control;
- Site contamination, and
- Co-ordination with other projects

It is anticipated that the PRG will continue to contribute to the project through working with the Project Alliance when that is in place.

Main Roads has also consulted separately with:

- The three Local Government Authorities whose jurisdictions abut the highway alignment;
- The Water and Rivers Commission;
- The Friends of Ken Hurst Park;
- Department of Conservation and Land Management.

Consultation and negotiation with these authorities will continue throughout the preparation of the PER, as well as during final design and construction.

7. PUBLIC ENVIRONMENTAL REVIEW

Preparation of the Public Environmental Review (PER) will be based on the existing studies, advice from external stakeholders and the outcomes of consultation with the community. It will address the key issues set out in Section 5 above, in detail, and will expand on the management and mitigation strategies that have been put forward.

Other issues such as the construction period impacts will also be addressed, and management actions put forward.

The PER will also commit to further investigations whose timing is season dependant, such as further survey and marking of the population of *Caladenia huegelii*, or work which can only be carried out in conjunction with the final design of the project.

8. APPLICABLE LEGISLATION

State Acts

Aboriginal Heritage Act 1988
Agriculture and Related Resources Protection Act 1976
Conservation and Land Management Act 1984
Environmental Protection Act 1986
Heritage of Western Australia Act 1990 (WA)
Land Administration Act 1997
Local Government Act 1985
Main Roads Act 1930 (WA)
Metropolitan Region Scheme (Metropolitan Region Town Planning Scheme Act 1959 (WA))
Mining Act 1978
National Trust of Australia (Western Australia) Act 1964
Soil and Land Conservation Act 1988 (WA)
Town Planning and Development Act 1928 (WA)
Water Authority Act 1984
Wildlife Conservation Act 1950 (WA)

Commonwealth Acts

Aboriginal Heritage Act 1972
Environment Protection and Biodiversity Conservation Act 1999
Explosives and Dangerous Goods Act (refer State Mining Act)
Freedom of Information Act 1992
Native Title Act 1993

9. PROJECT AND ASSESSMENT SCHEDULE

Table 9.1 Project and Environmental Assessment Milestones

DATE	ENVIRONMENTAL ASSESSMENT MILESTONE	PROJECT MANAGEMENT AND DESIGN MILESTONE
7 April 03		Project Representative Group Meeting 1
16 April 03		Industry Briefing
5 May 03		Project Representative Group Meeting 2
22 May 03	Draft Scoping Doc to EPA Services Unit	
26 May 03		Project Representative Group Meeting 3

DATE	ENVIRONMENTAL ASSESSMENT MILESTONE	PROJECT MANAGEMENT AND DESIGN MILESTONE
16 June 03	EPA Services Unit comment on draft scoping document (first round)	
23 June 03		Project Representative Group Meeting 4
1 July 03	EA comment on draft scoping document (first round)	
23 July 03	Final scoping document to EPA services unit	
31 July 03	Scoping document presented to EPA for endorsement	
1 Aug 03		Select Project Alliance Partner
11 Aug 03		Project Representative Group Meeting 5
15 Aug 03	Draft PER to EPA Services Unit	
12 Sept 03	EPA services unit comment on draft PER	
19 Sept 03	Submit revised PER for release	
30 Sept 03	Release PER for public comment	
6 Oct 03		Preliminary design complete
25 Nov 03	Public comment period closes	
5 Dec 03	Summarise & respond to public submissions	
30 Jan 04	EPA Assessment and release of Bulletin	
27 Feb 04	Appeals resolved	
26 Mar 04	Ministerial Statement (State and Commonwealth)	
April 04		Construction commences
Oct 05		Project complete

10. STUDY TEAM AND REVIEW

The draft Public Environmental Review (PER) will be compiled by Main Roads Western Australia with advice from Dinky Goble-Garratt (Environmental Consultant to the Major Projects Directorate at Main Roads). Finalisation of the PER will be through the Project Alliance Team comprising representatives from Main Roads and Civil Contractor (and Consultants) who is appointed as the Alliance Partner. The PER will be based on all available information (See Section 11 below), including input form external stakeholders and the Project Representative Group.

Advice will be sought from the specialists previously involved in studies of the highway alignment throughout the preparation of the PER. The EPA Services Unit will be consulted regarding the need for further external review prior to the public release of the document.

11. EXISTING STUDIES AND OTHER REFERENCES

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