

Proposal to subdivide Jandakot AA lots 122, 123 and 403 Acourt Rd, Canning Vale

Canning Property Group

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

**Environmental Protection Authority
Perth, Western Australia
Bulletin 745
July 1994**

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THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposal.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's report.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposal may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

APPEALS

If you disagree with any of the contents of the assessment report or recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of \$10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

ADDRESS

Hon Minister for the Environment
12th Floor, Dumas House
2 Havelock Street
WEST PERTH WA 6005

CLOSING DATE

Your appeal (with the \$10 fee) must reach the Minister's office no later than 5.00 pm on 29 July, 1994.

Environmental Impact Assessment (EIA) Process Timelines in weeks

Date	Timeline commences from receipt of full details of proposal by proponent	Time (weeks)
10.1.94	Proponent Document Released for Public Comment	4
7.2.94	Public Comment Period Closed	
14.2.94	Issues Raised During Public Comment Period Summarised by EPA and Forwarded to the Proponent	1
12.5.94	Proponent response to the issues raised received	12
13.7.94	EPA reported to the Minister for the Environment	8

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Summary and recommendation

The Canning Property Group proposes to partly develop for residential purposes Lots 122, 123 and 403 Acourt Road, Canning Vale, with the remaining portion being given up for inclusion in the Jandakot Botanic Park.

In April 1993 the proponent submitted a subdivision application to the Department of Planning and Urban Development, which was refused by the State Planning Commission (SPC) in August 1993, a decision supported by the City of Canning. This property has been included in a proposed Amendment to the Metropolitan Region Scheme known as South West Corridor (Stage A) Amendment. The Amendment would rezone this site from the Rural zone to the Parks and Recreation Reserve as the first step for its inclusion in the Jandakot Botanic Park.

The Canning Property Group proposal was referred to the Environmental Protection Authority (EPA) in May 1993 where it was determined that the potential environmental impacts should be addressed within a Consultative Environmental Review.

The major environmental issues related to this proposal are:

- *the conservation of regionally significant upland and wetlands vegetation;*
- *impact on wetlands;*
- *noise from both the Jandakot Airport and nearby kennel zone; and*
- *protection of groundwater resources.*

The vegetation on the northern part of the property is classified as Bassendean-Central and South and the southern part of the property supports vegetation of the Southern River complex. These vegetation complexes have been extensively cleared on the Swan Coastal Plain and it has been estimated that less than 5% of their original distribution is remaining (Bowman Bishaw and Gorham, 1994).

The site contains a wetland area which ranges in condition from near pristine in the west of the site, to partly degraded in the south. This proposal would cede the wetland area to the Crown for inclusion in the Jandakot Botanical Park. However, the clearing of the native vegetation on the upland portion of the site to accommodate development would likely cause the local water table to rise, which in turn would likely impact on this wetland area. Impacts would likely include: increased water levels, increased duration of inundation where surface water occurs, a larger area of wetland becoming inundated, and changes to the wetland vegetation structure due to changed water regimes. It is also proposed to modify a portion of the wetland area to provide a stormwater basin.

The vegetation on the site provides a suitable habitat for the Southern Brown Bandicoot, a Declared Rare Fauna species.

The development of the property has the potential to impact upon the groundwater resource and the quality of water drawn for public purposes from Water Authority of Western Australia bore J120 located on the eastern boundary of the property. Water Authority Bylaws require a 300m wellhead protection zone around Water Authority bores. The proposal as assessed by the Environmental Protection Authority does not comply with this requirement and would need to be modified accordingly.

The property is subject to the Environmental Protection Authority's Draft Environmental Protection (Jandakot Groundwater) Policy 1993 and the Water Authority's Catchment Protection Policy on the Jandakot Underground Water Pollution Control Area. These policies seek to restrict development that has the potential to reduce the quality of groundwater within the Public Water Supply areas, but do not specifically prohibit urban development. This site is within Area B as defined in the Draft Environmental Protection (Jandakot Groundwater) Policy 1993 and Priority 2 as defined in the Water Authority's Catchment Protection Policy on the Jandakot Underground Water Pollution Control Area.

The Environmental Protection Authority is currently reviewing the Draft Environmental Protection (Jandakot Groundwater) Policy, and one matter under consideration is making the

Areas A and B consistent with the Water Authority's Priority 2 and 3 areas. If this were to happen, this site would become Area A as defined in the Environmental Protection Policy where urban development would be considered unacceptable.

The issue of groundwater protection is also addressed in the Jandakot Land Use and Water Management Strategy and will be in the Select Committee Report on Residential Development and Groundwater which is due for release in November 1994.

Adjacent land uses have the potential to impact on the development. Noise from the Jandakot airport and nearby kennel zone could significantly affect future residents.

Submissions from the Water Authority of Western Australia, the Department of Conservation and Land Management and the Department of Planning and Urban Development opposed the development of the land for residential purposes. Specialist consultants provided information on the conservation value of the vegetation on the property, and the Conservation Council of Western Australia (Inc) and local conservation groups made submissions on the proposal. The Environmental Protection Authority took these views into consideration during the assessment process.

In assessing this proposal the Environmental Protection Authority concluded that should this site be included in the Jandakot Botanic Park as proposed in the Major Amendment for the South West Corridor (Stage A) currently under consideration by the planning agencies, the environmental issues associated with the Canning Property Group proposal would effectively be resolved. The Environmental Protection Authority supports the inclusion of this site in the Botanic Park and considers that it is not appropriate to complete the environmental assessment of this proposal until the MRS Amendment is finalised. Should the Minister for Planning resolve not to include this land or a portion of this land in the Jandakot Botanic Park, the Environmental Protection Authority will finalise its assessment and advises the Minister for the Environment accordingly.

Therefore, the Environmental Protection Authority recommends as follows:

Recommendation

The Environmental Protection Authority recommends that, in relation to the assessment of the environmental acceptability of the proposal to develop part of Lots 122, 123 and 403 Acourt Road Canning Vale for residential purposes:

- **the comments of the Environmental Protection Authority in the Bulletin be noted by the Planning Agencies;**
- **the assessment should not be completed until after the conclusion of the major Metropolitan Region Scheme Amendment for the South West Corridor (Stage A) process;**
- **the assessment should only be carried out in the event that the subject land is not reserved for "Parks and Recreation" in the Amendment as is currently proposed, in which case, the Environmental Protection Authority would report again to the Minister for the Environment.**

1. Introduction

The Canning Property Group proposes to partly develop for residential purposes Lots 122, 123 and 403 Acourt Road (Figure 1 and 2), Canning Vale, with the remaining portion being given up for inclusion in the Jandakot Botanic Park. The proposal is designed to provide residential land near existing infrastructure, set aside land for conservation and protect groundwater resources.

The property is subject to the Department of Planning and Urban Development's recent amendment to the Metropolitan Region Scheme - South West Corridor Amendment (Stage A). The Amendment would rezone this site from the Rural zone to the Parks and Recreation Reserve as the first step for its inclusion in the Jandakot Botanic Park. The State Planning Commission will then consider purchasing the land, in line with the Draft Urban Bushland Strategy (Department of Planning and Urban Development, 1994a).

The proposal was referred to the Environmental Protection Authority (EPA) in May 1993 where it was determined that the potential environmental impacts should be addressed within a Consultative Environmental Review.

Guidelines for the preparation of the Consultative Environmental Review (CER) document were issued by the Environmental Protection Authority in June 1993. The public comment period for the document closed on 7 February 1994, after a four week public review period.

2. The proposal

The proponent, Canning Property Group, propose to develop approximately 53 ha of the 92 ha land parcel for residential subdivision. The proposal seeks to create 440 residential lots ranging in size from 600m² to 3 000 m².

The high conservation value of the wetland area is recognised by the proponent and the balance of the land (38 ha) is proposed to be established as a conservation reserve.

The proponent has made a number of commitments (refer Appendix 4 for the revised list following consideration of submissions) to ensure protection of the wetland area, including the preparation of a management plan which commits the proponent to management of the area for a period of two years.

The area proposed as a conservation reserve is located on the eastern side of the property (see Figure 3), and would be ceded to the State Planning Commission for inclusion within the Jandakot Botanic Park.

3. Planning context

The land is currently zoned Rural under the Metropolitan Region Scheme. An application by the proponent to subdivide the land was lodged with the Department of Planning and Urban Development in April 1993. The subdivision application was not supported by the City of Canning and was refused by the State Planning Commission in August 1993.

The proponent appealed against the State Planning Commission refusal. The appeal was lodged with the Minister for Planning in October 1993 but a decision on that appeal has been deferred pending the outcome of the CER.

The land is subject to a major amendment to the Metropolitan Region Scheme, Amendment No 938/33 South-West Corridor (Stage A). This major amendment proposes to reserve the land for Parks and Recreation, which is the first stage in the establishment of the Jandakot Botanic Park (State Planning Commission, 1993).

The Environmental Protection Authority has made a submission to the State Planning Commission on this amendment. The submission supported the reservation of all proposed wetland and bushland areas and the implementation of the Jandakot Botanic Park.

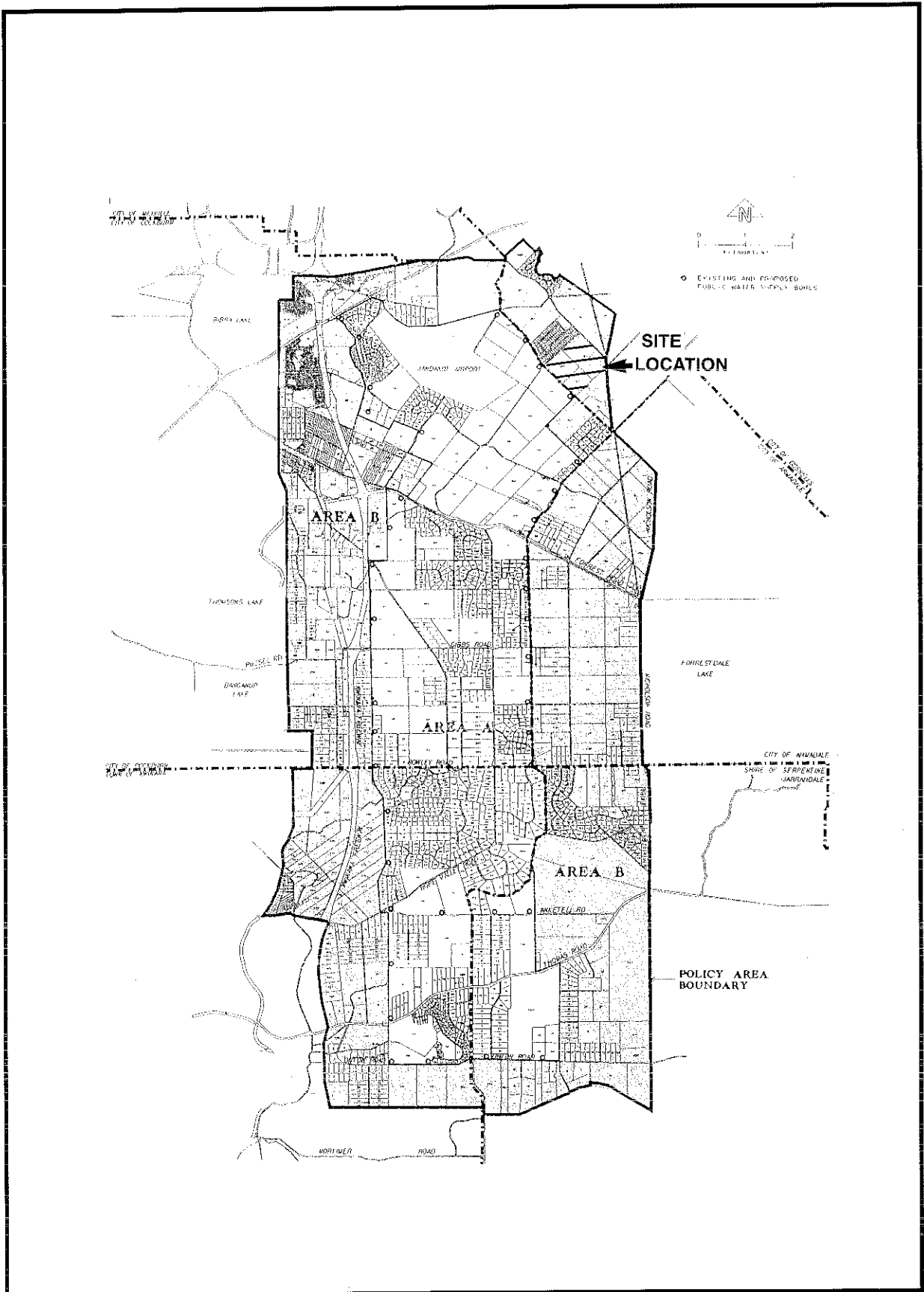


Figure 1. Location map showing land within the Draft Environmental Protection (Jandakot Groundwater) Policy area.

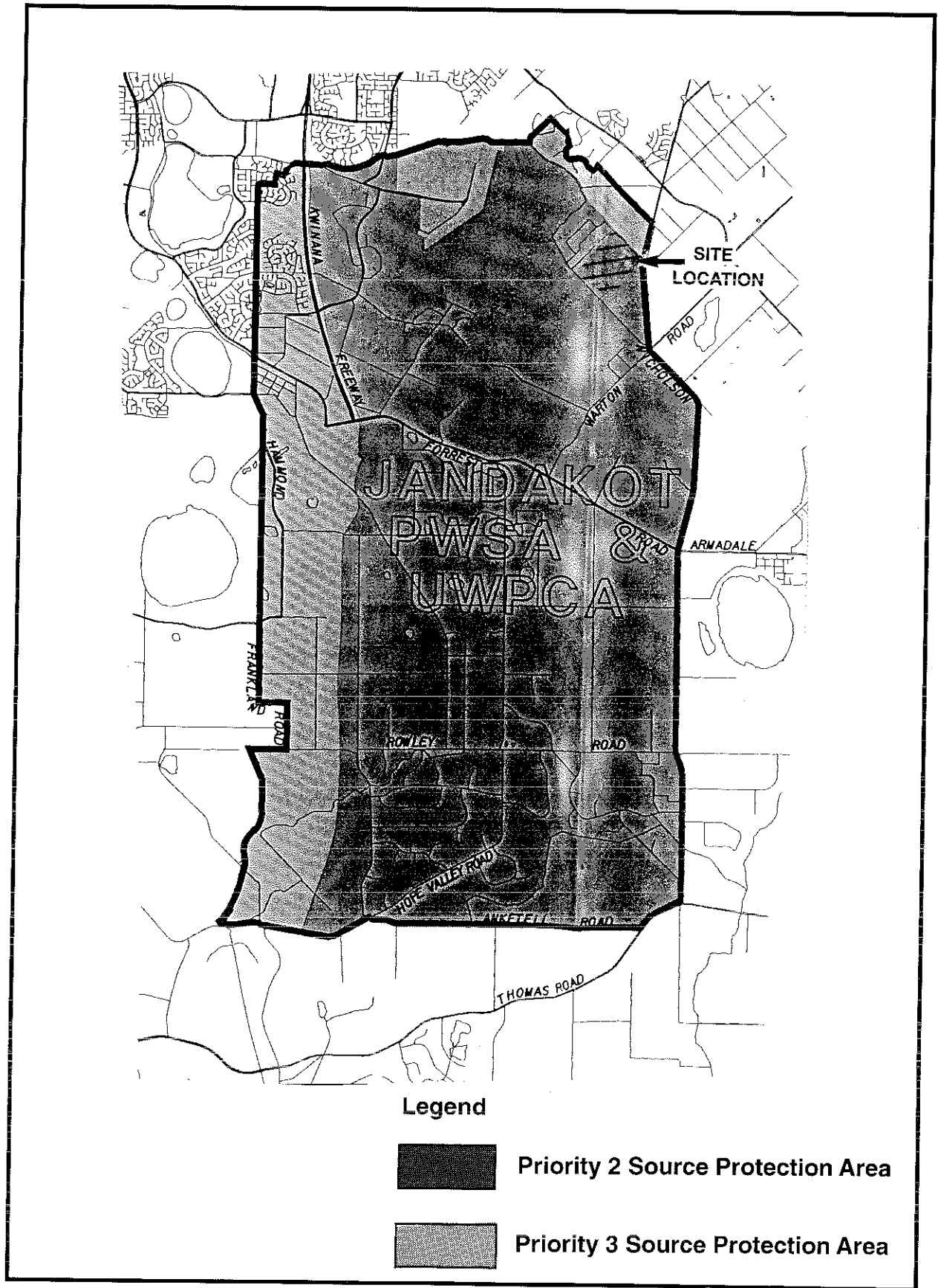


Figure 2. Location map showing land within the Water Authority's Jandakot Mound Underground Water Pollution Control Area.

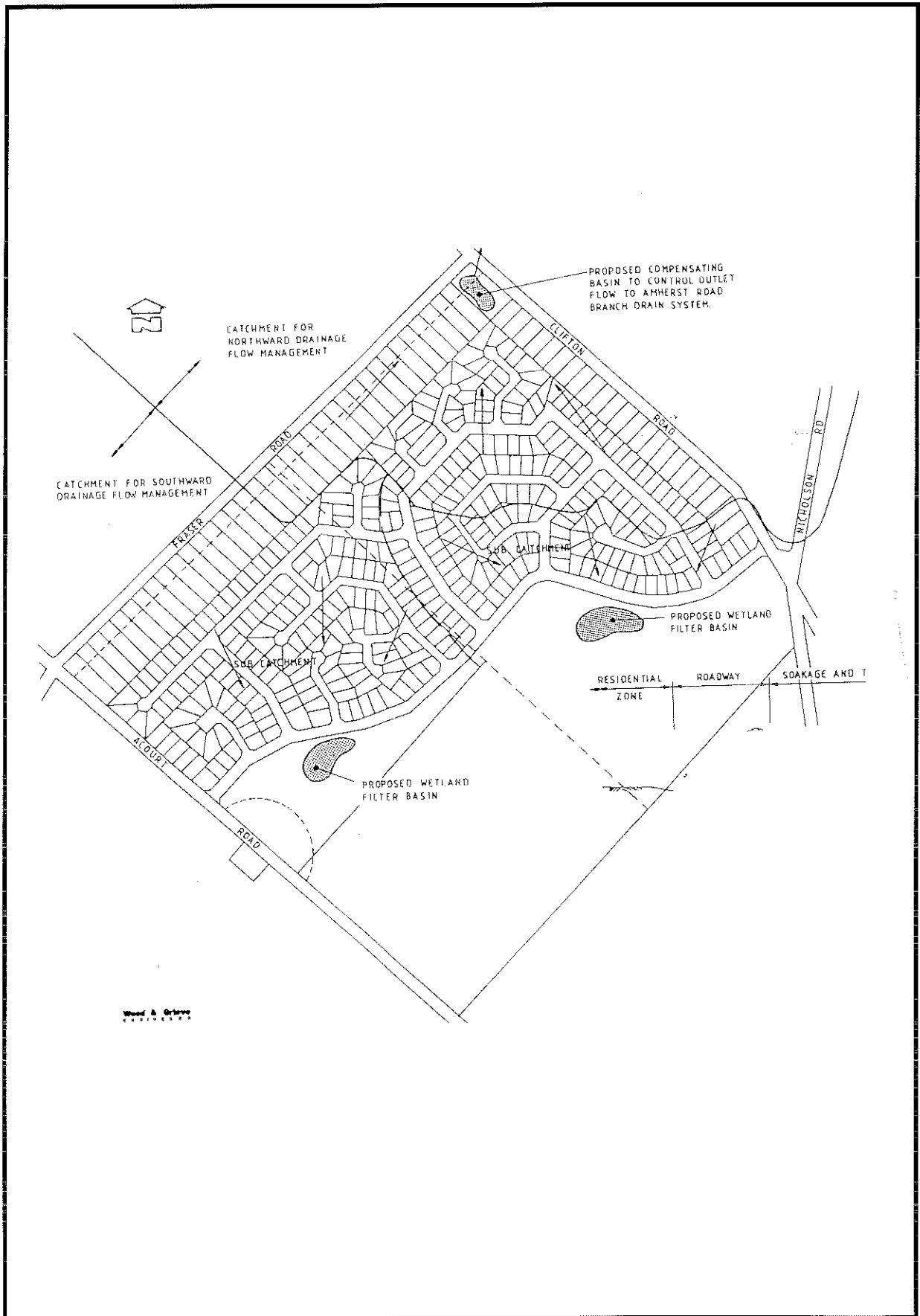


Figure 3. Plan of subdivision (from Wood & Grieve, CER).

4. Environmental impact assessment method

The environmental impact assessment for this proposal followed the environmental impact assessment administrative procedures 1993, as shown in the flow chart in Appendix 1. The summary of submissions and the proponents response to those submissions appears in Appendix 2, and a list of submitters appears as Appendix 3. The proponents revised commitments following the response to submissions appears in Appendix 4.

As part of the evaluation officers from the Department of Environmental Protection consulted with officers from the Department of Conservation and Land Management, the Department of Planning and Urban Development and the Water Authority of Western Australia, as well as the Conservation Council and various consultants. Several meetings with the proponent and the consultant were organised, as well as several on site inspections.

Limitation

This evaluation has been undertaken using information currently available. The information has been provided by the proponent through the preparation of the Environmental Review document (in response to guidelines issued by the Department of Environmental Protection), by Department of Environmental Protection officers utilising their own expertise and reference material, by utilising expertise and information from other State government agencies, and by contributions from Environmental Protection Authority members.

The Environmental Protection Authority recognises that further studies and research may affect the conclusions. Accordingly, the Environmental Protection Authority considers that if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should occur only following a new referral to the Environmental Protection Authority.

5. Evaluation

5.1 Overview

The major environmental issues related to this proposal which have been identified through the environmental impact assessment process include the following:

- the conservation of regionally significant upland and wetland vegetation;
- impact on wetlands;
- noise from both the Jandakot Airport and nearby kennel zone; and
- protection of groundwater resources.

5.2 Conservation of regionally significant upland and wetland vegetation

5.2.1 Issue

The property supports two vegetation types, as identified by Hedde et al (1980). The northern part of the property is classified as Bassendean Complex-Central and South, and the southern part of the property is part of Southern River complex. Both of these complexes have been extensively cleared on the Swan Coastal Plain, and any remaining vegetation of these classifications is recognised as having high conservation value.

The wetland area on the property is an integral part of the vegetation and supplements its value.

The property also provides habitat for a number of fauna species, including the Southern Brown Bandicoot (*Isodon obesulus*), which has been observed on the property (Goble-Garratt, 1993). This species is Gazetted Rare Fauna under the *Wildlife Conservation Act* (1950).

The Environmental Protection Authority normally recommends against developments which require the destruction of all or part of vegetation of highest conservation value.

5.2.2 Assessment framework

Technical/background information

1. General

The Bassendean-Central and South vegetation type ranges from woodland of jarrah-sheoak-*Banksia* on the sand dunes, to a low woodland of *Melaleuca* spp., and sedgelands on the low lying depressions and swamps. It has been estimated that only 5% of these *Banksia* woodlands remain, and of this, only 1.6% is represented in the reserve system (Bowman Bishaw and Gorham, 1994).

The Southern River complex has been extensively cleared as well, with approximately 5-7% remaining (Trudgen, 1994). This vegetation complex consists of an open-woodland of marri-jarrah-*Banksia* on the elevated areas and a fringing woodland of *Eucalyptus rudis* and *Melaleuca raphiophylla* around the wetland areas of the site.

2. Wetland

The Environmental Protection Authority has established a mechanism for determining the management objectives of wetlands of the Swan Coastal Plain near Perth (Environmental Protection Authority, 1993a, Bulletin 686). In summary, five management categories can be identified depending on a wetland's natural and human-use attributes. These management categories are:

- a wetland with high human-use and natural value is called a High Conservation wetland - category H;
- a wetland with a high natural value only is called a Conservation wetlands - category C;
- a wetland with high human-use value only is called a Conservation and Recreation wetlands - category O;
- a wetland with moderate human-use and natural values is called a Resource Enhancement wetlands - category R; and
- a wetland considered with low human-use and natural values is called a Multiple use wetlands - category M.

The CER identified two different zones within the wetland area, and these were evaluated separately (as recommended by Environmental Protection Authority Bulletin 686).

The wet heath area on the southern portion of the property was categorised as transitional between Category C and R, depending on the distribution of this vegetation type in the region. The open peaty area at the western end of the survey site which is seasonally inundated is considered to be a Category H wetland due to the presence of Declared Rare Fauna, the Southern Brown Bandicoot.

3. Habitat for bandicoots

Research undertaken by the Department of Conservation and Land Management has shown that bandicoots, whilst usually found in the heath type vegetation typical of dampland wetlands, utilise *Banksia* woodland areas adjacent to the wetland habitat. It would be expected, therefore, that the bandicoots would be present over the upland portion of site in low numbers (Department of Conservation and Land Management, 1994). The proposed removal of the woodland would reduce the carrying capacity of the wetland area for bandicoots.

Further, removal of the native vegetation will increase recharge to groundwater and would likely increase the water level in the wetland. This in turn would decrease the area of heath vegetation, decreasing further the habitat available to the bandicoots.

Existing policy framework

There are two Environmental Protection Authority strategies relevant to this proposal - the strategy for urban conservation, including the protection of vegetation systems of highest conservation value, and the strategy for wetland protection.

1. Protecting regional significant vegetation

The Environmental Protection Authority's strategy on urban conservation relies largely on the Conservation Through Reserves study undertaken by the Conservation Through Reserves Committee, which has been endorsed by Government. This study divided the State into 12 regions or Systems and culminated in recommendations for the reservation of land for conservation and recreation purposes. System Six, or the Darling System, covers the highly populated areas in and around Perth and the South West of the State, and is the area subject to the most development pressure.

The System Six Report recommends the reservation of specific localities on the Coastal Plain and the Darling Range (Department of Conservation and Environment, 1983). Whilst this report has formed a principle focus for the EPA's conservation efforts on the Swan Coastal Plain, it has been supplemented by specific environmental impact assessments of proposed developments over land with high conservation value which has not been recommended for conservation by the study. Two examples are the, so called, Brixton Street and Ellen Brook areas (Environmental Protection Authority, 1991 & 1992).

The resultant strategy adopted by the Environmental Protection Authority includes the following elements:

- an adequate and representative system of reserves should be set aside for the conservation of flora, fauna and landscape;
- such reserves should be properly managed and given security of tenure which recognises their conservation value; and
- the integrity of such reserves should be maintained.

In identifying areas of highest conservation value outside of the areas designated in the System's Report, the following general criteria should be applied:

- the regional vegetation complex is endangered (in general less than 10% of the vegetation complex remains and less than 10% is secured for conservation);
- the area should have a unique attribute or special feature such as diversity of plant and animal communities, habitat for species that are scarce or otherwise threatened and in need of protection, contain elements that have scientific and educational value and have a high degree of naturalness;
- the area should have a high degree of naturalness; and
- the area should be managed to ensure viability.

Decisions on protecting remnant vegetation outside the above framework should be the responsibility of the planning agencies.

2. Wetland protection

The Environmental Protection Authority has consistently recognised the need to conserve lakes and wetlands and has developed a strategy for wetland protection on the Swan Coastal Plain (Environmental Protection Authority, 1993b).

The Environmental Protection Authority discourages proposals which would affect significant lakes and wetlands, that is:

- Lakes nominated for protection in the Environmental Protection (Swan Coastal Plain Lakes) Policy;
- representative wetlands recommended for protection in the Environmental Protection Authority's System Six report;
- wetlands with rare vegetation communities not adequately represented in reserves, or rare flora and fauna (and their habitats); and
- wetland recognised by international agreement because of their importance primarily for waterbirds and their habitats.

Environmental Protection Authority Bulletin 686 (which defines the five wetland management categories) is an advisory document only. It is the responsibility of the proponent and the relevant management authority to manage a wetland in line with the objectives for the relevant management category.

3. Bandicoot habitat

In general, where a development impacts on an individual species which is endangered, the proponent normally deals directly with the Department of Conservation and Land Management under the *Wildlife Conservation Act (1950)*.

Comments from, and negotiations with, key government agencies

The Department of Conservation and Land Management expressed the view that the proposed development is contrary to the objectives of the Jandakot Land and Water Management Strategy (Department of Conservation and Land Management, 1994). It's submission on this CER states that much of the remaining *Banksia* woodland of the Bassendean Complex-Central and South is fragmented and disturbed or under threat by development proposals. Further removal of areas of *Banksia* woodland will compromise the long term survival of any remaining areas as they will be smaller and more susceptible to degradation. The Jandakot Botanic Park is seen as a means of protecting representative areas of these woodlands, wetlands and other vegetation types which would otherwise be under threat.

The Department of Planning and Urban Development initiated the Jandakot Botanic Park and included this block of land because of its high conservation value and linkage from the airport through to Warton Road. Consequently, the Department of Planning and Urban Development is of the view that residential development in the manner proposed in the CER would compromise the conservation value of the site and the Jandakot Botanic Park (Department of Planning and Urban Development, 1994b).

In relation to the Bandicoots, the Department of Conservation and Land Management consider that the area nominated for reservation in the proposal is probably the most attractive habitat for bandicoots. The dislocation of this habitat from the surrounding bush will place the resident bandicoot population at risk from the increased use of the area for recreation and the increased risk of fire and cat and dog predation from the adjacent subdivision. The Department of Conservation and Land Management would require the proponent to undertake a bandicoot population survey and relocation programme prior to development, to which the proponent has committed.

Public Submissions

A number of public submissions emphasised the high conservation value of the *Banksia* woodland on the property. It was argued that the site represents one of the last significant stands of these vegetation types and should be protected.

A number of public submissions expressed concern regarding the potential impacts on the Southern Brown Bandicoot. The loss of upland habitat due to the residential development and associated increase in water levels of the wetlands was of most concern. Another concern raised

was the possible impacts of an influx of dogs and cats on the bandicoots (predation) associated with the proposed residential development.

Proponent's response to submissions

The proponent's response to submissions stated that Beard and Sprenger (1984) classified this vegetation type as *Banksia* woodland with scattered emergent jarrah. Beard and Sprenger were of the opinion that 100% of the area covered by this vegetation type could be considered as lost because it was in private hands. The proponent has calculated that 6.6% of this vegetation type is extant (not cleared or severely degraded), not including those areas zoned for future urban development. Approximately 27% of the extant complex is proposed to be reserved within the Jandakot Botanic Park, with this proposal affecting only 1% of the entire extant complex.

The proponent has determined there are extensive areas of heath vegetation in the area proposed for reservation that are above expected levels of inundation. To minimise any habitat loss the proponent would, in consultation with the Department of Conservation and Land Management and Water Authority, set maximum water levels in the inundated wetland area, and design a drainage system to meet this criteria.

The proponent committed to funding a bandicoot population survey and relocation programme prior to development, and in the management plan would outline means of excluding dogs and cats from the reservation (see Appendix 2).

5.2.3 Environmental Protection Authority comment

The response by the proponent regarding the percent of *Banksia* woodlands remaining are based on classification by Beard (Beard, 1981), which is a very broad classification. The Environmental Protection Authority generally refers to the more specific mapping system of Heddle et al, 1980, which classifies complexes by both soil type and vegetation type. For example, the *Banksia* woodland with scattered emergent jarrah as mapped by Beard includes approximately six complexes defined by Heddle.

The proponent's figure that 6.6% of the vegetation type is extant is in reference to the very broad classification of *Banksia* woodland. When referring, however, to Heddle's Bassendean Complex-Central and South, it is generally accepted that less than 5% remains (Trudgen, 1994). It has been estimated that approximately 5-7% of the Southern River Complex is extant.

It is recognised that the vegetation on this property has high conservation value. The vegetation types present - upland and wetland - are poorly represented in conservation reserves. The presence of the declared rare fauna *Isoodon obesulus* adds to the site's conservation value.

It is likely that the development will lead to the loss of some of the bandicoot habitat. The loss will result from the removal of *Banksia* woodland and from possible loss of heathland habitat (refer to Section 5.3 below).

The site's inclusion in the proposed Jandakot Botanic Park would protect the identified conservation values.

5.3 Wetland impacts

5.3.1 Issue

Wetlands adjacent to or within urban areas often experience a number of changes. The Environmental Protection Authority would normally recommend against developments which have unacceptable impacts on wetlands of highest conservation value.

5.3.2 Assessment framework

Technical/background Information

Using the Semeniuk (1987) wetland classification system, the wetland area on the property has been classified as a dampland (Environmental Protection Authority and Water Authority of Western Australia, 1993). Typically, these wetlands have soils which are waterlogged with little surface inundation, and are dominated by heath-type vegetation (they are often called "heathland" wetlands).

More detailed mapping carried out for the CER showed that there is a significant area of inundation to the east of the site (Goble-Garratt, 1993).

The proponent proposes to use part of the degraded wetland area as a stormwater basin.

Removal of the upland native vegetation surrounding a wetland and its replacement with residential areas usually leads to increased recharge to groundwater and an increase in the water level in the wetland (for example, see Froend et al, 1993, P 136). Increased water levels will lead to :

- increase in the size of the wetland, and
- decrease in the size of heathland vegetation.

Existing policy framework

Where a wetland is of highest conservation value, the Environmental Protection Authority would normally advise that significant changes would be unacceptable, and that measures would need to be put in place to mitigate those changes. Where a wetland is to be modified the following should apply:

- the wetland "function" should be retained within the development; or
- a wetland is constructed or rehabilitated to fulfil equivalent functions.

The Environmental Protection Authority has defined wetland "function" as an "(e)cological (biological and chemical), hydrological or social process carried out by a wetland - eg food web and flood control" (Environmental Protection Authority, 1993b). Environmental Protection Authority Bulletin 686 provides a list of those functions.

Comments from, and negotiations with, key government agencies

Both the Department of Conservation and Land Management and Water Authority expressed concern that the CER did not address the drainage management issue sufficiently, and that water level rises in the wetland could be significant (Department of Conservation and Land Management, 1994 and Water Authority of Western Australia, 1994).

Public submissions

A number of public submissions expressed concern about the likely rise in water levels in the wetland and the subsequent effect on wetland vegetation. The use of wetland areas for drainage purposes was seen as inconsistent with the management objectives of Category H and C wetlands.

Proponent's response to submissions

Calculations by the proponent predict the water surface level in the wetland will increase by 0.17m. The proponent also predicted that this will be ameliorated by the combined draw from the nearby Water Authority bore J120 and establishment of gardens in the urban area, and retention of vegetation buffers on the larger lots.

The proponent has determined there are extensive areas of heath vegetation in the area proposed for reservation that are above expected levels of inundation. To minimise any habitat loss the

proponent would, in consultation with the Department of Conservation and Land Management and Water Authority, set maximum water levels in the inundated wetland area, and design a drainage system to meet this criteria.

5.3.3 Environmental Protection Authority comment

Whilst the it is possible that the development can be planned so that maximum water levels can be set and maintained through outlet drainage, it is likely that the duration and frequency of the maximum water levels will increase. This change in hydrology will likely lead to loss of heathland vegetation.

More work would need to be carried out to show that drainage and water levels in the wetland can be managed. It may be that any drainage required for the development of this site may be inconsistent with the protection of the wetland's values.

On-site disposal of stormwater would need to take into account the existing wetland functions, and it may be found that a stormwater basin within the existing wetland area is unacceptable.

5.4 Noise

5.4.1 Issue

The property is in close proximity to the Jandakot Airport and is subject to considerable airport noise, which will increase if the proposed expansion to the airport proceeds. There is also a dog kennel zone adjacent to the site which produces significant levels of noise at certain times during the day. The Environmental Protection Authority would normally recommend against residential developments subject to unacceptable noise levels.

5.4.2 Assessment framework

Technical information

1. Jandakot airport

The Federal Airports Corporation has provided Australian Noise Exposure Forecast (ANEF) contours for the land surrounding the airport as a measure of noise exposure (refer to Figure 4). The proposed development is located between the 25 and 20 ANEF contours. Research has shown that at this level of noise it is expected that at least 40% of the population would be moderately affected, with 10% of those severely affected (Hede & Bullen, 1982).

2. Kennel Zone

An acoustic survey undertaken on behalf of the proponents assessed the effect of noise emanating from the dog kennels. It was shown that noise levels consistently exceeded the Noise Abatement (Neighbourhood Annoyance) Regulations 1979 between the hours of 2200 and 0700, although the specialist consultants report carried out for the CER claim that the actual time that the high noise levels were recorded were between 0600 and 0700 hrs are likely to be caused by birds within the area and not the dogs (Herring Storer Acoustics, 1993, p4)).

Existing policy framework

1. Jandakot airport

The Environmental Protection Authority has previously stated its concern regarding the ability of the ANEF system to accurately predict aircraft annoyance, and believes that planning agencies should be conservative in their use as a decision making tool, particularly around Jandakot airport. Jandakot is used for training purposes, with many aircraft making numerous circuits around the airport creating a constant nuisance (Environmental Protection Authority,

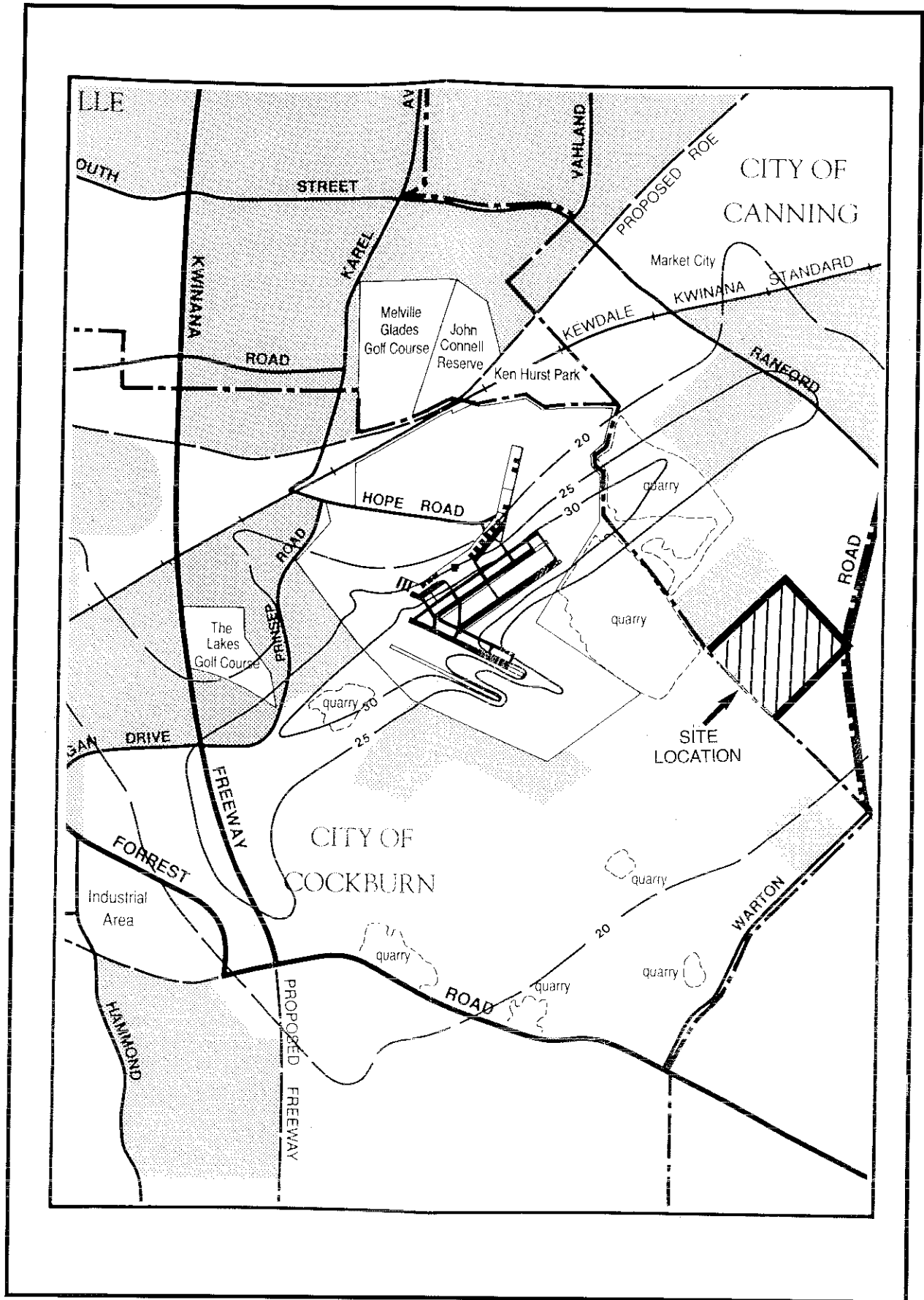


Figure 4. Australian Noise Exposure Forecast, Jandakot Airport (from Dames & Moore, 1993)

1993c). The Environmental Protection Authority stated that serious consideration be given to not allowing residential development within the 20 - 25 ANEF.

2. Kennel Zone

In recognition of the potential for conflict between new residents and existing kennel zones, the Environmental Protection Authority has previously recommended a 1 km buffer zone around kennel zones (Environmental Protection Authority, 1993d). This recommended buffer zone is based on experience of officers of the Department of Environmental Protection, but could be reduced on a case by case basis where the proponent can demonstrate that impacts on residents located closer than 1km would be acceptable.

Public Submissions

Public response on this issue highlighted the current impacts on existing residents on the western side of the airport, and questioned the suitability of residential development near the airport.

The public submissions also questioned the adequacy of the proposed vegetated buffer as a measure of noise attenuation from the kennel zone.

Proponent's response

The proponent acknowledges that noise levels on the site due to the airport related activities are elevated but that they are within the limits normally recommended for residential development by the planning agencies, and are in accordance with Australian Standards for aircraft noise (Herring Storer Acoustics, 1993). Prospective purchasers will be advised of the potential for noise, and restrictive building covenants will be registered on the title of all lots, which will require the incorporation of noise control features into the design and construction of buildings.

In response to the concerns regarding noise from the kennel zones, the proponent agreed to construct an earth berm with a continuous masonry fence to a height of 3m. This is in addition to the vegetated buffer zone incorporating the larger block sizes.

5.4.3 Environmental Protection Authority comment

The Environmental Protection Authority considers that the potential for noise impacts from aircraft and the nearby kennel zone are a constraint to the development of this land for urban purposes. More measurements of the noise from the kennel zone would be appropriate to establish the true extent of the nuisance caused by the dogs.

5.5 Groundwater

5.5.1 Issue

The property is within the Water Authority's Jandakot Priority 2 Source Protection Area. The Environmental Protection Authority would normally recommend against urban development over the central portion of the Priority 2 area between the Water Authority bore-lines. This property is not within this central area.

5.5.2 Assessment framework

Technical information

Much of the Swan Coastal Plain is underlain with groundwater resources. The Coastal Plain is the surface expression of what is known as the Perth Basin. This basin lies to the west of the

Darling Fault: the Yilgarn Block lies to the east of the fault. The Perth Basin is a deep trough filled with ancient sedimentary rock. It is about 1 000 km long, averages 65 km wide, and has an average depth of about 13 km.

The Swan Coastal Plain consists of a series of roughly parallel north-south landforms which lie on top of the ancient sedimentary rocks. The landforms were produced during the last 2 million years through the actions of the sea and the rivers that flowed off the Darling Scarp, and are a mixture of sand, limestone, and sand mixed with clay and other riverine deposits. Because these landforms lie on top of the main rock layer, they are called the "superficial" formations, ranging in thickness from 10m to 100m.

Rain which falls on these porous formations percolates down through the sand rather than running off the surface and forming watercourses. This water's downward movement is stopped by underlying impermeable levels, usually the ancient sedimentary rock. There is some slow horizontal movement of water within formations but it is not quick enough to stop vertical filling within the formation. Wetlands and natural springs are produced where the water table rises sufficiently to break through the surface.

These groundwater aquifers are said to be "unconfined" because there is no impermeable layer above the aquifers to stop upward movement of the watertable. The water is mostly fresh with few contaminants.

In several places, the groundwater "mounds" as discharge, through horizontal movement or evapotranspiration, is slower than recharge through rainwater. One such mound exists in the Jandakot area and is called the Jandakot Mound. Groundwater tends to move away from the top of the mound, and the central area of the mound is the main recharge area for the whole mound.

The larger aquifers close to urban areas, for example Jandakot, are valuable sources for potable water for human consumption and for agricultural purposes.

Untreated effluent from industries and intensive agricultural activities, and contaminants from activities associated with residential development, could contaminate the groundwater making it unsuitable for human consumption and causing problems in downstream wetlands.

Land use planning over these groundwater mounds should identify areas where land uses which would cause a deterioration in the quality of the groundwater are not permitted.

The site in question here lies to the north and east of the top of the mound, and groundwater generally moves in a northerly direction through the property. It is downstream of any Water Authority bore, although bore Number J120 is directly adjacent to the site, located on the south west side of Acourt Road about half way down the south west property boundary.

Existing policy framework

1. Environmental Protection Authority Policy

The Environmental Protection Authority published for public review and comment in October 1992 a draft Environmental Protection Policy (EPP) to protect groundwater of the Jandakot Mound (Environmental Protection Authority, 1992). Submissions on that draft policy were received from members of the public, industry, community and conservation groups, local government and State agencies. The Environmental Protection Authority substantially revised the draft policy in line with comments received, and released the second draft policy for public review and comment in January 1993 (Environmental Protection Authority, 1993e).

The current draft EPP has the policy area divided into two areas, A and B. Area A covers the central part of the mound and is between the public water supply bore lines. Within this area, which is the main recharge area for the mound, urban, industrial and horticultural development should not take place, and there are further controls on the use of groundwater, filling of land and discharge of contaminants. In Area B these activities may take place subject to Water Authority policy and stringent controls. This land is located within Area B.

This draft policy being reconsidered by the Environmental Protection Authority following the review of further submissions, and a revised draft policy will be published for public inspection

and forwarded to the Minister for the Environment. The Minister may then consult with individuals and agencies affected by the policy, and when satisfied may approve that policy by order in the Government Gazette. Unless otherwise specified by the Minister, the approved Policy must be reviewed within seven years of gazettal.

As part of its review of the Draft Environmental Protection (Jandakot Groundwater) Policy, the Environmental Protection Authority is considering the option of making the Areas A and B consistent with the Water Authority's Priority 2 and 3 areas. If this were to happen, the Acourt Road site would become Area A as defined in the Environmental Protection Policy where urban development would be considered unacceptable.

2. Water Authority Policies

The Water Authority has declared the central portion of the Jandakot Mound as an Underground Water Pollution Control Area (UWPCA). The associated Catchment Protection Policy specifies appropriate types and levels of development in accordance with preferred levels of protection for groundwater. The Water Authority has defined two priority protection levels for the land within the Jandakot UWPCA, Priority 2 and Priority 3, which roughly (but not exactly) correspond to Areas A and B of the EPP.

Priority 2 areas have a high priority for public water-supply use and restricted development may take place, within Water Authority policy guidelines. Those guidelines state that urban development should be managed and limited to that shown in Government strategic planning documents (Kim Taylor, pers com), in particular, Metroplan (Department of Planning and Urban Development, 1990a) and the Urban Expansion Policy (Department of Planning and Urban Development, 1990b). The site for this proposal was not included in either of these strategic documents.

Priority 3 areas are afforded a lesser level of protection with management controls rather than land use restrictions.

To maintain the quality of groundwater drawn from its wells, Water Authority bylaws require a 300m wellhead protection zone around each bore.

3. Planning policy

The Department of Planning and Urban Development has published the draft Jandakot Land Use and Water Management Strategy which details the current and future land developments permitted over the Jandakot Groundwater Mound (Department of Planning and Urban Development, 1992). The land subject to the proposal is identified as part of the Jandakot Botanic Park and proposed for conservation. Within this document a portion of the property is identified as woodland of high conservation value, and the property in its entirety is identified for inclusion in the Jandakot Botanic Park. This document was developed by various State Government and Local Departments including the Water Authority of Western Australia and the Environmental Protection Authority.

Comments from, and negotiations with, key government agencies

The Water Authority of Western Australia "strongly opposes" the development of this land for residential purposes (Water Authority of Western Australia, 1994). Urban development is not the preferred land use in designated Priority 2 Source Areas as the possibility of groundwater contamination may be increased. To reduce the possibility of contaminating the aquifer all urban and future urban developments in the eastern half of the UWPCA have should be located within areas designated as Priority 3 Source Areas. The Water Authority also re-iterated its policy regarding limiting urban development within Priority 2 areas (refer to "Existing Policy Framework" above).

The Water Authority also noted that the development as proposed in the CER did not allow for the required 300m wellhead protection zone.

Public submissions

A number of the public submissions expressed concern that the development may increase the risk of groundwater pollution.

Proponent's response

The proponent has made an additional commitment to comply with the Water Authority's bylaw for the wellhead protection zone through a minor re-design of the subdivision. The proponent felt that this development would no longer pose a threat to public water supply as the site is located downstream of any Water Authority bores.

5.5.3 Environmental Protection Authority comment

The Environmental Protection Authority has previously stated that residential development between the Water Authority bore lines (Area A) is unacceptable. It also supports the Water Authority in its position that urban development in the remainder of the Priority 2 area should be limited, and that Government strategic planning documents offer the best framework to manage urban development in these areas.

The Environmental Protection Authority is currently considering whether to extend the Area A as defined in the Environmental Protection Policy to include all of the Water Authority's Priority 2 Area.

Where development is to proceed, it should be set back a minimum of 300m from a Water Authority public water supply bore as required Water Authority bylaws.

5.6 Other issues

5.6.1 Overview

The following issues were also raised through the public submissions:

- problems associated with managing bushland areas adjacent to residential areas;
- drainage management; and
- inconsistency of this proposal with the need for an wide rural wedge between the south west and south east urban corridors.

5.6.2 Managing bushland in urban areas

Concern was raised that, should this development proceed, the 38 ha of bushland to be set aside for inclusion in the Botanic Park will come under pressure from nearby residents, increasing the management required to protect the area. Possible impacts include:

- increased risk of fire;
- weed invasion; and
- increased recreation usage causing loss of loss of vegetation through trampling and the provision of tracks.

The proponent responded by pointing out that it had made a commitment (Commitment 6.7) to develop a management plan for the area which would include issues of access, fencing and education.

5.6.3 Drainage management

The Water Authority of Western Australia questioned the viability of the drainage plan (Water Authority of Western Australia, 1994). The clearance of land would increase runoff and

recharge, and cause the southern portion of the development to remain inundated for longer periods. Runoff from this portion of the land currently flows into a local authority catchment which is surrounded by Main Drain catchments. The expected increase in runoff may exhaust the capacity of the Main Drainage systems.

The proponent responded by saying that only the northern portion of the land will require off-site drainage (via the Amherst Road Branch Drain). Drainage on the southern portion could be managed through on-site recharge of the groundwater. The issue of the capacity of the main drain to accommodate the off-site drainage was not addressed. It should also be noted that the proponent made a commitment to set an upper limit on the water levels in the wetland on the south of the property. This is likely to require some additional off-site drainage.

5.6.4. The need for an wide rural wedge

The Department of Planning and Urban Development raised concern that one of the principles of Metroplan (Department of Planning and Urban Development, 1990a) was to retain rural "wedges" between the two northern and the two southern urban corridors. The term "wedge" is used by the Planning Agencies to refer to the rural land which separates the South East and South West urban corridors of the southern metropolitan area, and the North East and North West urban corridors of the northern metropolitan area. Metroplan identifies six reasons why these "wedges" should be maintained. These are to:

- protect regionally important groundwater resources and wetlands;
- protect important rural and natural landscape features not protected in reserves;
- protect important agricultural land and sources of basic raw materials;
- avoid unnecessary urban sprawl by preventing unplanned outward spread of urban areas away from land identified for future urban development;
- providing locations for special land uses necessary for urban development, but which should be located away from residential areas (for example, wastewater treatment plants and poultry farms) and
- preserve the rural character of the zone. (Department of Planning and Urban Development, 1990a, p74).

Metroplan identified this site for inclusion in the rural wedge between the two southern corridors. The inclusion of this site in the urban portion of the South East corridor was inconsistent with the aims of Metroplan.

The proponent responded by saying that this land abuts existing urban areas and is a logical extension to the corridor. Having a 38ha conservation area to the south of the residential portion of the development provides a well defined boundary to the corridor at this location.

5.6.5 Environmental Protection Authority comment

The first issue (managing bushland in urban areas) relates to on-going management following development and is not seen as being constraints to development. The agency responsible for on-going management would be determined by the Department of Planning and Urban Development once the land was included in the Botanic Park.

The drainage issue would need to be resolved through the planning system prior to development proceeding. The proponent would need to consult with the Water Authority to ensure that, where off-site drainage is required, the main drainage system can cope with the water. This matter can be resolved through the planning system should this development proceed.

Whilst the third issue is mainly a planning matter, the Environmental Protection Authority supports the need for a rural wedge between the two corridors because:

- the main recharge area for the Jandakot Mound is within this wedge;

- there are important wetlands in the region which could be severely degraded where urban development is permitted close to these wetlands; and
- the wedge supports areas of remnant bushland areas of highest conservation value.

6. Discussion and synthesis

The land proposed for development supports vegetation complexes of high conservation value. The proposal seeks to clear 58 hectares of *Banksia* woodland and conserve 38.2 hectares of wetland. The wetland area would be ceded to Department of Planning and Urban Development for inclusion in the Jandakot Botanic Park.

The recognition of the high conservation value of the property has resulted in the Department of Planning and Urban Development proposal including the land parcel in its entirety as part of the Jandakot Botanic Park. The mechanism by which this is occurring is the Metropolitan Region Scheme South West Corridor (Stage A) Amendment, which proposes the reservation of the land for Parks and Recreation. If the Amendment proceeds as proposed the land will be rezoned from Rural zoning to Parks and Recreation reserve. The Environmental Protection Authority supports the Jandakot Botanic Park and the reservation of land of high conservation value for this purpose.

The Environmental Protection Authority recognises that a number of environmental issues constrain the development of this land for urban purposes. These include:

- the conservation of regionally significant upland and wetlands vegetation;
- impact on wetlands;
- noise from both the Jandakot Airport and nearby kennel zone; and
- protection of groundwater resources.

7. Conclusion

The Environmental Protection Authority concluded that, should this site be included in the Jandakot Botanic Park as proposed in the Major Amendment for the South West Corridor (Stage A) currently under consideration by the planning agencies, the issues associated with the Canning Property Group proposal would effectively be resolved. The Environmental Protection Authority supports the inclusion of this site in the Botanic Park and considers that it is not appropriate to complete the environmental assessment of this proposal until the MRS Amendment is finalised. Should the Minister for Planning resolve not to include this land or a portion of this land in the Jandakot Botanic Park, the Environmental Protection Authority will finalise its assessment.

Accordingly, the Environmental Protection Authority recommends as follows:

Recommendation 1

The Environmental Protection Authority recommends that, in relation to the assessment of the environmental acceptability of the proposal to develop part of Lots 122, 123 and 403 Acourt Road Canning Vale for residential purposes:

- **the comments of the EPA in the Bulletin be noted by the Planning Agencies;**
- **the assessment should not be completed until after the conclusion of the major Metropolitan Region Scheme Amendment for the South West Corridor (Stage A) process;**
- **the assessment should only be carried out in the event that the subject land is not reserved for "Parks and Recreation" in the Amendment, in which case, the Environmental Protection Authority would report again to the Minister for the Environment.**

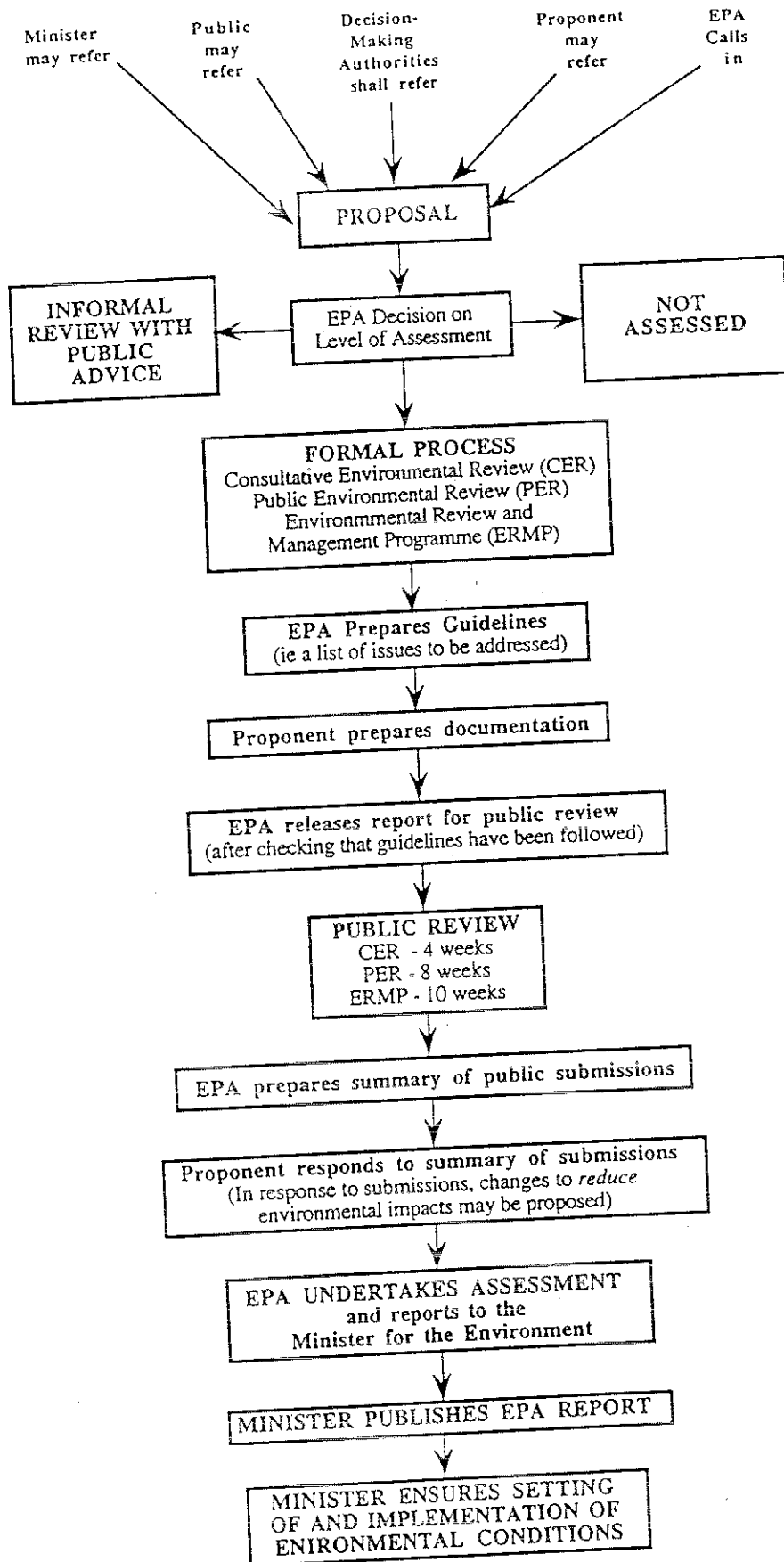
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Appendix 1

**Environmental impact assessment
administrative procedures 1993**



EPA decides within 28 days. Anybody may appeal to the Minister within 14 days on level set; Minister may direct higher level but not vice versa

DMA cannot allow implementation unless either no formal assessment or the Minister Authorises. Process not suspended

Draft guidelines usually issued within 14 days of first meeting with proponent

EPA usually completes summary in 2-3 weeks

Report release often 3-5 weeks after receipt of response to submissions

Anybody may appeal on EPA report to Minister within 14 days. Minister may remit to EPA or take appeal into consideration when setting conditions

Proponent may appeal on conditions within 14 days of issue

Appendix 2

**Summary of submissions and proponent's response
to submissions**

**ACOURT ROAD CANNING VALE
PROPOSED SUBDIVISION
RESPONSES TO PUBLIC SUBMISSIONS**

Prepared by BSD Consultants

in conjunction with

Wood & Grieve Engineers

1 Protecting the integrity of the proposed Jandakot Botanic Park

1.1 Comment *The entire site has been identified for inclusion in the park. If this site is allowed to be developed, even partially, for urban purposes it would set an undesirable precedent and lead to further loss of land in the park.*

Response The site was identified in the draft Jandakot Land Use and Water Management Strategy (JLU&WMS). The draft strategy will be finalised after the gazettal of the south-west corridor amendment which is expected mid 1994. The JLU&WMS acknowledges the difficulty of determining the final extent of the park in terms of size, fragmentation and ownership. This proposal offers a means of establishing a part of the Jandakot Botanic Park (JBP) by giving up in excess of 38 hectares of the most environmentally sensitive land.

Detailed discussion with David Everall and Julie Rowlands of DPUD who were the authors of the Jandakot Botanic Park proposal have clearly indicated that there is "no contest" in respect to the argument that the planned urban area subject to this CER has specific environmental significance which would warrant its inclusion in the Park proposal. They support the "Urban" option providing the case for "Urban" zoning is made but are opposed to it remaining within the Rural zone.

In terms of precedent it is expected that any similar proposal would be subject to full formal environmental assessment under Part IV of the Environment Protection Act. Each proposal would therefore be assessed on its acceptability and not simply use this proposal as a precedent.

The proposal that a portion of the subject land is developed and the balance reserved as part of the Jandakot Botanic Park is only possible due to its proximity to developed urban infrastructure. It will not set a precedent for development of isolated pockets of rural land which are remote from such infrastructure. The proponent is contributing to the active implementation of the Jandakot Botanic Park and establishing a positive precedent for other owners.

1.2 Comment *The additions to the Park as proposed in the CER are contrary to sound ecological principles for protection of bushland areas: The size of areas to be protected should be maximised. The proposed conservation of 38ha is too small making ongoing management difficult.*

Response The proponent is somewhat unclear as to which "sound ecological principles" the comment refers. A history of human activity on the subject land (and that adjacent) including grazing, selective clearing and timber felling, invasion of exotic plants and animals, predation by domestic and feral animals and burning make "sound ecology" arguable in this area.

An accepted ecological principle for protection of bushland areas is to protect areas of high value. Comparison of the proposed Jandakot Botanic Park boundaries with areas of high value woodland mapped by Bowman Bishaw Gorham (1990) in the JLU & WMS indicates inclusion of extensive areas of low value woodland into the Park at the expense of high value woodland.

A further principle is to minimise the 'area to edge' ratio of protected areas in order to reduce outside impacts. Inclusion of the subject land into the JPB is therefore questionable as it is very exposed to edge effects and only a minor proportion of its area is classified as high value woodland.

The area to be set aside for park in this proposal is 38 ha which represents 42% of the landholding and is a substantial area of land which is to be given up free of cost. Such areas are known to provide habitat and refuge for a large number of native flora and fauna. Furthermore, there are many examples of parkland and conservation reserves which exist near to urban development and which offer sanctuary, breeding sites and refuge for flora and fauna.

The Jandakot Botanic Park is based on overall planning considerations which require the amalgamation of land from several landholdings to form each area. The proponent is setting aside 38ha which with other adjacent areas, when obtained, will provide a satisfactory area for conservation and management.

2 Loss of important upland (*Banksia* woodland) vegetation

2.1 Comment *Most of the Canning Vale ecosystem type has already been cleared for development. This site represents one of the last remaining examples of this ecosystem type. The upland vegetation would be entirely lost under this proposal. There are large areas of cleared land that should be developed in preference to this site.*

Response The proponent believes the statement to be incorrect. There are extensive areas of *Banksia* woodland with scattered emergent jarrah and wetland which remain uncleared, much of which is proposed for inclusion in the Jandakot Botanic Park (approximately 27% of that remaining extant).

Beard (1979) states, that the Bassendean System, to which the 'Canning Vale ecosystem type' belongs, consists of an intricate mosaic of vegetation controlled essentially by drainage. *Banksia* woodland is the dominant component of this system and the complex of issue is at present widely distributed from Canning Vale south to Wellard. Beard (1979) also states that freshwater swamps between the dunes occupy a large proportion of the Bassendean system. Therefore the particular combination/continuum of woodland to wetland that occurs on the subject land is not unique within the distribution of this complex and undoubtedly occurs frequently within those areas proposed for reservation in the Jandakot Botanic Park. Therefore the subject land does not represent a last remaining example of this woodland complex or the 'ecosystem' represented by the woodland/wetland mosaic.

The upland vegetation (woodland) to be lost under this proposal is well represented throughout the proposed Jandakot Botanic Park. While much of the woodland within the proposed urban area would be developed as part of this proposal, large lots along Clifton and Fraser Road would retain significant vegetation and controls would be considered to ensure this.

The proposal prioritised the conservation of the wetland area in accordance with EPA policy and Bulletin 686 (EPA, 1993) which recommends retention and enhancement of the wetland categories as assessed in the CER.

Comment *There are other large areas of land which should be developed in preference to this site.*

Response The availability or suitability of other areas of land is beyond the scope of this assessment and beyond the landholding of the proponent and the proponent. This proposition is not supported as future urban expansion options in the corridor are limited because of the range of constraints which exist.

2.2 Comment *The entire bushland area was identified as having high conservation value according to an independent report to the Department of Planning and Urban Development and should be protected.*

Response The proponent is aware of an independent unpublished report to DPUD by consultants Bowman, Bishaw & Gorham which has not been released. Informal advice to the proponent indicated that this land was not assessed environmentally in the report. The advice given by DPUD referred to in Point 1.1 above is extremely relevant and provides a different opinion to the comment.

2.3 Comment *The flora survey of the site indicates that some of the best bushland on the site is in the upland areas proposed for residential development. Why didn't the proponent take the advice of its independent consultant when selecting areas to be redeveloped.*

Response The proposal provides for conservation of the wetland in order that general EPA policy on wetlands and specifically, the recommendations of EPA Bulletin 686 on wetland retention and enhancement are observed. By adopting this policy, conservation and management of wetland areas assume high priority. The advice of the botanical consultant was carefully considered in detail by the proponent and the original proposal was modified. The proposal now includes larger lots along Clifton and Fraser Roads. These lots will have specific vegetation protection covenants and the proponent will enhance the vegetation areas to assist in noise abatement.

Again the position of the authors of the JBP proposal confirms that they are happy to support the CER urban proposal, a matter which is set out in various internal DPUD staff reports.

2.4 Comment *The Banksia-sheoak-jarrah community type is now the least common Banksia Woodland community type on the Swan Coastal Plain. This site contains one of the last significant stands of this community type and will be lost if this proposal proceeds.*

Response The comment is not substantiated by any data and the proponent believe it to be incorrect. Banksia Woodland with scattered emergent Jarrah was mapped Beard (1981) as the original predominant vegetation type on the Bassendean Sands from approximately the Beechboro/Midland area southwards to around the level of Rockingham. As early as 1984 Beard concluded that all of this vegetation type could be considered as lost as 100% of the area it covered was in private hands (Beard and Sprenger, 1984). The proposals for the Jandakot Botanic Park stemmed from, amongst other things, the realisation that Banksia Woodlands in general, and on the southern Swan Coastal Plain in particular, were under threat (Hopper and Burbidge, 1989). In their paper, Hopper and Burbidge estimated that 14.5% of the original woodlands classified as the Bassendean Central and South Woodlands Complex, which extends from Cockleshell Gully to Busselton and includes the Banksia woodland complex with

scattered emergent jarrah, was still extant with approximately 10% afforded some sort of protection. We believe that these figures were based on an assessment of satellite imagery. The conclusions of Trudgeon (1990), which are stated in the Jandakot Land Use and Water Management Strategy were made after mapping the area covered by the Bassendean Central and South Complex from aerial photography, and he was of the opinion that some 95% of the original cover had been cleared.

The proponent has calculated that 6.6% of the original Banksia woodland with scattered emergent jarrah (high value woodland) remains extant, not including those areas zoned for future urban development. Approximately 27% of the extant complex is proposed to be reserved within the Jandakot Botanic Park. The proposed development will affect 2.6% (30ha) of this complex within the Jandakot Botanic Park which represents only 1% of the entire extant complex.

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3 Problems of management of the remaining bushland area following development.

3.1 Comment Allowing large numbers of residents so close to such a small area of bushland (the proposed 38ha for conservation in the CER) would present significant management problems. Fire management would lead to loss of ecological value of the remnant bushland area through:

The requirement for larger than normal firebreaks, which would lead to a further loss of protected bushland area; and

More frequent prescribed burning would need to be carried out to minimise fire risks to nearby residents. This would lead to a loss of ecological value of the bushland area through fire induced charges.

Response There is no reason to assume that significant management problems will result from allowing large numbers of residents near the park (eg Karrakatta bushland is a valuable flora reserve). The JBP is intended for multiple use, including recreation and conservation and hence, people will be permitted to use the park. Allowing residential development near the park will allow greatly enhanced management through control of access and community participation. The proponent has made a commitment in the CER (Commitment 6.7) to document a management plan for the relevant section of the park which will address issues including education, access and fencing. The conservation zone is only part of a larger area encompassing surrounding land and the area is not small.

It is not logical to assume that more frequent prescribed burning will be required. Currently, uncontrolled regular and frequent burning has resulted in significant vegetation destruction and loss of ecological value as can be witnessed by site observation. Management of the park by competent managers, possibly CALM, will result in better fire management, less fires and more healthy flora. Standard fire breaks only will be required and will not compromise a reserve of the ultimate size. Community participation and education will assist in management of the reserve.

4 *Inadequacy of the flora and fauna surveys.*

4.1 *Comment* *Whilst no rare or priority species of flora were found on the site, the report was based on limited survey work and a more thorough survey is required.*

Response The flora survey was undertaken in late September and October 1993 as stated in the CER. The methodology and extent of the survey is also outlined. The spring survey was post fire which is important for the emergence of *Diurus purdeii* and represented an accurate assessment of the flora of the site. The botanist has done extensive work on DRF for CALM and proponents in the Canning Vale area and is sufficiently experienced to identify significant flora.

4.2 *Comment* *The fauna survey was only superficial and was unable to identify nocturnal mammals that may be present. A more thorough survey is required.*

Response A full fauna trapping survey was not undertaken and was not considered necessary by the consultants considering the status of populations of native mammals in the region. The proponent has amended commitment 6.9 to undertake a bandicoot survey as outlined in the CER. The commitment is now:

6.9 The proponent will fund a bandicoot survey and a relocation programme in conjunction with CALM prior to development.

4.3 *Comment* *The CER claims that there is no sign of dieback infection. An examination of the site clearly shows that dieback is a problem. A more detailed survey should be carried out to assess the extent of the infection and the proponent should then propose management measures to deal with the problem.*

Response Dieback disease can be a problem in Banksia woodland and is widely recorded in the Canning Vale area. It is a concern in conservation areas where the health of native flora is a critical issue. In residential areas, earthworks and imported soil regularly result in the introduction of the dieback fungus. Management of private gardens is a domestic issue.

The botanist noted that "many of the understorey plants which are sensitive to the pathogen...are common and in good health." The presence of dead Banksia was noted and this may be the reference to dieback in the comment. The proponent is not aware of any positive identification of the fungus from the site. -

The proponent understands that there is a risk of spread of dieback from areas proposed for development and those for conservation. A dieback survey would be undertaken prior to the subdivision stage to test for the presence or otherwise of dieback. Should the tests demonstrate that dieback is present, a management plan would be put in place. This would be to the satisfaction of CALM.

The additional commitment is:

6.10 The proponent will undertake a dieback survey prior to subdivision in conjunction with CALM and implement all necessary control measures.

5 Protection of groundwater resources

5.1 Comment *The proposed urban area is adjacent to a Water Authority bore. Pollution from the urban area would contaminate water being extracted through the bore.*

Response The development will be properly designed and managed and chemical inputs to groundwater from residential development do not have high potential to contaminate groundwater as in the case of industrial or commercial land uses eg underground storage tanks. Notwithstanding, the direction of groundwater flow is away from the bore and should any minor increases in aquifer concentrations occur, they would be carried away from the mound removing any real risk of contaminating the water for extraction. The setback or buffer zone surrounding WAWA bores provides a further safeguard against this minor possibility.

5.2 Comment *A CSIRO study of the Gwelup bores showed that two of the 11 bores were heavily contaminated, and another three were substantially contaminated. There are inadequate controls over underground storage tanks to stop contamination of the groundwater, and urbanisation should not be allowed over groundwater mounds.*

Response Few comparisons can be made between Gwelup and this proposal. The Gwelup borefield is located on and adjacent to areas of historic land use. Residences were unsewered and underground storage tanks and agricultural activities were present. This will not be the case in the proposal. The CER specifically addresses the exclusion of underground storage tanks.

5.3 Comment *The subject land is within the Jandakot Underground Water Pollution Control Area (UWPCA), Priority 2 Source Area, where urban development is not preferred land use. Increasing numbers of people in the area increases the possibility of negligent discharge of chemicals and other liquid wastes which will contaminate the groundwater.*

Response Refer to comments the above response at 5.2. While Water Authority guidelines state that is not a preferred land use, it is not specifically excluded and hence can be approved on review.

5.4 Comment *There is an inaccuracy in the CER relating to Water Authority Bylaws. The Bylaws require a 300m wellhead protection zone around each production well. The proposal does not comply with the Bylaw.*

Response The proponent and his consultants were informally advised that a 100m setback for residential development from a bore is acceptable. The 300m setback is largely in response to industrial and commercial land use. The proponent has made the additional commitment:

6.11 The proponent undertakes to comply with the Water Authority requirements for setbacks from production bore J120.

5.5 Comment *The CER indicated that it would use amended soil in the drainage basins to strip nutrients from the stormwater. The Water Authority opposes the use of "red mud" in UWPCA's because it contains chemicals which could leach into the groundwater making it unsuitable for human consumption.*

Response Acknowledged. Although the CER did not specify red mud, the proponent will commit to use materials which are acceptable to the authorities, should they be necessary. The proponent has made the additional commitment:

6.12 The proponent undertakes to obtain the approval of the Water Authority for any amended soils to be used in the drainage basins.

6 Ongoing Management of Jandakot Botanic Park

6.1 Comment *The CER claims that the "no development" option - the whole site being included in the Park - would lead to the further degradation of the bushland through lack of management. This would not happen if the community were to become involved in managing the area. EPA's Ecoplan provides individuals and community groups with the skills to manage remnant bushland areas.*

Response The existence and value of Ecoplan is acknowledged. Notwithstanding, there is no management of the area and the landowner has not been approached regarding the issue. The following activities are now occurring on the land:

- exercise of dogs from the kennel zone,
- fires,
- dumping of refuse,
- car dumping,
- horse riding,
- off road vehicles and
- timber cutting.

These are all leading to obvious degradation of the flora and soil stability and no management is in place. These are important management issues which need to be addressed for the area to function as an effective conservation and recreation reserve. Furthermore, they are expected to continue. The proposal seeks to formalise and cede part of the land as secure managed parkland. Ecoplan and CALM will play a major role in managing the reserved section of the subject land.

7 Comment Southern Brown Bandicoot

7.1 Comment *The Southern Brown Bandicoot is unlikely to survive the influx of dogs and cats associated with the proposed residential development.*

Response The proposal recommends fencing and appropriate signage to inform of the conservation status of the proposed park. Management of the area will aim to exclude dogs and cats. Currently, control of access cannot be justified and domestic pets can be expected to have some impact on the bandicoot population. There are a number of examples of bandicoot populations which exist adjacent to urban developments in the south west corridor. A final resort would include a relocation program. The CER provides a commitment to survey the bandicoot population.

7.2 Comment *The bandicoots prefers the heath vegetation associated with damplands (wetlands which are seasonally waterlogged). Removal of deep rooted native vegetation to allow development will cause the water table to rise which would increase the amount of surface inundation. This would alter the wetland vegetation to the extent that the bandicoot's habitat is destroyed.*

Response Field surveys and vegetation patterns indicate that the wetland areas experience elevated high water levels during above average winters and that there is extensive areas within the 38 ha which are not inundated.

Specific site surveys confirm that there are extensive areas of heath vegetation in the area proposed for reservation that are above levels of inundation. Furthermore, to minimise any habitat loss, engineering drainage design will be examined to assess the maximum groundwater level in the sumpland area. As there is not a constructed drainage outlet for the southern portion of the site the disposal of stormwater will be by soakage. The drainage system within the proposed urban zone will incorporate greenstreet soakage systems to reduce surface runoff to the sumplands. The proponent will establish maximum water levels in the sumplands in conjunction with the Water Authority and CALM. The proponent makes the additional commitment:

6.13 The proponent will derive maximum groundwater levels and soakage disposal systems in conjunction with Water Authority and CALM.

8 Noise impacts

8.1 Comment *It is unwise to locate more residents near the Jandakot airport when existing residents are strong opposed to the airport remaining in its current location. The main concern is the noise from the aircraft.*

Response Noise levels are within the Australian Standards for residential development as outlined in detail in the CER, Appendix 2. The proponent acknowledges that elevated but acceptable noise levels from aircraft will be experienced within the subdivision. However, reference to sales activity at recent residential developments (eg Turnberry Green, Berrigan Drive) closer to the airport demonstrates that residents are willing to accept aircraft noise. Potential purchasers will be advised in writing and by signs of the potential for noise. Should the residents opposing the airport achieve their relocation objective then this noise will not be relevant.

The proponent is prepared to comply with Australian Standard AS2021 relating to development adjoining or near airports. The proponent makes the additional commitment:

6.14 The proponent will comply with AS2021 and require, by sales agreement and restrictive covenant to be registered on the title of all lots, the need for all dwellings to be built in accordance with the following standards:

- Double brick or masonry construction
- Clay or concrete roof tiles
- Boxed eaves
- 6mm glazing
- Solid core doors
- R2.5 rated insulation bats in the roof space

8.2 Comment *The proposed 30m vegetated buffer between the kennel zone and the houses is inconsistent with previous advice from the Environmental Protection Authority. In its advice to the State Planning Commission regarding a proposed MRS Amendment in the Southern River area, the Authority recommended that a 1 km buffer should be provided between kennel zones and houses.*

Response The comment partly arises from statements in EPA Bulletin 717 on setbacks of residential land from poultry farms and a kennel zone at Southern River. While the recommended one kilometre buffer zone from kennels sounds excessive, the Bulletin states that the onus should be on the developer of the residential land to show that impacts to potential residents would be acceptable. Appendix 2 and section 5.4 of the CER addresses these impacts and their management. Vegetated buffer zones, signs, notification to potential purchasers and possibly notices on lots will be adopted. Investigations at the adjacent development at Ranford Estate demonstrated that a vegetated buffer of 150m immediately adjacent to complement existing POS and a 20m setback within larger lots abutting Clifton Road would provide sufficient noise attenuation. The proposed 30m buffer maintains this philosophy.

The proponent has demonstrated that, provided a vegetated buffer is provided, noise from the kennel zone will be within acceptable limits (refer Appendix 2 of the CER). However, the proponent is prepared to redevelop the subdivision to additionally construct an earth berm along the Fraser Road frontage and a continuous masonry fence on the berm to a total height of 3m. This has been discussed with the City Planner - Mr Chris Eaton at the City of Canning and subject to the land forward of the fence being landscaped would be acceptable to the Council. Should this be implemented Council could be convinced to even support smaller lots of 1000 to 1500m² to act as a buffer to the kennel area.

9 Consistency with the Jandakot Land Use and Water Management Strategy

9.1 Comment *The proposal is inconsistent with the Jandakot Land Use and Water Management Strategy which details permitted land uses over the Jandakot Mound.*

Response The JLU&WMS is a draft document which proposes land uses and has not been implemented and as such it does not detail permitted land use. During the public comment phase of the strategy, there is provision for review and this proposal provides a such a review. The response to comment 1.1 above is also relevant. Furthermore, recent proposals within the South West Corridor Stage 'A' MRS Amendment propose further urban expansion within the JLU & WMS area.

10 Comment Wetland protection and Drainage

10.1 Comment *The water table will rise in response to the clearing of deep rooted native vegetation. This will cause greater surface inundation to the wetland areas causing unacceptable changes to the wetland vegetation.*

Response Clearing of vegetation will cause the water table to rise in the short-term. A preliminary water balance calculation prepared by the proponent indicates that in a worst-case scenario, the increase in groundwater level at a void co-efficient of 20% will be 0.85m which represents a significant change, given that groundwater currently lies between 0 and 1m below ground level where wetland vegetation currently occurs on the site. The increase in exposed water surface level in the wetland will be 0.17m which also represents a significant change given that annual inundation is currently 0.3m.

If these impacts persist in the long term, there could be possible changes to the wetland vegetation. However, the proponent suspects that WAWA production bore J120 has resulted in a lowering of groundwater levels in the wetland area. This effect combined with establishment of gardens and landscaping in the proposed urban development and retention of vegetation buffers on the larger lots will act to ameliorate the perceived impact.

10.2 Comment *The wetlands on the site have been categorised as category H and C according to EPA Bulletin 686. An EPA recommended management objective for these wetlands is to maintain and enhance the wetland attributes, particularly natural. Allowing a wetland area to be used for drainage purposes is not consistent with that management objective.*

Response Drainage plans for the proposal as outlined are preliminary only.

The proposed nutrient filter and recharge basin near the setback for the Water Authority extraction bore will be relocated outside the sumpland area. The basin near Nicholson Road is proposed to be located in a denuded area of complete degradation and would be designed and managed as a vegetated wetland habitat. This would not be a cosmetic lake. Design and management would be in accordance with Water Sensitive Design Guidelines Schedule of Best Management Practices, to the satisfaction of the Water Authority and CALM. The proponent makes the additional commitment:

6.15 The proponent will complete the design and location of the nutrient filter and recharge basins outside the sumpland area to the satisfaction of the Water Authority and CALM.

10.3 Comment *The CER has not demonstrated that the existing main drainage system has the capacity to carry the extra water draining from this site. The proponent should demonstrate that the drainage system has the required capacity.*

Response The proposed drainage system contains two catchments. The northern catchment has a compensated discharge into the Amherst Road Branch Drain and this is an approved catchment. The southern portion stormwater disposal is to be managed within the property and this will be achieved by soakage basins and recharge to the groundwater aquifer. The proposal does not include the construction of a drainage outfall and includes on site retention and recharge in accordance with current Strategic Drainage Planning philosophies.

11 Support for the proposal

11.1 Comment *The proposal is well designed and the location of the conservation area is complimentary to the development plans for the land directly to the south east.*

Response Acknowledged. However, the proponent is not aware of any development plans for land directly to the south-east further to the zoning as proposed in JLU&WMS.

12 Other

12.1 Comment *Currently, a Parliamentary Select Committee is studying land developments on groundwater mounds, and conditions may apply to future developments. Approval for this development should not be granted until that committee has reported its findings.*

Response The proponent has approached the Parliamentary Select Committee with the aims of presenting this proposal, providing detail on the issue generally and seeking advice. The proponent makes the additional commitment:

6.16 The proponent will incorporate the recommendations of the Select Committee into the final design.

12.2 Comment *The land was not identified in Metroplan for urban development but forms part of the rural wedge that separates the south west corridor from the south east corridor. This wedge is important to the preservation of the open landscape character and to provide definition to the built up area.*

Response One of the key Principles of Metroplan is to increase emphasis on Urban Containment and Suburban Renewal.

The Department of Planning and Urban Development's "Metropolitan Development Programme 1992-93 to 1996-97" July 1992, promotes:

"a more contained and sustainable pattern of metropolitan development. This means slowing corridor growth at the extremities of the urban fringe by developing land closer to services and employment opportunities in existing urban areas".

(p.2 Metropolitan Development Programme, 1992)

Subdivision of that part of Lots 122, 123 and 403 Acourt Road as proposed, complements the above-referred principle of Metroplan by proposing subdivision that is on the fringe of an existing urban area and can be economically serviced in the short term.

It is also proposed to set aside approximately 38ha of the land for future inclusion into the Botanical Park. This land would become a part of the "rural wedge" that separates the south east and south west corridors.

The effect of the proposal will be to more actively define the "urban" and "green rural" areas of this part of the metropolitan region and substantially implement Metroplan principles.

Appendix 3
List of Submitters

Department of Planning and Urban Development
Water Authority of Western Australia
Department of Conservation and Land Management
Conservation Council of Western Australia (Inc)
Friends of Forrestdale
Homeswest
Wetlands Conservation Society
Hart, Simpson and Associates Pty Ltd
Waterbird Conservation Group Inc
and three individuals.

Fourteen submissions were received during the public review period. The major issues raised in submissions from the public are as follows:

- conservation value of the *Banksia* woodland;
- conservation of wetlands, especially as habitat of the Southern Brown Bandicoot;
- noise impacts from Jandakot Airport and the nearby kennel zone; and
- protection of groundwater resources.

The Environmental Protection Authority's summarised list of issues raised through the public review phase and the proponent's response to those issues are included over the page.

The Environmental Protection Authority has included consideration of the public submissions and the response from the proponent within its assessment of the proposal.

Proposal to subdivide Jandakot AA Lots 122, 123 and 403 Account Road

Consultative Environmental Review

Assessment Number 803

A list of concerns and questions has been compiled from the submissions received during the period of public comment. The Environmental Protection Authority would appreciate responses to these concerns / questions as soon as possible. This list and the responses from the proponent will be reproduced in the Authority's report on the project to the Hon Minister for the Environment.

1. Protecting the integrity of the proposed Jandakot Botanic Park

- 1.1 The entire site has been identified for inclusion in the Park. If this site is allowed to be developed, even partially, for urban purposes it would set an undesirable precedent and lead to further loss of land in the Park.
- 1.2 The additions to the Park as proposed in the CER are contrary to sound ecological principles for protection of bushland areas: the size of areas to be protected should be maximised. The proposed conservation of 38 ha is too small making ongoing management difficult.

2. Loss of important upland (Banksia woodland) vegetation

- 2.1 Most of the Canning Vale ecosystem type has already been cleared for development. This site represents one of the last remaining examples of this ecosystem type. The upland vegetation would be entirely lost under this proposal. There are large areas of cleared land that should be developed in preference to this site.
- 2.2 The entire bushland area was identified as having high conservation value according to an independent report to the Department of Planning and Urban Development, and should be protected.
- 2.3 The Flora survey of the site indicates that some of the best bushland on the site is in the upland areas proposed for residential development. Why didn't the proponent take the advice of its independent consultant when selecting the area to be re-developed?
- 2.4 The Banksia-sheoak-jarraah community type is now the least common Banksia woodland community type on the Swan Coastal Plain. This site contains one the last significant stands of this community type and will be lost if this proposal proceeds.

3. Problems of management of the remaining bushland area following urban development

- 3.1 Allowing large numbers of residents so close to such a small area of bushland (the proposed 38 ha for conservation in the CER) would present significant management problems. Fire management would lead to loss of ecological value of the remnant bushland area though:
 - the requirement for larger than normal firebreaks, which would lead to a further loss of protected bushland area; and

- more frequent prescribed burning would need to be carried out to minimise fire risks to nearby residents. This would lead to a loss of ecological value of the bushland area through fire induced changes.

4. Inadequacies of the flora and fauna surveys

- 4.1 Whilst no rare or priority species of flora were found on the site, the report by the consultant was based on limited survey work, and a more thorough survey is required.
- 4.2 The fauna survey was only superficial and was unable to identify nocturnal mammals that may be present. A more thorough survey is required.
- 4.3 The CER claims that there is no sign of dieback infection. An examination of the site clearly shows that dieback is a problem. A more detailed survey should be carried out to assess the extent of the infection, and the proponent should then propose management measures to deal with the problem.

5. Protection of Groundwater resources

- 5.1 The proposed urban area is adjacent to a Water Authority bore. Pollution from the urban area would contaminate water being extracted through the bore.
- 5.2 A CSIRO study of the Gwelup bores showed that two of the 11 bores were heavily contaminated, and another three were substantially contaminated. There are inadequate controls over underground storage tanks to stop contamination of the groundwater, and urbanisation should not be allowed over groundwater mounds.
- 5.3 The subject land is within the Jandakot Underground Water Pollution Control Area (UWPCA), Priority 2 Source Area, where urban development is not the preferred land use. Increasing numbers of people in the area increases the possibility of negligent discharge of chemicals and other liquid wastes which will contaminate the groundwater.
- 5.4 There is an inaccuracy in the CER relating to Water Authority Bylaws. The Bylaws require a 300 m wellhead protection zone around each production well. The proposal does not comply with that Bylaw.
- 5.5 The CER indicated that it would use amended soil in the drainage basins to strip nutrients from the stormwater. The Water Authority opposes the use of "red mud" in UWPCA's because it contains chemicals which could leach into the groundwater making it unsuitable for human consumption.

6. On-going management of Jandakot Botanical Park

- 6.1 The CER claims that the "no development" option - the whole site being included in the Park - would lead to the further degradation of the bushland through lack of management. This would not happen if the community were to become involved in managing the area. EPA's Ecoplan provides individuals and community groups with the skills to manage remnant bushland areas.

7. Southern Brown Bandicoot

- 7.1 The bandicoot population is unlikely to survive the influx of dogs and cats associated with the proposed residential development.
- 7.2 The bandicoot prefers the heath vegetation associated with damplands (wetlands which are seasonally waterlogged). Removal of deep rooted native vegetation to allow development will cause the water table to rise which would increase the amount of surface inundation. This would alter the wetland vegetation to the extent that the bandicoot's habitat is destroyed.

8. Noise impacts

- 8.1 It is unwise to locate more residents near the Jandakot airport when existing residents are strong opposed to the airport remaining in its current location. The main concern is the noise from the aircraft.
- 8.2 The proposed 30m vegetated buffer between the kennel zone and the houses is inconsistent with previous advice from the Environmental Protection Authority. In its advice to the State Planning Commission regarding a proposed MRS Amendment in the Southern River area, the Authority recommended that a 1 km buffer should be provide between kennel zones and houses.

9. Consistency with Jandakot Land Use and Water Management Strategy

- 9.1 The proposal is inconsistent with the Jandakot Land Use and Water Management Strategy which details permitted land uses over the Jandakot Mound.

10. Wetland Protection and Drainage

- 10.1 The water table will rise in response to the clearing of deep rooted native vegetation. This will cause greater surface inundation to the wetland areas causing unacceptable changes to the wetland vegetation.
- 10.2 The wetlands on the site have been categorised as category H and C according to EPA Bulletin 686. An EPA recommended management objective for these wetlands is to maintain and enhance the wetland attributes, particularly natural. Allowing a wetland area to be used for drainage purposes is not consistent with that management objective.
- 10.3 The CER has not established that the existing main drainage system has the capacity to carry the extra water draining from this site. The proponent should demonstrate that the drainage system has the required capacity.

11. Support for the proposal

- 11.1 The proposal is well designed and the location of the conservation area is complimentary to the development plans for the land directly to the south east.

12. Other

- 12.1 Currently, a Parliamentary Select Committee is studying land developments on groundwater mounds, and conditions may apply to future developments. Approval for this development should not be granted until that committee has reported its findings.
- 12.2 The land was not identified in Metroplan for urban development but forms part of the rural wedge that separates the south west corridor from the south east corridor. This wedge is important to the preservation of the open landscape character and to provide definition to the built up area.

Appendix 4
Proponent's commitments

SUMMARY OF AMENDED COMMITMENTS

6.0 COMMITMENTS

The proponent makes the following commitments to the proposal to ensure the proper Environmental management of the proposal:

- 6.1** Contingencies to control dust from earthworks will be included in construction contract by the engineer for implementation by the construction contractor. The EPA Dust Control Guidelines and draft Smoke Control Guidelines will be implemented including a site management plan.
- 6.2** Signs notifying that the land is subject to aircraft noise will be erected at the boundary of the residential areas by the proponent to the satisfaction of the Federal Airports Corporation. Potential purchasers will also be notified by the proponent or his agent through a brochure containing information relevant to the site and the development.
- 6.3** Construction disturbance to the wetland and fringe areas will be prohibited. Temporary fencing and signs will be constructed where necessary by the proponent prior to construction as recommended by the future Park Manager.
- 6.4** A Drainage Management Plan will be documented prior to development and implemented during construction by the proponent to the satisfaction of the City of Canning and the Water Authority. The management plan will include Best Management Practices of Water Sensitive Design Guidelines.
- 6.5** The proponents will observe the Aboriginal Heritage Act. Heritage sites will be reported to the WA Museum and work would cease.
- 6.6** An information brochure will be issued to all interested and potential purchasers containing data on regional groundwater issues, the Jandakot Botanic Park and the need for management. The brochure would be prepared by the proponent and consultants.
- 6.7** A Management Plan for the appropriate portion of the Jandakot Botanic Park will be prepared by the proponent to the satisfaction of DPUD and CALM by the proponent at subdivision. The plan would address fencing, signs, drainage, replanting, rehabilitation, litter removal, weed control, access, fire control, buffers to production bores and other relevant issues.
- 6.8** The proponent will manage the relevant portion of the park for a period of two years from the issue of titles to conform with the management plan.
- 6.9** The proponent will fund a bandicoot population survey and a relocation programme in conjunction with CALM prior to development.
- 6.10** The proponent will undertake a dieback survey prior to subdivision in conjunction with CALM and implement all necessary control measures.
- 6.11** The proponent undertakes to comply with the Water Authority requirements for setbacks from production bore J120.

6.12 The proponent undertakes to obtain the approval of the Water Authority for any amended soils to be used in the drainage basins.

6.13 The proponent will derive maximum groundwater levels and soakage disposal systems in conjunction with the Water Authority and CALM.

6.14 The proponent will comply with AS2021 and require, by sales agreement and restrictive covenant to be registered on the title of all lots, the need for all dwellings to be built in accordance with the following standards:

- Double brick or masonry construction
- Clay or concrete roof tiles
- Boxed eaves
- 6mm glazing
- Solid core doors
- R2.5 rated insulation bats in the roof space

6.15 The proponent will complete the design and location of the nutrient filter and recharge basins outside the sumpland area to the satisfaction of the Water Authority and CALM.

6.16 The proponent will incorporate the recommendations of the Select Committee in the final design.

SUMMARY OF AMENDED COMMITMENTS

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The proponent makes the following commitments to the proposal to ensure the proper Environmental management of the proposal:

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- 6.2** Signs notifying that the land is subject to aircraft noise will be erected at the boundary of the residential areas by the proponent to the satisfaction of the Federal Airports Corporation. Potential purchasers will also be notified by the proponent or his agent through a brochure containing information relevant to the site and the development.
- 6.3** Construction disturbance to the wetland and fringe areas will be prohibited. Temporary fencing and signs will be constructed where necessary by the proponent prior to construction as recommended by the future Park Manager.
- 6.4** A Drainage Management Plan will be documented prior to development and implemented during construction by the proponent to the satisfaction of the City of Canning and the Water Authority. The management plan will include Best Management Practices of Water Sensitive Design Guidelines.
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- 6.9** The proponent will fund a bandicoot population survey and a relocation programme in conjunction with CALM prior to development.
- 6.10** The proponent will undertake a dieback survey prior to subdivision in conjunction with CALM and implement all necessary control measures.
- 6.11** The proponent undertakes to comply with the Water Authority requirements for setbacks from production bore J120.

MEMO TO: R K STEEDMAN via C SANDERS, A/CHIEF EXECUTIVE OFFICER
FROM: Garry Middle
SUBJECT: CHANGES TO ACOURT ROAD BULLETIN
DATE: 12 JULY 1994

Further to your comments on the above report, find enclosed the modified Bulletin and the original with your comments. ✓

Please note the following:

- Changes to groundwater sections are included (refer to pink stickers), but I did not alter the Recommendation. The Recommendation as written was endorsed by EPA. Should I take it back so your changes can be made? No ✓
- Wetland impacts section includes reference to rising watertable with urbanisation (p 7); ✓
- p12 - the 300m wellhead protection area has been clarified ✓
- p13 - the rural "wedge" has been clarified ✓
- Figure 1 amended as suggested; ✓
- Appendix 1 to be added by desktop publishing; ✓
- Appendix 2 - This includes a copy of the original list of issues as sent to the proponent and a copy of the reply from the consultant for the proponent. It is felt that both are important to include in their original format rather than edit one or the other to avoid repetition. ✓

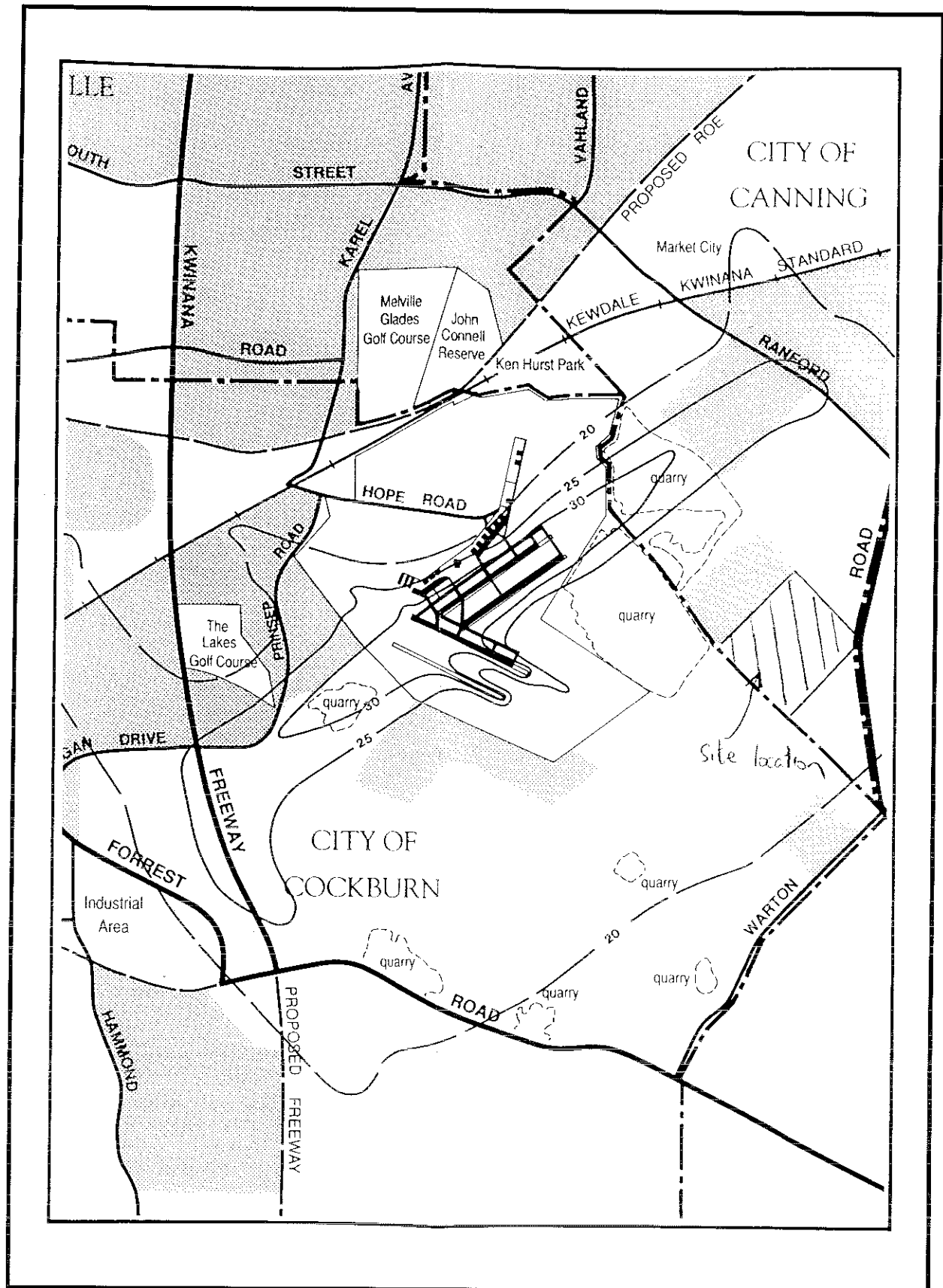


Figure 4: Australian Noise Exposure Forecast, Jandakot Airport (from Dames & Moore, 1993)