

Superlot Subdivision Lots 4 and 105 Underwood Avenue, Shenton Park

**University of Western Australia
Water Corporation**

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

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Summary and recommendations

The University of Western Australia (UWA) and the Water Corporation propose to subdivide Lots 4 and 105 Underwood Avenue, Shenton Park into three superlots for clearing and development. This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for the Environment and Heritage on the environmental factors relevant to the proposal.

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

Relevant environmental factors

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

- (a) Regionally significant bushland identified in Bush Forever; and
- (b) Odour from the Subiaco Wastewater Treatment Plant.

Conclusion

The EPA has considered the proposal by the University of Western Australia and the Water Corporation to subdivide Lot 4 and Lot 105 Underwood Avenue, Shenton Park into three superlots.

The EPA considers that the primary issue in assessing the environmental acceptability of this proposal is to ensure that an adequate conservation area is set aside to protect the core (highest conservation) values of the Bushplan Site. This includes the values of the vegetation itself as well as the habitat and ecological linkage values it provides for fauna.

The proponents have proposed to set aside a Conservation Area of 12 hectares within the proposed Lot 3, consisting of 9.4 hectares of bushland rated as 'Good' or better than 'Good' condition in two areas of 3.6 and 5.8 hectares, separated by an area rated as 'Completely Degraded'. The proponents have also committed to rehabilitate the bushland in 'Good' condition to 'Very Good' condition and the 'Completely Degraded' vegetation to 'Good' condition.

The EPA notes that the proposed Conservation Area provides for the protection of a diversity of structural vegetation units and includes the main populations of the Priority 3 species, *Jacksonia sericea* and the stand of *Eucalyptus decipiens*. The habitats present in the Conservation Area are likely to be suitable for all the vertebrate species recorded at the site. The Conservation Area also provides for a number of ecological linkage opportunities.

However, the EPA considers that the proposed Conservation Area in its current state does not provide for adequate protection of the core (highest conservation) values of the Bushplan Site in terms of the condition of the vegetation protected. This, and the shape of the Conservation Area means that more intensive management will be required to improve and maintain its conservation values in the long term.

In order to address the issues of vegetation condition and management of the Conservation Area the EPA has taken a precautionary approach to stage clearing and development through stringent conditions. Conditions have been recommended to set aside an additional 2.6 hectare area, equal to the area of 'Completely Degraded' land within the proposed Conservation Area, to be managed as part of the Conservation Area until such time as the 'Completely Degraded' land has been rehabilitated to 'Good' or better than 'Good' condition.

With regard to odour impacts from the Subiaco Wastewater Treatment Plant, the EPA considers that there is reasonable certainty that at least the proposed Lot 1 will become suitable for residential development after planned improvements to the WWTP have been implemented. Conditions have been recommended to ensure that clearing and/or development does not occur until it is demonstrated that an acceptable amenity for residential use, that is 5 odour units at 99.9 percentile, will be experienced at the site.

The EPA has therefore concluded that it is unlikely that the EPA's objectives would be compromised provided there is satisfactory implementation by the proponent of the proponent's commitments and the recommended conditions set out in Appendices 3 and 4 and summarised in Section 5.

Recommendations

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

1. That the Minister notes that the proposal being assessed is for subdivision of Lots 4 and 105 Underwood Avenue, Shenton Park into three superlots for clearing and development;
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3;
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4, and summarised in Section 5, including the proponent's commitments.
4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

Conditions

Having considered the proponent's commitments and information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by the University of Western Australia and the Water

Corporation to subdivide Lot 4 and Lot 105 Underwood Avenue, Shenton Park into three superlots is approved for implementation. These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

- (a) That the proponent be required to fulfill the commitments in the Proponent's Commitments statement set out in Appendix 3;
- (b) There shall be no clearing or development on Lots 1 or 2 except in areas where it is demonstrated by the proponent, to the satisfaction of the Minister for the Environment and Heritage, on the advice of the EPA, that the 5 odour unit at 99.9 percentile has been met.
- (c) There shall be no clearing of Lot 2, other than for roads, public open space, infrastructure or firebreaks considered necessary for the development of Lot 1, until the proponent has carried out rehabilitation in those areas of the Conservation Area which are currently in 'Good' and better than 'Good' condition and has brought them up to 'Very Good' condition, based on the current vegetation condition as mapped in Figure 3.
- (d) An area of at least 2.6 hectares within Lots 1 and/or 2 will be identified and not become available for clearing or development until the area in the Conservation Area, which is in less than 'Good' condition (2.6 hectares), has been rehabilitated to at least 'Good' condition. This identified area should be in 'Good' or better than 'Good' condition, be located adjacent to the 12 hectare Conservation Area, and be managed as part of the Conservation Area during this period.
- (e) Before any clearing or development of Lots 1, 2 or 3, the proponent shall develop criteria and methodology against which vegetation condition can be assessed using an acceptable scientific method.
- (f) The following management plans outlined in the recommended environmental conditions presented in Appendix 4, which include:
 - Conservation Area Management Plan;
 - Landscape Management Plan; and
 - Fire Suppression and Management Plan.
- (g) An appropriate instrument (e.g. conservation covenant, vesting) should be established to ensure that the retained bushland and rehabilitated native vegetation in the conservation area is secured and managed for conservation purposes in perpetuity.

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1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment and Heritage on the environmental factors relevant to the proposal, by the University of Western Australia (UWA) and the Water Corporation, to subdivide Lots 4 and 105 Underwood Avenue, Shenton Park into three superlots for clearing and development. The Water Corporation is registered as a joint proponent due to its ownership of Lot 105, the sewer easement through Lot 4.

The proposal is a different proposal to that assessed by the EPA and on which the EPA reported to the Minister for the Environment and Heritage in November 2001 (EPA Bulletin 1034).

It was referred to the EPA by Minter Ellison Lawyers on the behalf of the proponents on 5 December 2002. The proposal, as referred, is provided as Figure 1. The environmental issues relevant to the proposal are protection of regionally significant vegetation identified in *Bush Forever* (Government of Western Australia 2000) and odour from the Subiaco Wastewater Treatment Plant (WWTP).

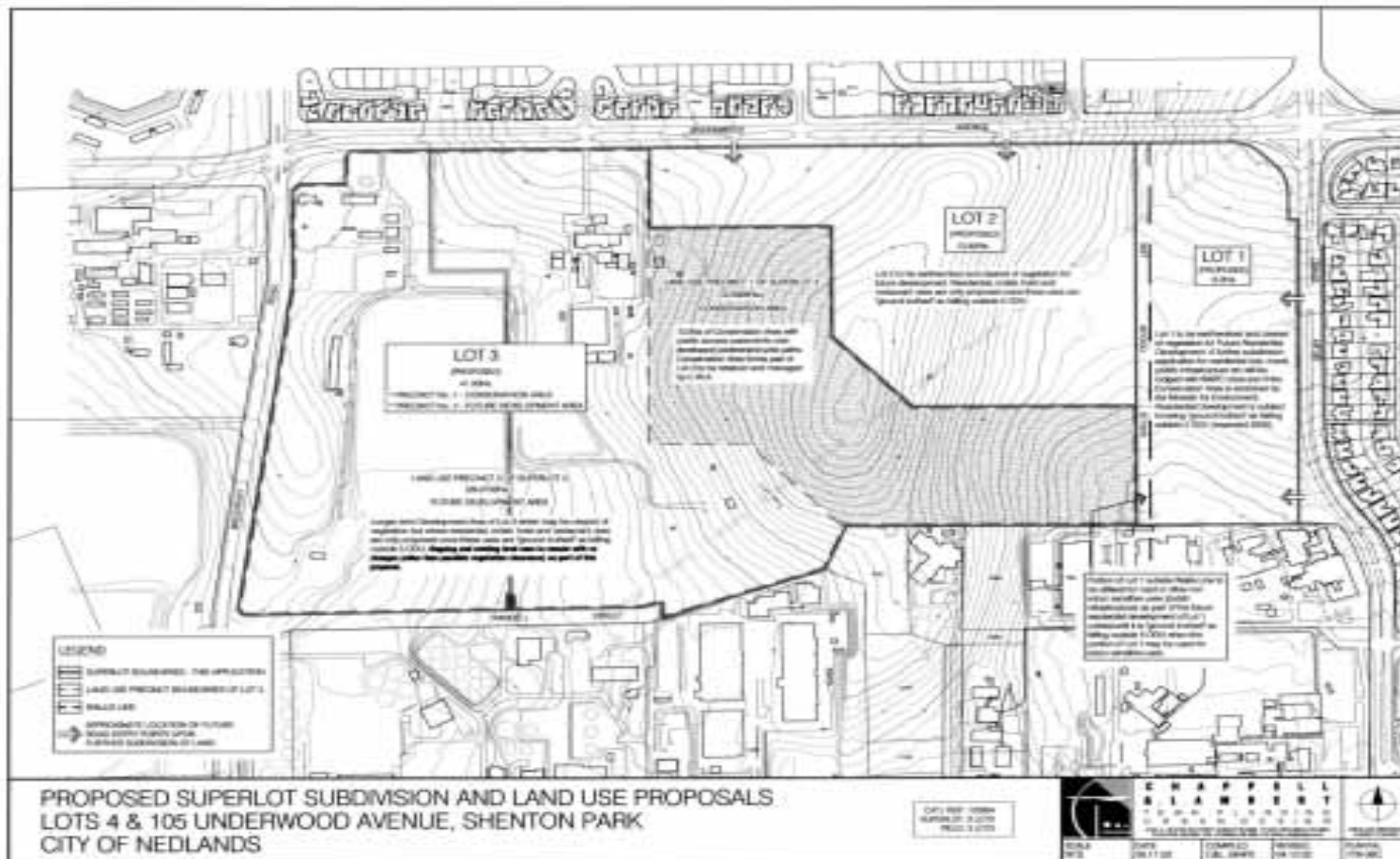
On receiving the referral and in accordance with *Advice on Aspects of Bush Forever* (EPA 2001a), the EPA requested that the proposal be considered by the Bush Forever interagency coordination group, prior to it determining whether or not to assess the proposal, and if so, at what level.

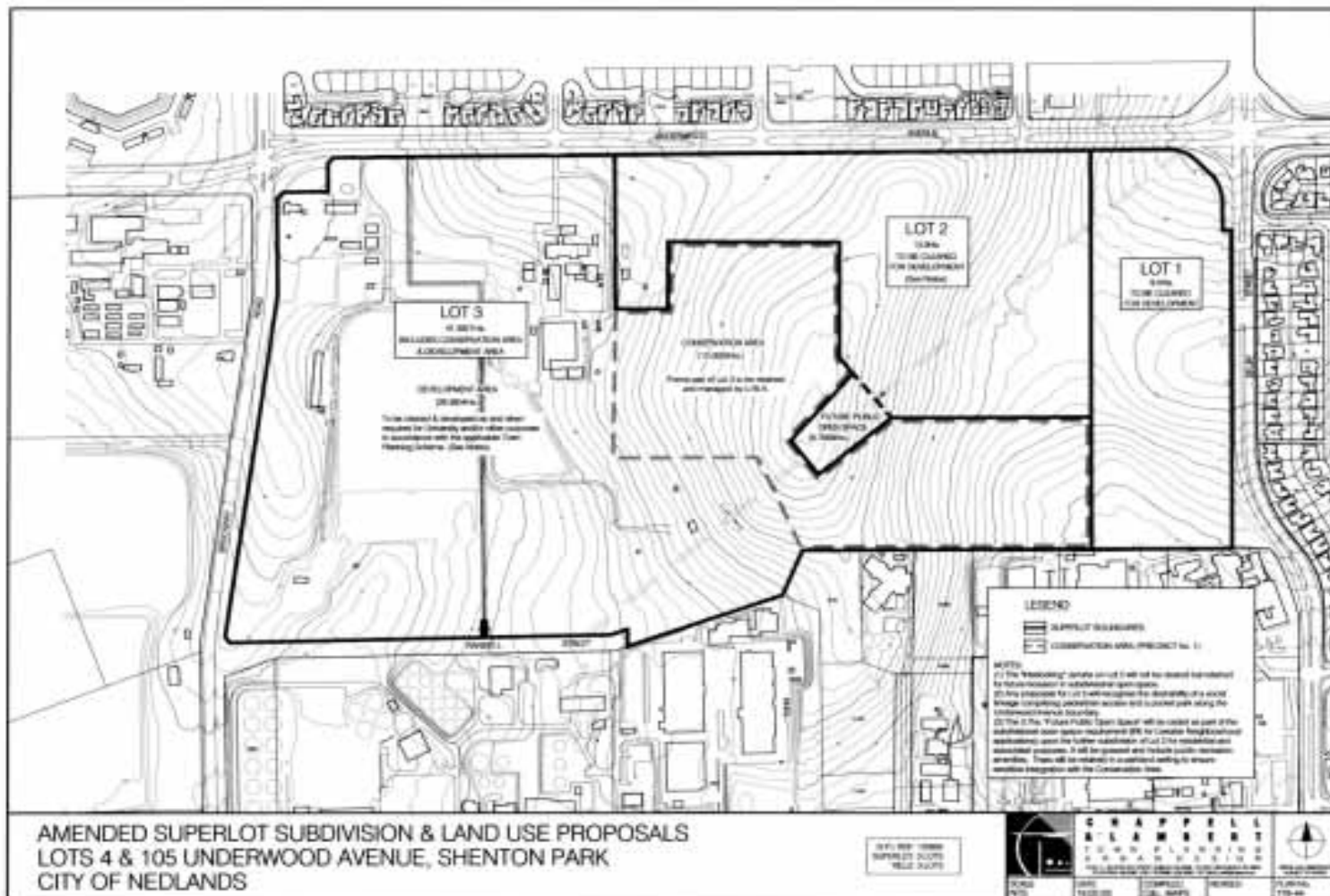
The EPA received the advice of the Bush Forever inter-agency technical coordination group on 5 March 2003. The full report is provided as Appendix 1. It is understood that the group met with representatives of the UWA on several occasions, conducted site visits and undertook limited botanical survey of the Underwood Avenue Bushland. While the proposal was amended by the proponent, the process did not result in an agreed negotiated outcome. The revised proposal is the current proposal being assessed by the EPA and is provided in Figure 2.

The UWA advertised the current proposal and supporting documentation for public comment from 24 February to 7 March 2003 and received 149 public submissions. The UWA's response to submissions is provided as Appendix 2 as a matter of information only and does not form part of the EPA's report and recommendations. Issues arising from this process and which have been taken into account by the EPA appear in the report itself. While community consultation was encouraged by the EPA, the process of consultation undertaken by the UWA was not a direction of, nor was it endorsed by, the EPA.

The UWA forwarded each of the submissions to the EPA and additional submissions were directly forwarded to the EPA.

The EPA has examined each of the submissions received, the summary prepared by the UWA, as well as an additional summary of submissions collated by the Friends of Underwood Avenue Bushland Inc.





The key environmental issues raised in public submissions are summarised below:

- Alternatives for funding and development e.g. levy, land swaps;
- Loss of habitat for fauna including Carnaby's Cockatoo, Little Eagle;
- Loss of biodiversity, Jarrah, Tuart and Banksia woodlands;
- Impacts of surrounding residential land use including predation by pets, fire, weed invasion, mountain bikes and trail bikes;
- Subiaco wastewater treatment plant - odour impacts, visual impact of 50 metre chimney, bushland as buffer, chlorine storage;
- Social impacts - amenity value, sense of well-being, sense of place;
- Reduction of linkage between Bold Park and Kings Park, city to ocean;
- Most of best bushland not protected;
- Not of sufficient size or shape to maintain biodiversity, not compliant with current best practice for bushland management;
- Questioning of success of rehabilitation, cost, once surrounding bushland is cleared there will be no genetic material for restoration;
- Aboriginal cultural values;
- Submission/consultation process – too short, inaccurate information provided, community views ignored by the UWA;
- Karrakatta Central and South vegetation complex, not enough remaining to meet targets; and
- Questioning of UWA's commitment to manage, not demonstrated by past activities, ongoing management cost.

The EPA considers that legally binding conditions are required to address the issues of protecting regionally significant vegetation and odour, and thus determined that the proposal should be formally assessed under Part IV of the *Environmental Protection Act 1986*. A formal level of assessment is also consistent with EPA Guidance No. 10 *Level of assessment for proposals affecting natural areas within the System 6 region and Swan Coastal Plain portion of the System 1 Region* (EPA 2003).

The EPA considers that substantial community comment has been received and stakeholder consultation undertaken throughout the EPA's consideration of the current, and previous proposals for the site. The EPA notes that the community is not altogether satisfied with the consultation process undertaken to date. However, the EPA is of the view that an assessment including public consultation would be unlikely to raise new issues. Consequently, the level of assessment of 'Formal Under Part IV' has been set concurrently with the release of this report. There is a right of appeal on this level of assessment as well as the EPA's advice in this report.

Further background of the EPA's consideration of previous proposals at the site is provided in Section 2. The details of the current proposal are presented in Section 3 of this report. Section 4 discusses the environmental factors relevant to the proposal. The Conditions and Commitments to which the proposal should be subject, if the Minister determines that it may be implemented, are set out in Section 5. Section 6 presents the EPA's conclusions and Section 7, the EPA's Recommendations.

2. Background

In November 2001 the EPA provided a Report and Recommendations to the Minister for the Environment and Heritage on the UWA's proposal to subdivide a portion of Lot 4 corner Underwood Avenue and Selby Street, Shenton Park to enable residential development. This previous proposal included an 8.5 hectare conservation area. The level of assessment was set at 'Formal Under Part IV' concurrently with the publication of the EPA's Report and Recommendations (Bulletin 1034, EPA 2001b). At this time the EPA concluded that it was not acceptable to proceed with the residential development as it was not possible to demonstrate with reasonable certainty that acceptable levels of odour will be achieved, and the proposed conservation area was inadequate to protect the core (highest conservation) values of the Bushplan Site. However, the EPA considered that the buffer recommended by Consulting Environmental Engineers (2001), the 'Wallis' buffer, was a reasonable interim approach for land use planning in the vicinity of the WWTP. The EPA also recommended that a larger area should be set aside for conservation, but not substantially so.

In determining several appeals on both the level of assessment and the content of the EPA's Report and Recommendations, the Minister remitted the proposal back to the EPA under the provisions of section 101(1)(b)(ii) of the *Environmental Protection Act 1986* and made a direction under section 43 of the Act.

In August 2002 the Western Australian Planning Commission (WAPC) refused this previous subdivision proposal based on several planning and environmental reasons. The proponent (UWA) lodged an appeal to the Town Planning Appeals Tribunal, against the WAPC's decision. As part of the process to determine the appeal the UWA, Water Corporation, WAPC and EPA entered into a mediation process. The EPA was represented in the mediation process in order to provide background of the environmental impact assessment process. The mediation resulted in an alternative development concept and a Mediation Agreement, signed by a representative of each of the parties. The EPA, so as to ensure its independence, did not provide endorsement of the alternative development plan. Furthermore, the Crown Solicitor's Office has advised the EPA that the agreement "does not attempt to derogate from the statutory discretion vested in the EPA and the WAPC under their respective legislation. The only undertaking made by the EPA is to progress the assessment of the new proposal with all reasonable expedition. Even that undertaking is expressed to be subject to the EP (Environmental Protection) Act."

As a result of the Mediation Agreement, the UWA requested that the EPA's consideration of the proposal be suspended until further notice. The new proposal, in its initial form, was then referred to the EPA as described in Section 1 above.

3. The proposal

The proposal area consists of 64.3 hectares of land in Shenton Park bounded by Underwood Avenue to the north, Brockway Road to the west, Selby Street to the east and the unmade Randell Street in the south. The proposal area currently contains the UWA's Agricultural Research Station and bushland. Lot 4 is owned by the UWA freehold and Lot 105 (sewer easement) is owned by the Water Corporation freehold.

It is understood that the land was vested in the Trustees of University Endowment by the Governor in 1908. It has been zoned 'Urban' under the Metropolitan Region Scheme (MRS) since the inauguration of the MRS in 1963, and 'Development Zone' in the City of Nedlands Town Planning Scheme No. 2 since 1985. Both of these zones allow for a range of land uses, including residential.

The superlot subdivision proposal divides the area into three large lots including a 12 hectare Conservation Area. Lot 1 consists of all land outside of the odour buffer for the Subiaco Wastewater Treatment Plant (WWTP) as recommended by Consulting Environmental Engineers (2001) and endorsed by the EPA as a reasonable interim guide for land use planning (the 'Wallis' buffer). The buffer represents the predicted 5 odour unit contour after completion of improvements to the Subiaco WWTP. Lot 1 is proposed to be cleared of all remnant native vegetation for predominantly residential development with lot densities ranging from R20 to R40, which equates to lot sizes of between 200 and 500 square metres. The area of Lot 1 is 9 hectares. Lot 1 is proposed as the first stage of development of the proposal area after improvements to the WWTP have been completed.

Lot 2 is proposed to be cleared of all remnant native vegetation for development, with the exception of the interlocking Jarrahs to be retained in local open space. Lot 2 is situated within the predicted odour buffer for the Subiaco WWTP and so the extent of residential development is dependent on final modelling of the 5 odour unit contour on completion of improvements to the WWTP. A 0.7 hectare Future Public Open Space area is located with three sides adjacent to the Conservation Area boundary. The area of Lot 2 is 13.9 hectares.

Lot 3 includes the 12 hectare proposed Conservation Area with the remainder of the lot to be cleared and developed to maintain and expand the UWA's Agriculture Field Station in the short to medium term, with the potential for residential/mixed use development and non residential development in the longer term. Any proposals will recognise the desirability of a social linkage comprising pedestrian access and a pocket park along the Underwood Avenue boundary. The total area of Lot 3 is 41.4 hectares

The proposal assessed by the EPA is provided as Figure 2.

4. Relevant environmental factors

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

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

- (a) Regionally significant bushland identified in *Bush Forever*; and
- (b) Odour.

Details on the relevant environmental factors and their assessment are contained in Sections 4.1 and 4.2. The description of each factor shows why it is relevant to the proposal and how it will be affected by the proposal. The assessment of each factor is where the EPA decides whether or not a proposal meets the environmental objective set for that factor.

4.1 Regionally significant bushland identified in *Bush Forever*

Description

The proposal area contains regionally significant bushland identified as Site 119 Underwood Avenue Bushland, Shenton Park in *Perth's Bushplan* (Government of Western Australia 1998) and *Bush Forever* (Government of Western Australia 2000).

As a site zoned 'Urban' under the Metropolitan Region Scheme, the *Bush Forever* Site has been identified to be implemented through a negotiated planning solution. With particular reference to those sites identified as negotiated planning solutions, the EPA has stated in its report *Advice on Aspects of Bush Forever* (EPA 2001a), that:

...the EPA would expect a reasonable outcome through the negotiated planning solution process administered by the Ministry for Planning. In this context the EPA considers that a "reasonable outcome" is where the core (highest conservation value) area/s and threatened ecological communities are protected. Recognising the constraints applying to these Sites, the objective should be to protect as much bushland as possible.

The vegetation condition has been revised during the consideration of the proposal by the *Bush Forever* inter-agency technical coordination group, consistent with the vegetation condition scale utilized in *Bush Forever*. The proponent has agreed that this is representative of the current condition of the vegetation within the Bushplan Site. The revised vegetation condition mapping is provided as Figure 3. The 12 hectare proposed Conservation Area consists of 9.4 hectares of bushland rated as 'Good' or better than 'Good' condition essentially in two areas (of 3.6 and 5.8 hectares) separated by an area rated as 'Completely Degraded'.

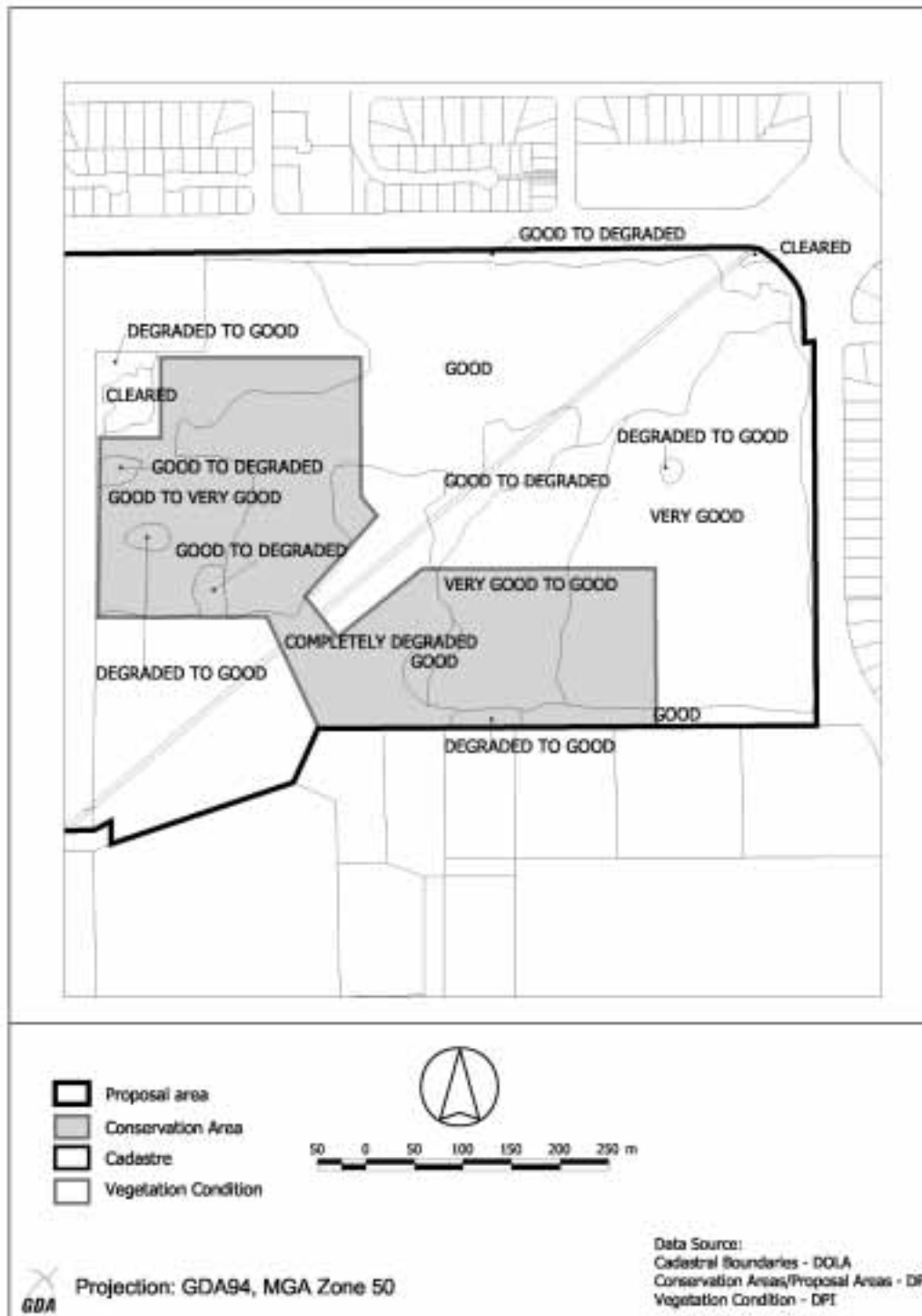


Figure 3: Vegetation condition and the proposed Conservation Area

The proposed Conservation Area includes bushland representative of the Karakatta Central and South vegetation complex and floristic community type 28. The area contains seven of the eight structural vegetation units within the Bushplan Site, and includes the stand of *Eucalyptus decipiens*, a small pocket of *Banksia prionotes* Closed Scrub and the main areas of the Priority 3 species *Jacksonia sericea* as mapped by ATA Environmental (2001), although this latter species is also scattered throughout the Bushplan Site.

The EPA notes that *Bush Forever* (Government of Western Australia 2000) is proposing to protect less than 10% of the original extent of the Karakatta Central and South vegetation complex within the study area due to past commitments and approvals reducing the area available for conservation. *Bush Forever* notes that there may be opportunities outside of the Perth Metropolitan Region to secure additional or substitute sites. The EPA is cognisant of this issue in its evaluation of proposals affecting the Karakatta Central and South vegetation complex outside of the *Bush Forever* study area.

Assessment

In assessing the adequacy of the proposed Conservation Area in protecting the core (highest conservation) areas of the Bushplan Site, the EPA has considered the values of the vegetation itself as well as the habitat and ecological linkage values it provides for fauna.

Bush Forever interagency technical coordination group advice

The EPA has noted the advice of the Bush Forever interagency technical coordination group and compared the proposed Conservation Area to the area previously determined by the EPA in November 2002. This is provided in Appendix 1 for information only and does not form part of the EPA report and recommendations. The coordination group review has been undertaken using the criteria for identifying bushland of regional significance as utilised in *Bush Forever* (Government of Western Australia 2000), that is:

1. Representation of ecological communities;
2. Diversity;
3. Rarity;
4. Maintaining ecological processes and natural systems;
5. Scientific or evolutionary importance;
6. General criteria for the protection of wetland, streamline and estuarine fringing vegetation and coastal vegetation; and
7. Criteria not relevant to determination of regional significance, but which may be applied when evaluating areas having similar values ie. Social or planning criteria.

Remnant vegetation

The proposed Conservation Area consists of 12 hectares of land in an L-shaped configuration. At a regional scale the bushland is representative of the Karakatta Central and South vegetation complex and floristic community type 28. The Conservation Area includes a range of structural vegetation units described by ATA Environmental (ATA 2000) as follows:

1. *Banksia menziesii* and *B. attenuata* Low Woodland over *Allocasuarina fraseriana* and *Hakea prostrata*;
2. *Eucalyptus marginata* and *E. gomphocephala* Open Woodland over *Acacia saligna*, *A. rostellifera* and *Hakea prostrata*;
3. *Eucalyptus marginata* Open Woodland over *Banksia menziesii* Low Woodland;
4. *Eucalyptus marginata* Low Woodland over a *Banksia attenuata*, *B. menziesii* and *Allocasuarina fraseriana* Low Woodland;
5. *Banksia prionotes* Closed Scrub with *B. menziesii* and *B. attenuata*;
6. Scattered *Eucalyptus decipiens* trees; and
7. *Jacksonia furcellata* and *Hakea prostrata* Tall Open Scrub which was not defined by ATA Environmental (ATA 2000) but identified by the Bush Forever interagency technical coordination group.

The 12 hectare proposed Conservation Area consists of 9.4 hectares of bushland rated as 'Good' or better than 'Good' condition essentially in two areas (of 3.6 and 5.8 hectares) separated by an area rated as 'Completely Degraded' which is proposed to be rehabilitated by the UWA. The EPA considers that rehabilitation of areas of vegetation from 'Good' to 'Very Good' condition is achievable, largely through the removal of exotic plant species. However, the EPA is unaware of successful examples of rehabilitation of land that supports native vegetation in 'Completely Degraded' condition to native vegetation, representative of the previous vegetation, in 'Good' or better condition, on the Swan Coastal Plain. The UWA has committed its considerable scientific expertise and resources to achieve this outcome.

The EPA notes that the current proposed Conservation Area provides for the protection of a diversity of structural vegetation units and includes the main populations of the Priority 3 species, *Jacksonia sericea* and the stand of *Eucalyptus decipiens*.

However, the EPA considers that the proposed Conservation Area in its current state does not provide for adequate protection of the core (highest conservation) values of the Bushplan Site in terms of the condition of the vegetation protected. This, and the shape of the Conservation Area means that more intensive management will be required to improve and maintain its conservation values in the long term.

The EPA appreciates that there is value in attempting to rehabilitate the 2.6 hectare area that is currently in 'Completely Degraded' condition to native vegetation representative of the previous vegetation in 'Good' or better condition, for the benefit of this proposal and revegetation science generally. However, in recognising the uncertainty of achieving this target, the EPA recommends that an additional area of at least equivalent size (i.e. 2.6 hectares) be set aside and managed as part of the Conservation Area in the interim. This additional area should comprise native vegetation in 'Good' or better than 'Good' condition and be located adjacent to the Conservation Area. This area would stay in the Conservation Area until successful rehabilitation is completed.

The EPA also recommends that criteria and methodology against which vegetation condition can be assessed, should also be developed. This should be based on an acceptable scientific method using a plot based assessment and the vegetation condition scale outlined in *Bush Forever*.

Fauna

Bushland within the proposed subdivision is known to support a range of vertebrate species including at least 37 bird species, 16 reptile species and 3 amphibian species. All of these are known from a number of bushland sites in the Perth Metropolitan area.

One bird species, Carnaby's Cockatoo is currently listed on Schedule 1 in the *Wildlife Conservation (Specially Protected Fauna) Notice 2003* and several other bird species including the Painted Button-quail, Brown Goshawk, Collared Sparrowhawk, Weebill, Varied Sittella and Yellow-rumped Thornbill have reduced distributions or declining population levels on the Swan Coastal Plain as a result of urbanization and other disturbance factors (Government of Western Australia 2000).

In assessing whether the proposed Conservation Area is adequate in protecting the fauna values of the site, the EPA has considered the fauna habitats present, the size of the proposed Conservation Area and role of the site as an ecological linkage. The threatened Carnaby's Cockatoo is an autumn and winter feeding visitor to the site and mainly feeds on the seeds of *Banksia* species which are present in the proposed Conservation Area. The habitats present in the proposed Conservation Area are likely to be suitable for all the vertebrate species currently recorded from the site.

The size of the current proposed Conservation Area is important for reptile populations as there is a known strong relationship between the number of reptile species occurring on bushland remnants and the size of the remnant, with larger remnants having more species (How and Dell 2000). The current proposed Conservation Area provides for ecological linkage opportunities southwards to Shenton Bushland.

Management of the Conservation Area and other conservation values

The EPA also proposes that stringent conditions are applied to ensure that the Conservation Area is well managed to protect its conservation values and to ensure that vegetation over the balance of the site is not cleared if it is not able to be developed for residential purposes due to the constraint of odour from the Subiaco Wastewater Treatment Plant.

The EPA is proposing that a staged approach be enforced through conditions so that there is no clearing or development of the proposal area until an appropriate instrument (e.g. a conservation covenant, vesting) is established to ensure that the retained bushland and rehabilitated native vegetation in the Conservation Area is secured and managed for conservation purposes in perpetuity. Before clearing or development of the proposal area, the following management plans should also be prepared:

- Conservation Area Management Plan – to ensure active management of the Conservation Area for the purpose of increasing and then maintaining its conservation values;
- Fire Suppression and Management Plan - to protect the values of the Conservation Area and surrounding land uses from fire; and
- Landscape Management Plan – to maintain and enhance ecological linkages and habitat between the Conservation Area and other regionally significant vegetation areas.

Conclusion

With stringent conditions to ensure a staged approach, rehabilitation, management and security of the Conservation Area in perpetuity, it is the EPA's opinion that the proposal can be managed to meet the EPA's objective for regionally significant vegetation identified in Bush Forever as a negotiated planning solution, to protect the core (highest conservation) values of the Bushplan Site.

4.2 Odour

Description

The proposal area is currently effected by odour from the Subiaco Wastewater Treatment Plant (WWTP). The EPA's assessment of the UWA's previous proposal to subdivide Pt Lot 4 Underwood Avenue/Selby Street, Shenton Park for residential development included detailed consideration of the odour impacts of the WWTP and improvement works being implemented by the Water Corporation to reduce the area adversely impacted by odour.

A level of odour considered to provide for a reasonable amenity from this type of source is 5 odour units at 99.9 percentile which equates to being free of odour for all but 8 hours/year. This is currently experienced at up to two kilometres from the plant. The odour control works are expected to reduce this distance to the buffer predicted by CEE (2001), the 'Wallis' buffer, and recommended by the EPA (2001b) to be used as an interim guide for land use planning in the area.

The main odour control works are planned to be implemented by the end of 2003. This includes odour control and upgrade work on the lime amended sludge plant, three primary settlement tanks, preliminary treatment area, dissolved air flotation thickeners, aeration tanks 4 to 11 and all interconnecting channels. Ongoing works on empty tanks will continue until June 2004. Following the completion of the main odour control works at the end of 2003, a detailed monitoring period of 12 months will follow, to assess the effectiveness of the works. This monitoring will include odour sampling, customer surveys and assessment of complaints data together with revised odour modelling. It is expected that the Water Corporation will be in a position to seek EPA and WAPC endorsement of the actual buffer in early to mid 2005.

The Water Corporation is confident that the current odour control program will ensure that odour targets will be achieved at the Wallis line, thereby protecting existing residents from unacceptable odour impacts and allowing for residential development of the proposed Lot 1. In addition, the Water Corporation is committed to take additional measures to reduce odour impacts to the Wallis line if the current program does not have this effect. However, the Water Corporation expects that the program will result in all of Lot 1, and potentially part of Lot 2 having a suitable amenity for residential development with regard to odour.

Assessment

The EPA's objective in regard to odour as it relates to this proposal is to ensure that any new developments in the vicinity of the plant does not result in people being

subject to odour levels that unreasonably interfere with their health, welfare, convenience, comfort or amenity.

In the EPA's assessment of the previous proposal by the UWA to subdivide a portion of Lot 4 Underwood Avenue/ Selby Street, Shenton Park for residential development (EPA 2001b), the EPA concluded that it was "unlikely that the proposal could be implemented to meet the EPA's objective for odour as it has not been possible to demonstrate with reasonable certainty that acceptable levels of odour for residential development will be achievable".

Since this time, the Water Corporation has collected on-site meteorological data and emissions data, and a Works Approval has been issued by the Department of Environmental Protection for the improvements to the WWTP to reduce odour impacts. Additional modelling has been undertaken and the Water Corporation has committed to achieving the 'Wallis' buffer, giving more certainty to the ability of at least the proposed Lot 1 to be made suitable for residential development.

Provided that odour sensitive development within the proposal area is staged as the odour impact from the WWTP is reduced and becomes acceptable, it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for odour. To ensure that this occurs, the EPA is recommending that a condition requires that the proponent demonstrate that 5 odour units is achieved before that part of the proposal area is permitted to be cleared or developed.

5. Conditions and Commitments

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

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

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

5.1 Proponent's commitments

The proponent has submitted commitments to the EPA during the EPA's consideration of the proposal. These are shown in Appendix 3, and should be made enforceable.

5.2 Recommended conditions

Having considered the proponent's commitments and the information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by the University of Western Australia and the Water Corporation to subdivide Lot 4 and Lot 105 Underwood Avenue, Shenton Park into three superlots is approved for implementation.

These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

- (a) That the proponent be required to fulfill the commitments in the Proponent's Commitments statement set out in Appendix 3;
- (b) There shall be no clearing or development on Lots 1 or 2 except in areas where it is demonstrated by the proponent, to the satisfaction of the Minister for the Environment and Heritage, on the advice of the EPA, that the 5 odour unit at 99.9 percentile has been met.
- (c) There shall be no clearing of Lot 2, other than for roads, public open space, infrastructure or firebreaks considered necessary for the development of Lot 1, until the proponent has carried out rehabilitation in those areas of the Conservation Area which are currently in 'Good' and better than 'Good' condition and has brought them up to 'Very Good' condition, based on the current vegetation condition as mapped in Figure 3.
- (d) An area of at least 2.6 hectares within Lots 1 and/or 2 will be identified and not become available for clearing or development until the area in the Conservation Area, which is in less than 'Good' condition (2.6 hectares), has been rehabilitated to at least 'Good' condition. This identified area should be in 'Good' or better than 'Good' condition, be located adjacent to the 12 hectare Conservation Area, and be managed as part of the Conservation Area during this period.
- (e) Before any clearing or development of Lots 1, 2 or 3, the proponent shall develop criteria and methodology against which vegetation condition can be assessed using an acceptable scientific method.
- (f) The following management plans outlined in the recommended environmental conditions presented in Appendix 4, which include:
 - (g) Conservation Area Management Plan;
 - (h) Landscape Management Plan; and
 - (i) Fire Suppression and Management Plan.
- (j) An appropriate instrument (e.g. conservation covenant, vesting) should be established to ensure that the retained bushland and rehabilitated native vegetation in the conservation area is secured and managed for conservation purposes in perpetuity.

6. Conclusions

The EPA has considered the proposal by the University of Western Australia and the Water Corporation to subdivide Lot 4 and Lot 105 Underwood Avenue, Shenton Park into three superlots.

The EPA considers that the primary issue in assessing the environmental acceptability of this proposal is to ensure that an adequate conservation area is set aside to protect the core (highest conservation) values of the Bushplan Site. This includes the values of the vegetation itself as well as the habitat and ecological linkage values it provides for fauna.

The proponents have proposed to set aside a Conservation Area of 12 hectares, consisting of 9.4 hectares of bushland rated as 'Good' or better than 'Good' condition in two areas of 3.6 and 5.8 hectares, separated by an area rated as 'Completely Degraded'. The proponents have also committed to rehabilitate the bushland in 'Good' condition to 'Very Good' condition and the 'Completely Degraded' vegetation to 'Good' condition.

The EPA notes that the proposed Conservation Area provides for the protection of a diversity of structural vegetation units and includes the main populations of the Priority 3 species, *Jacksonia sericea* and the stand of *Eucalyptus decipiens*. The habitats present in the Conservation Area are likely to be suitable for all the vertebrate species recorded at the site. The Conservation Area also provides for a number of ecological linkage opportunities.

However, the EPA considers that the proposed Conservation Area in its current state does not provide for adequate protection of the core (highest conservation) values of the Bushplan Site in terms of the condition of the vegetation protected. This, and the shape of the Conservation Area means that more intensive management will be required to improve and maintain its conservation values in the long term.

In order to address the issues of vegetation condition and management of the Conservation Area the EPA has taken a precautionary approach to stage clearing and development through stringent conditions. Conditions have been recommended to set aside an additional 2.6 hectare area, equal to the area of 'Completely Degraded' land within the proposed Conservation Area, to be managed as part of the Conservation Area until such time as the 'Completely Degraded' land has been rehabilitated to 'Good' or better than 'Good' condition.

With regard to odour impacts from the Subiaco Wastewater Treatment Plant, the EPA considers that there is reasonable certainty that at least the proposed Lot 1 will become suitable for residential development after planned improvements to the WWTP have been implemented. Conditions have been recommended to ensure that clearing and/or development does not occur until it is demonstrated that an acceptable amenity for residential use, that is 5 odour units at 99.9 percentile, will be experienced at the site.

The EPA has therefore concluded that it is unlikely that the EPA's objectives would be compromised provided there is satisfactory implementation by the proponent of the

proponent's commitments and the recommended conditions set out in Appendices 3 and 4 and summarised in Section 5.

7. Recommendations

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

1. That the Minister notes that the proposal being assessed is for subdivision of Lots 4 and 105 Underwood Avenue, Shenton Park into three superlots for clearing and development;
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3;
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4, and summarised in Section 5, including the proponent's commitments.
4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

References

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- Environmental Protection Authority (2001b) Residential Subdivision – Pt Lot 4 Underwood Avenue/Selby Street, Shenton Park. Report and recommendations of the Environmental Protection Authority. EPA Bulletin 1034, Perth, Western Australia.
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- How, R.A. & Dell, J. (2000) Ground Vertebrate Fauna of Perth's Vegetation Remnants: Impact of 170 Years of Urbanisation. *Pacific Conservation Biology*, Vol 6: 198-217. Surrey Beatty & Sons, Chipping Norton, New South Wales.

Appendix 1

**Bush Forever Inter-agency Technical Coordination Group Advice to EPA
(5 March 2003)**



Department for Planning and Infrastructure
Government of Western Australia

Environmental Planning Division

Your ref:

Our ref: 805/1/2/32P119

Enquiries: Kieron Beardmore

ATTACHMENT 2

5 March 2003

Bernard Bowen
Chairman
ENVIRONMENT PROTECTION AUTHORITY

Dear Bernard

Re: Superlot Subdivision (No. 120954) for Bush Forever Site 119 (Underwood Avenue Bushland) – Inter-Agency Technical Coordination Group Advice

I refer to the above superlot subdivision application (No 120954), which was referred to the EPA by the proponent. I understand that the EPA will be considering a level of assessment shortly.

Please find attached a report and related attachments presented in accordance with a request from the EPA for advice from the Bush Forever Inter-agency Technical Coordination Group (the Coordination Group) to assist the EPA in setting a level of assessment. In this process, a large amount of common ground has been achieved but there remains marginal disagreement between the key agencies.

In summary, in the context of a Mediated Agreement, the revised superlot subdivision proposal (Option C - which currently identifies a 12 ha conservation area and around 9.76 ha of bushland in Good or better condition, with a commitment to rehabilitate Degraded areas to Good or better condition) submitted by UWA in response to Bush Forever and EPA requirements for Option A (the EPA's previously assessed proposal), can be generally supported by the Bush Forever Office at DPI on wider planning grounds, subject the attached recommendations. However, from a consideration of conservation values alone, the EPA Services (Terrestrial Section) recommend that 12 ha of bushland in Good or better condition should be protected.

Thank you for your request for advice on the proposed negotiated outcome for this site in accordance with the objectives of Bush Forever.

I trust the above information will assist in your determination of the proposal.

Yours faithfully

Paul Frewer
Executive Director
Integrated Policy and Planning

ATTACHMENT A:

Bush Forever Interagency Technical Coordination Group (the Coordination Group) Advice on the Proposed University of Western Australia Superlot Subdivision for Bush Forever Site 119 (Underwood Avenue Bushland).

Background

- As you are aware, the subject site is currently zoned Urban in the MRS and Development zone in the local TPS, and was included within the draft Perth's Bushplan (November 1998) on the basis that it would be a Urban negotiated planning solution. The objective of Urban negotiated outcomes is to seek a reasonable outcome and a balance between conservation and development. This recognises wider social and economic considerations, particularly lands with existing commitments and approvals.
- In considering the current proposal, the Coordination Group was mindful of the above and the EPA's section 16 advice to the Minister for the Environment, which states that the EPA is unlikely to assess a proposal in a Bush Forever site if a reasonable outcome is achieved and will have regard to the advice of government officers.
- By way of background, approximately 31.5 ha of vegetation on the subject site (which includes 26 ha of bushland i.e. vegetation in Good or better condition; and 5.5 ha of Degraded or Completely Degraded bushland) was identified in the draft Perth's Bushplan (the total site was 32 ha). The final Bush Forever identified an agreed negotiated outcome of 8.5 ha, which was endorsed by the then Minister for Planning, Cabinet and the WAPC.
- The subsequent subdivision application (which generally reflected the area identified in Bush Forever) was referred and assessed by the EPA. As a result of this assessment process, the conservation area was reconfigured to consolidate protection of bushland along Selby Street, an area of highest conservation value with regard to the best (Very Good condition) bushland – see Option A (plan attachment), while the size of the conservation area remained at 8.5ha (with a bushland area of 8.2 ha).
- The EPA's assessment of Option A also indicated that the 8.5ha proposed to be protected was inadequate and that a larger area, but not substantially so, should be set aside for conservation. In its assessment, the EPA indicated that the negotiated planning solution (NPS) equated to 26.5% of the total 32 ha identified in the draft Perth's Bushplan (these figures should be reviewed in the context of the latest vegetation condition mapping). It is therefore, arguably, below the area that would be reasonably expected to be retained through the Urban NPS process. The EPA also noted, that the proposed conservation area does not protect populations of the Priority 3 flora species *Jacksonia sericea* and a small population of *Eucalyptus decipiens* (which lie on the draft Bushplan's sites western boundary). It should be noted that in addition to the 8.5 ha conservation area, 1.8 ha of public open space was to be set aside along the service easement, retaining some of the mature Tuart and Jarrah trees.
- The Coordination Group understands that the Hon Minister for the Environment directed the EPA to more fully consider the area of native vegetation that should be conserved on the site. The EPA had reached a position on this issue, but the details of this position were not made public as assessment of the proposal was suspended on the proponent's request.

- The WAPC refused the previous subdivision (WAPC Ref: 112907 - which reflected Option A) and there was an appeal against its decision to the Town Planning Appeals Tribunal. Following further consideration of the EPA's requirements and the odour buffer issue by the proponent, a Mediated Agreement (signed by the EPA, UWA, the Water Corporation and the WAPC) on the planning appeal was established. This Agreement identified a 12 ha conservation area as a basis for more detailed planning and negotiation. The proponent has now submitted a revised superlot subdivision plan (WAPC Ref: 120954) which focuses the 12 ha conservation area in the western sector of the site (Option B) to better account for the buffering requirements of the Wastewater Treatment Plant and to focus initial development phases outside the so called "Wallis Line", where odour is not considered to be a constraint on residential development.
- The Coordination Group has now reviewed the superlot subdivision proposal (Option B) and was mindful of the EPA's requirements for Option A, as outlined in its Bulletin (No. 1034, November 2001) and further considerations by the EPA, and wider planning and structure planning issues.
- In making its comparisons, the Coordination Group recognised that the current superlot subdivision (Option B) addresses future development of the whole UWA land holdings in the area and the whole draft Bushplan, whereas the previous proposal (Option A) applied only to the eastern half of the property and did not include all of the regionally significant bushland identified in draft Bushplan. This has the implication that the EPA now needs to consider the environmental issues over the whole draft Bushplan site as the superlot subdivision carries an expectation that the remaining areas may be cleared and developed as and when required.

Process

- Members of the Coordination Group met on five occasions with representatives from the UWA to discuss their proposal and to review options. This review considered conservation values as well as wider planning and structure planning issues.
- Representatives from the DPI and EPA Services Unit were present at all meetings; a CALM officer was invited but has had a more limited involvement. As a rule, CALM only become involved with negotiations when there are TECs, DRF or future CALM management issues. The WRC has not had a primary interest in the site as it is not associated with any wetlands and have not been involved.
- A site visit was undertaken on two separate occasions (including plot based work) and the vegetation mapping and condition ratings were reviewed and agreed in consultation with ATA Environmental (the UWAs environmental consultants). These findings are reflected in the attached plans and tables. However, it is now understood that ATA Environmental have now released a condition map which is marginally at variance with the agreed position.
- A number of broad options beyond Options A and B (described above) were considered at the meetings, with the general intent of increasing the area of Good and better condition bushland within the proposed conservation area.
- One option generally extended the conservation area of Option B into more consolidated blocks, while retaining the Wallis line at its eastern extent. Other options extended the conservation area beyond the Wallis line toward Selby Street. There were some conservation advantages in extending the conservation area toward Selby Street (ie. including more vegetation in Very Good condition in the conservation area), but generally the option presented by UWA to address this principle was too narrow to

achieve a consolidated area and would result in a larger edge to area ratio. In addition, development outside the "Wallis" line is the favoured planning response with as much as conservation area as possible within the buffer. The structure plan design charrette also proposed staged development, starting outside the "Wallis" line; and land development immediately adjoining the site to the south, along Selby Street (the benefits of which are discussed below).

- With the above in mind, discussions and options then focused on variations of Option B, with the Coordination Group seeking to maximise the amount of bushland in Good or Better condition and UWA representatives seeking to work within the parameters of a 12 hectare conservation area identified in the Mediated Agreement.
- The UWA have now submitted their final position (Option C) which goes some way in meeting some of the Coordination Group concerns but is still set within the limits of the Mediated Agreement. The revised proposal also includes 0.7ha of public open space nestled within, but not forming part of, the 12 ha conservation area to protect the ridge (which includes Degraded bushland) and some tall Jarrahs and is designed to accommodate wider public use and enjoyment.
- For ease of comparison, the following assessment has focused on comparing Option A (previous proposal assessed by the EPA); with the UWA's revised proposal (Option C, which now supercedes Option B), while also being mindful of the EPA's position as identified in its Bulletin (No. 1034) and the EPA's further requirements for Option A, and wider planning and structure planning processes.
- Other attachments include:

Attachment B – Comparison of Natural Values of Options A and C.

Table 1 - The draft Bushplan site, Options A, B and C intersected with the revised vegetation condition mapping.

Attachment C – Plans identifying the draft Bushplan boundary, Options A, B and C overlaid with aerial photography and the revised vegetation condition mapping.

Comments

Comparison of Natural Values

(Please Note: as previously indicated, the current Superlot Subdivision proposal covers all of the UWA land holdings in this area. In formulating its advice the Coordinating Group was mindful that some of the biodiversity conservation values within the Superlot Subdivision area are outside areas identified as regionally significant bushland in the draft Bushplan and Bush Forever. Comments on these areas are made in the context of Bushplan/ Bush Forever recognition of the importance of retaining and strengthening ecological linkages, establishing Greenways and recognising locally significant bushland).

Representation of Ecological Communities

- Both Options A and C meet the representative criteria in Bush Forever, but Option A provides a significantly better representation in terms of bushland condition (i.e. substantially more bushland in Very Good condition – 6.3 ha) and provides for one large consolidated conservation area.

- In addition, while Option C protects more bushland in Good or better condition (from 8.2ha in Option A to 9.4 ha in Option C), the bushland is of a lesser quality (i.e. bushland in Very Good condition for Option C is 1.35 ha) and it effectively splits the bushland into two discrete areas, which reduces the value of the proposed conservation area.
- However, the UWA have committed to restoring the Degraded bushland to Good or better condition (though there is some confusion in the text of their proposal), with the objective of having 12 ha of bushland in Good or better condition. This intention is supported, but the scope to restore Degraded areas is questionable or, at least, not proven elsewhere to date. The restoration of Good areas to better is likely to be more achievable.
- The amount of bushland in Good or better condition to be protected in Option C compared to the bushland in Good or better condition within the draft Bushplan site is around 36% (9.77 ha of 26 ha). However, there are small pockets of Good to Degraded and Degraded to Good condition, which amount to 0.36 ha and, given their location, there may be greater opportunities for restoration to Good or better condition, which would increase the bushland component in Good or better condition from 9.4 ha to 9.76 ha or 37.5% of the bushland in Good or better within the draft Bushplan site. The normal benchmark for an Urban NPS is around 30%. If the proposed 12 ha conservation area was fully restored, this would amount to 46% (or 38% of the total 31.5 ha of vegetation) of bushland in the draft Bushplan site in Good or better condition.
- In summary, Option C increases the bushland area (to either 9.4 ha or 9.76 ha depending on how the small pockets of Good to Degraded and Degraded to Good bushland is viewed) as compared to 8.2 ha in Option A; and, arguable, may meet the EPA requirements for more bushland, albeit of a lesser quality.

Other Criteria

- In terms of other selection criteria in Bush Forever, neither option meets the rarity, diversity or ecological processes criteria. However, Option C does retain greater structural diversity and protects larger mapped populations of the Priority 3 species (which also occurs within Option A, but are not mapped); and a small areas of *Eucalyptus decipiens*. These species were highlighted in the EPA Bulletin as important considerations.
- In terms of ecological processes, Option A has a consolidated shape and a substantially better edge to area ratio, which offers better potential for maintaining vegetation condition with less management intervention. Option C presents better opportunities for the retention of ecological linkages to the west, but makes little commitment to do so, identifying retained linkages in indicative plans as, primarily, social linkage.
- Other criteria which may be taken into account when evaluating areas of equal value, but which when taken alone do not establish regional significance, include: regional recreation value, aboriginal heritage, social and aesthetic values. The protection of all of the ridge crest satisfies the wishes of Aboriginal elders and Option C provides a better outcome. Option C also provides better opportunities for social linkages and public use of the ridge area (discussed below).

Planning Criteria (including a consideration of some wider social and economic issues)

The following broad comparisons can be made:

- Option C reconfigures the conservation areas within the odour buffer and focuses development outside the current extent of the buffer ("Wallis" Line). Option A has significant conservation components outside the "Wallis" buffer and therefore focuses development within the odour buffer.
- Option C provides greater opportunities for three social and ecological linkages off-site along e.g. Underwood Avenue to Bold Park, through to Shenton Park and north of Randel Street. (though the functionality of the ecological link may be questionable depending on their design within the subdivision).
- Both options protect the ridge area within the POS (with an emphasis on public use and enjoyment and grassed areas in a bushland setting). The ridge has significant landscape amenity. Option C retains larger areas of the ridge (some of it within the conservation area), particularly some large Jarrahs, and has a better interface and integration with the conservation area, thereby supporting greater public use; the POS may also act as a buffer. Option A better retains other mature trees off-site through the POS area (see indicative subdivision design) and road/service corridor extending along the ridge to the corner of Underwood and Selby Streets, where it would link with a drainage feature. This approach is supported for Option C. The effective design and conservation compatible management of the POS is more critical in Option A because it represents much of the linkage between the two sections of bushland in the proposed conservation area.
- By allowing development along Selby St, Option C allows for more development closer to Shenton Park station and provides better planning outcomes through the integration with proposed development areas identified through the structure planning charrette abutting the subject site to the south along Selby Avenue. It also provides for more efficient use of existing infrastructure and services through better integration with existing development along Selby Street.
- The structure plan charrette also identified the concept of social linkages as a priority and a need for the ridge to be protected. Option C better meets these structure plan requirements.

Point of Disagreement between Coordination Group Members

- The EPA Service Unit (Terrestrial Section) are of the view that the above comparisons should be between Option A, as recommended by the EPA to be modified i.e. to protect areas outside the original proposal area, and Option C (as finalised with UWA and the Coordination Group).
- The EPA Service Unit (Terrestrial Section) understood that the EPA, in considering Option A, had an expectation that the remaining area identified in draft Bushplan and potential ecological linkages to Bold Park and Shenton Bushland, would be retained in the future stages of development and therefore would argue that Option C offers less bushland and is not as structurally diverse than is expected as part of the EPA's evaluation of Option A. It is also considered that the bushland component of Option C should be of at least equal or better conservation value when compared to Option A (as modified by the EPA) and that in view of the lower condition and the splitting of the bushland area, the bushland component in Good or better condition should be around 12 ha.
- DPI officers are of the view that a strict comparison between Option A (including an interpretation of the EPA's requirements) and Option C is inappropriate in a process

sense. DPI officers believe that the Coordination Group should be mindful of the publicly available EPA advice in Bulletin 1034 and that Option C was viewed as a response to this advice and a recommendation for an increased area of bushland in the context of the Mediated Agreement.

Summary

- Within the limits of the Mediated Agreement and the amount of land UWA is prepared to set aside for conservation, Option C can be given general support from a planning perspective. A higher level of planning support could be secured if a greater commitment to long-term security of the bushland was forthcoming and guaranteed. For example, normally in cases of Urban negotiated planning solutions the proponent is expected to give up the area to be conserved at no cost to Government. This enables the area to be reserved for Parks and Recreation and ultimately vested in a management body, such as the Conservation Commission/CALM, which provides the essential statutory protection that the area will be managed for conservation for the long term. In this case, the UWA had indicated its desire to retain and manage the land itself. In Option A, the University was committed to covenanting the land to provide some form of statutory commitment to manage the area for conservation in the long term. In the current proposal (Option C), the University has withdrawn from this previous position and has indicated that it will not covenant the land. Moreover, it has clearly indicated that it would not support the area being reserved for Parks and Recreation and would not accept that the area could in future be reserved at no cost to Government should the University decide it no longer wanted to manage the area for conservation.
- In the above situation, there is no security in the current proposal that the conservation area would in fact be managed for conservation in the long term. The UWA has committed to a management plan but this provides no long term security. This does not provide a satisfactory basis for implementing a Bush Forever Site. Planning support for the proposal in this form could be given if a commitment to long-term security of the bushland through agreeing to a statutory conservation covenant with a stewardship provision (such as with CALM) was given and guaranteed.
- In addition, the University has not made a firm commitment to retaining potential ecological corridors through its land to the west of the draft Bushplan site despite the opportunity to do so through the current superlot subdivision.
- From a strictly conservation perspective, an additional bushland area beyond that presented in Option C would represent a better conservation outcome. However, again, within the limits of the Mediated Agreement and UWA's position, DPI officers consider that Option C represents a better outcome than Option A in terms of the bushland area to be set aside (with bushland in Good or better condition of 9.76 ha compared to 8.2 ha); but, recognises that the conservation area does not represent an equal or better outcome in terms of bushland condition and consolidation, with less bush in Very Good condition and two discrete bushland areas.
- DPI officers consider that the best outcome that can be achieved within the limitations of the Mediated Agreement, is either 9.76 ha of bushland in Good or better condition (by accepting the small pockets of lesser quality bushland, as described above), or by seeking a slight reconfiguration to increase the bushland area (within the 12 ha limit), which may involve removing a degraded area within the south west corner of the conservation area and increasing the Good or better bushland along its north eastern boundary. This was suggested to UWA representatives but they considered that this meant giving up land with greater development potential in the longer term (though in view of the odour issues, this is debatable). Notwithstanding this, if it is possible to

improve the condition of all the bushland within the conservation area to Very Good (including the Degraded areas), the resulting 12 ha conservation area would be substantially larger than the current 8.2 ha of bushland identified in Option A; and Option C would also have other conservation benefits, in that it incorporates greater structural diversity and linkage opportunities, however, its edge to area ratio would be increased when compared to Option A.

- The EPA Service Unit (Terrestrial Section) consider that the current option does not yet provide the basis for a reasonable conservation outcome as compared to the outcome they understand to be expected by the EPA in reviewing Option A, and are seeking 12 ha of bushland in Good or Very Good condition to be protected. The reasons for this are: the area of bushland in Good condition or better condition is reduced (when compared to the EPA's modified requirements for Option A); the areas of bushland in the proposed conservation area are separated into two areas separated by an area of completely Degraded vegetation; and the boundary of the proposed conservation area is changed from a compact shape best able to maintain vegetation and habitat condition to an attenuated shape with an extensive boundary to area ratio that would be more vulnerable to disturbance from surrounding land uses.
- It is acknowledged by both parties that because of the characteristics of the site and the objective of securing bush within the buffer, the ability to secure either 10 ha of Very Good quality bushland or 12ha of bushland in Good or better condition is limited, and would necessitate a modified boundary that would require addition of areas somewhat more distant from the areas where odour is most constraining, or require a larger area than the UWA are prepared to set aside for conservation (possible up to 14ha). Other options to facilitate the retention of larger area of bushland are therefore identified.

Recommendations

- Unfortunately, the current proposal does not have the full support of the Coordination Group, but the differences of opinion are relatively marginal (with reference to Detailed Recommendation 1. below).
- In order to provide a better planning and conservation outcome and to provide long term security, the following detailed recommendations are made (key differences of opinion are indicated) and should be incorporated into any approvals, as appropriate:

Detailed Recommendations

1. Within the context of the Mediated Agreement and the EPA requirements for an increased area of bushland ("but not substantially so"); and the protection of *Jacksonia sericea* and a small population of *Eucalyptus decipiens*, DPI Bush Forever officers generally support the revised Option C (amounting to approximately 9.76 ha of bushland in Good or better condition, by accepting the small pockets in lesser condition).

Notwithstanding this, DPI officers also acknowledge that a larger area may provide a better conservation outcome and this would require UWA agreeing to:

- A boundary reconfiguration to accommodate more bushland in Good or better condition (though it is acknowledged that this would result in a loss of potential developable areas); and/or
- The staging of development so that additional area of bushland (no more than 2 ha) in Good or better condition is set aside within the subject site and adjoining the proposed conservation area. This would be made available for future

development (subject to odour issues) once the rehabilitation of the Degraded bushland within the conservation areas reaches Very Good condition; and/or

- Securing an additional area of bushland beyond the subject site; and/or
- An increase in the total conservation area beyond the 12 ha limit (to achieve approximately 12 ha of bushland in Good or better condition), and/or to pay for bushland management of the conservation area, through a bushland levy on the residential lots.

EPA Service Unit (Terrestrial Section) do not support the proposal and recommend that 12 ha of bushland in Good or better condition should be protected through:

- The boundary of the conservation area being reconfigured to protect at least 11 ha of bushland in Good or better condition (allowing for small enclaves of lesser condition bushland), within the limits of the 12 ha (approximately) proposed by the UWA; and allowing largely for an area of POS at the top of the ridge to provide most of the connection between the conservation areas. This approach would require part of the POS to be regenerated to Very Good condition to allow for connectivity; and
 - An additional 1 ha be set aside and made available for future development (subject to odour issues) once the rehabilitation of the Degraded bushland to Very Good is complete; or
 - As per DPI officer position above, the UWA agree to secure other areas or investigate a levy.
2. That a commitment be made to seek to restore the Degraded bushland and Good bushland to Very Good condition.
 3. A detailed Environmental Management Plan for the conservation area be prepared in consultation with the DEP, CALM, DPI, the local community and Council. The management plan is to be approved prior to any site works being undertaken and the conservation area is to be managed in accordance with the approved Management Plan (including commitments to 2. above); and should include public access/walkways, in appropriate locations, which should be managed with care. The ATA Environmental report (2000) indicated that the Schedule 1 species Short Billed Black Cockatoo, Calyptrorhynchus latirostris is likely to occur within the area. This species is listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* and therefore the management plan should ensure specific management measures for this species are provided.
 4. A conservation covenant in perpetuity to be placed on the title of the conservation area with CALM.
 5. A commitment is given to protect social linkages and provide improved ecological linkage functions and integration with the conservation area along Underwood Ave, north of Randel Street and east of the Wastewater Treatment Plant; and their design be approved by the Local Council, DPI, DEP and CALM prior to any site works through an overall Landscape Management Plan (LMP - see below) for the subdivision.
 6. Support initiation of a Metropolitan Region Scheme Amendment to reserve the land for Parks and Recreation following subdivision approval and a legal agreement that there be no claim for compensation once the land is reserved.
 7. No clearing of regionally significant vegetation or drainage into the conservation area, including firebreaks, though future passive recreation and provision of walk

trails, seating and focal points is supported through the management plan. Due to the small size of the conservation area, no intrusive research activities are to be carried out within the conservation area.

8. A detailed fire suppression and management plan is to be developed at the detailed subdivision stage.
9. Retention of as many large mature Tuarts and Jarrah, their younger offspring, and suitable bushland areas, as possible and to be identified in liaison with DEP, CALM, Local Council and DPI, in POS and other parts of the subdivision as part of a LMP; substantial trees could be protected through the conservation covenant, where agreed. In respect of the large mature trees, the covenant may be extended to any proposed landscape buffer along Underwood Avenue and Selby St.
10. The preparation of a Landscape Management Plan for the site and the POS areas to the satisfaction of Local Council, DEP, CALM and DPI prior to the any site works being undertaken. The plan should consider integration and linkage opportunities with the conservation areas and other areas off-site (see 5.) and seek to retain the bushland theme by protecting large mature trees and bushland areas, where possible, including rehabilitation within the POS (while recognising the emphasis of the POS is for public use enjoyment, which includes formalized grassed areas).
11. The subdivision design to locate roads boundaries around the conservation area to buffer the reserve from houses and assist in minimising impacts; and the proposed POS to facilitate wider community access and use.
12. Bush Forever Site 119 is also to be shown on any approved plan as "Conservation Area".

General Recommendation

- In the context of the Mediated Agreement and subject to the above conditions, DPI Bush Forever officers can offer general support for the revised proposal (Option C) based on wider planning grounds consistent with the negotiated planning solution process.
- The EPA Unit (Terrestrial Section) is of the view that 12 ha of Good or better bushland should be protected.
- Based on a more limited input to the process outlined above, CALM considers that there is very little real difference between both options in terms of long term viability and both options are deciding between the "least worst", when compared to the draft Bushplan. However, in terms of ongoing management and in the timescale of decades, the viability of both is similar and both will require high ongoing management intervention, but with Option C likely to require a slightly higher level of intervention.
- It is recognised that other planning and environmental considerations, particularly odour, need to be taken into account prior to a final environmental and planning determination on the proposal.

Attachment B – Comparison of Natural Values of Options A and C

The Site as delineated in Perth's Bushplan contains regionally significant vegetation of the Karrakatta Central and South vegetation complex (Hedde *et al.* 1980). The Bushplan Site was identified for a negotiated planning solution. The table below compares two negotiated planning solutions (see Map1) using the criteria for identifying bushland of regional significance as utilised in *Bush Forever* (2000).

The EPA Bulletin (No. 1034, November 2001) advised that Option A was inadequate to protect key conservation values. There was also some assumption that in addition to a 'not substantially so' increase in area proposed to be protected under Option A, an area of bushland to the west of the proposal and linkage vegetation between the conservation area to both Shenton Park Bushland and Bold Park should be protected. The following comparison of Option A to Option C does not include these additional areas as part of the values of Option A. However, it is acknowledged that the benefit these additional areas would provide if secured plus the associated POS would correspond to most of the advantages of Option C suggested in the table. These would include:

- Greater vegetation diversity by including a further three vegetation units:
 1. *Banksia menziesii* and *B. attenuata* Low Woodland over *Allocasuarina fraseriana* and *Hakea prostrata* (ATA Environmental 2000), approx. equivalent to *Banksia attenuata*, *B. menziesii* and *Eucalyptus marginata* Low Woodland (und02);
 2. Scattered *Eucalyptus decipiens* trees (ATA Environmental 2000), approx. equivalent to *Eucalyptus decipiens* Tree Mallee (und04); and
 3. *Jacksonia furecellata* and *Hakea prostrata* Tall Open Scrub (und05), not defined by ATA Environmental (2000).
- Diversity of fauna habitat.
- Diversity of landform and visual amenity by protecting the crest of the ridge.
- Diversity of flora taxa.
- Greater population of the Priority 3 taxa *Jacksonia sericea* and locally significant taxa *Eucalyptus decipiens* and *Banksia prionotes*.
- Opportunity for linkage to Bold Park.

Note: Non BP area is equivalent to the non-bushland area in the SW corner of lot.

Criteria	Option A	Option C
1. Representation of Ecological Communities		
Vegetation Complex	BP Area Karrakatta Complex Central and South A.	BP Area Karrakatta Complex Central and South A. Non BP Area Not representative of a vegetation complex.

	<p>^A While approximately 18% of Karrakatta – Central and South vegetation complex remains in the Perth Metropolitan Region of the Swan Coastal Plain, less than 10% of this complex is proposed for protection in designated conservation areas in <i>Bush Forever</i>, and is therefore not considered to be adequately conserved in the Perth Metropolitan Region of the Swan Coastal Plain at this stage. Compared with most other remnants of this vegetation complex, the Underwood Avenue Bushland is comparatively large and diverse.</p>	
Floristic Community Type	<p>BP Area</p> <p>Floristic community type 28, Spearwood <i>Banksia attenuata</i> or <i>B. attenuata</i> — <i>Eucalyptus</i> woodlands from Supergroup 4: Uplands centred on Spearwood and Quindalup Dunes. This is typical and representative of the vegetation complex mapped.</p>	<p>BP Area</p> <p>Floristic community type 28, Spearwood <i>Banksia attenuata</i> or <i>B. attenuata</i> — <i>Eucalyptus</i> woodlands from Supergroup 4: Uplands centred on Spearwood and Quindalup Dunes. This is typical and representative of the vegetation complex mapped.</p> <p>Non BP Area</p> <p>Not representative of a floristic community type.</p>
Vegetation Unit	<p>BP Area</p> <p>Three units:</p> <ol style="list-style-type: none"> 1. <i>Eucalyptus marginata</i> Low Woodland over a <i>Banksia attenuata</i>, <i>B. menziesii</i> and <i>Allocasuarina fraseriana</i> Low Woodland (ATA 2000). Approx. equivalent to <i>Eucalyptus marginata</i> and <i>Banksia menziesii</i> Open Forest (und01). 2. <i>Eucalyptus marginata</i> Open Woodland over <i>Banksia menziesii</i> Low Woodland (ATA 2000, not mapped). 3. <i>Banksia prionotes</i> Closed Scrub with <i>B. menziesii</i> and <i>B. attenuata</i> (ATA 2000, not mapped) <p>While there is generally an overstorey of <i>Eucalyptus marginata</i> there are patches of <i>B. menziesii</i> and <i>B. attenuata</i>, and <i>B. prionotes</i> Low Woodland in the area. These are generally so small to map at the scale in ATA (2000). The 2002 summer fire has killed most tree <i>Banksia prionotes</i>. Areas of vegetation with an overstorey of <i>Eucalyptus marginata</i> are uncommon in the Spearwood Dunes.</p>	<p>BP Area</p> <p>Seven units:</p> <ol style="list-style-type: none"> 1. <i>Banksia menziesii</i> and <i>B. attenuata</i> Low Woodland over <i>Allocasuarina fraseriana</i> and <i>Hakea prostrata</i> (ATA 2000). Approx. equivalent to <i>Banksia attenuata</i>, <i>B. menziesii</i> and <i>Eucalyptus marginata</i> Low Woodland (und02) 2. <i>Eucalyptus marginata</i> and <i>E. gomphocephala</i> Open Woodland over <i>Acacia saligna</i>, <i>A. rostellifera</i> and <i>Hakea prostrata</i> (ATA 2000). 3. <i>Eucalyptus marginata</i> Open Woodland over <i>Banksia menziesii</i> Low Woodland (ATA 2000). <i>Eucalyptus marginata</i>, <i>Banksia attenuata</i> and <i>B. menziesii</i> Low Open Forest (und03). 4. <i>Eucalyptus marginata</i> Low Woodland over a <i>Banksia attenuata</i>, <i>B. menziesii</i> and <i>Allocasuarina fraseriana</i> Low Woodland (ATA 2000). Approx. equivalent to <i>Eucalyptus marginata</i> and <i>Banksia menziesii</i> Open Forest (und01). 5. <i>Banksia prionotes</i> Closed Scrub with <i>B. menziesii</i> and <i>B. attenuata</i> (ATA 2000).

		<p>Approx. equivalent to <i>Banksia prionotes</i> Low Closed Forest (und06).</p> <p>6. Scattered <i>Eucalyptus decipiens</i> trees. Approx. equivalent to <i>Eucalyptus decipiens</i> Tree Mallee (und04).</p> <p>7. <i>Jacksonia furcellata</i> and <i>Hakea prostrata</i> Tall Open Scrub (und05). Not defined in ATA 2000.</p> <p>At the local vegetation scale the bushland contains a diversity of upland woodland units typical and representative of the Spearwood Dune System.</p> <p>Non BP Area</p> <p>Completely degraded parkland.</p>
Vegetation Condition	<p>BP Area</p> <p>The majority of the bushland is in very good condition with patches in good and very good to excellent condition. The condition of the bushland is comparable to, and in many cases better than, other regionally significant areas on the Spearwood Dunes.</p>	<p>BP Area</p> <p>The majority of the bushland is in good condition with areas in very good, degraded and some severe localised disturbance. It appears there has been an historically higher level of disturbance in the western bushland than in the south eastern bushland. The presence of a series of non-indigenous woody species, soil disturbance (mounding and trenching) and patches with reduced species diversity and increased weed cover were indications of this. In addition the effect of any disturbance may be greater in this area as it is exposed to westerly winds. Spot deaths of <i>Banksia</i> trees in the unburnt section of the western area could be related to this and/or shallower soils on the ridge.</p> <p>Non BP Area</p> <p>Completely degraded.</p>
Habitat	<p>BP Area</p> <p>Consolidated <i>Eucalyptus marginata</i> overstorey with dense cover of understorey.</p> <p>Direct linkage to adjacent bushland south to Shenton Bushland and southeast along Selby Street road reserve.</p>	<p>BP Area</p> <p>Unconsolidated and canopy sparse, likely to be greater threat from predation. Does contain a variety of structural units, including mallees, trees and <i>Banksias</i>.</p> <p>Direct linkage to adjacent bushland south to Shenton Bushland, south west along Lennos Street and northwest along Underwood Ave to Bold Park.</p>

		Non BP Area Reduced canopy cover, but does contain some significant habitat trees.
Comment	BP Area Meets BP Representative criteria as representative of the Karrakatta – Central and South vegetation complex on the Spearwood Dunes ^A and Representative of floristic community type 28. This option in better condition overall than Option C.	BP Area Meets BP Representative criteria as representative of the Karrakatta – Central and South vegetation complex on the Spearwood Dunes ^A and Representative of floristic community type 28. Considerable management effort required to restore entire area to equivalent condition as Option A. Non BP Area Not representative of a vegetation complex or floristic community type. Completely degraded and would require maximum restoration effort.
2. Diversity		
Landform	BP Area Eastern facing gentle slope and flat.	BP Area Eastern facing gentle and steep slope, western facing gentle and steep slope and NS ridge. Non BP Area Eastern facing steep slope and NS ridge.
Vegetation Complex	BP Area One vegetation complex	BP Area One vegetation complex Non BP Area Not representative of a vegetation complex.
Floristic Community Type	BP Area One floristic community type	BP Area One floristic community type Non BP Area Not representative of a floristic community type
Vegetation Structural Unit (see Criteria 1)	BP Area Three structural units. At the local vegetation scale the bushland contains a moderate diversity of upland woodland units typical and representative of the Spearwood Dune System.	BP Area Seven structural units. At the local vegetation scale the bushland contains a higher diversity of upland woodland units compared to Option A. However it should be noted that elements of this diversity may be related to the disturbance history.

		<p>Non BP Area Completely degraded parkland.</p> <p>BP Area 83 native and 18 weed species recorded in quadrats und01, 02, 03, 04, 05 and 06 combined quadrats and recorded adjacent to quadrat (78% native):</p> <ul style="list-style-type: none"> • 40 native and 7 weed species recorded in und01 • 34 native and 13 weed species recorded in und02 • 24 native and 5 weed species recorded in und03 • 11 native and 11 weed species recorded in und04 • 21 native and 6 weed species recorded in und05 <p>• 16 native and 5 weed species recorded in und06</p> <p>2 obvious taxa observed in this option that were not observed in Option A (<i>Eucalyptus decipiens</i> and <i>Olearia axillaris</i>)</p> <p>Non BP Area Species poor.</p>
		<p>BP Area 64 native and 7 weed species in quadrat und01 and recorded adjacent to quadrat (90% native).</p> <ul style="list-style-type: none"> • 40 native and 7 weed species recorded in und01
Fauna	No comparison possible	No comparison possible
Habitat	<p>BP Area One principal habitat in the study area consisting of <i>Eucalyptus/Banksia</i> woodlands although there is local variation in composition and structure (ATA 2000).</p>	<p>BP Area One principal habitat in the study area consisting of <i>Eucalyptus/Banksia</i> woodlands although there is local variation in composition and structure (ATA 2000).</p> <p>Non BP Area Reduced canopy cover, but does contain some significant habitat trees.</p>
Comment	Does not meet BP Diversity criteria as such diversity is typical of this complex.	Does not meet BP Diversity criteria as such diversity is typical of this complex. This option demonstrates more structural diversity than Option A (note comment under condition).
3. Rarity		
Vegetation Complex	<p>BP Area Karrakatta Complex Central and South ^</p>	<p>BP Area Karrakatta Complex Central and South ^</p> <p>Non BP Area Not representative of a vegetation complex.</p>

Threatened Ecological Communities	BP Area No threatened ecological communities located.	BP Area No threatened ecological communities located. Non BP Area No threatened ecological communities located.
Flora	BP Area <ul style="list-style-type: none"> <i>Jacksonia sericea</i> (P3) is endemic to the PMR of the SCP, small populations. <i>Banksia prionotes</i> of local significance is scattered across area, its pattern of distribution possibly related to disturbance. At least one small area of <i>Banksia prionotes</i> Low Woodland/Closed Scrub.	BP Area <ul style="list-style-type: none"> <i>Jacksonia sericea</i> (P3) is endemic to the PMR of the SCP, larger population conserved in Option C. <i>Banksia prionotes</i> of local significance is scattered across area, its pattern of distribution possibly related to disturbance noted under condition, but may be a natural feature. There was a small area of <i>B. prionotes</i> Low Closed Forest in this option before the fire in 2002. <i>Eucalyptus decipiens</i> of local significance as uncommon within site, but is not regionally significant because although patchy is widespread on the Swan Coastal Plain (thus not listed in BF as a significant species). Non BP Area No flora of significance No comparison possible
Fauna	No comparison possible.	No comparison possible
Comments	Does not meet BP Rarity criteria as no TEC, DRF, Scheduled fauna or considerable assemblage of significant flora/fauna located.	Does not meet BP Rarity criteria as no TEC, DRF, Scheduled fauna or considerable assemblage of significant flora/fauna located. This option has a larger population of significant flora than the Option A.
4. Maintaining Ecological Processes and Natural Systems		
Regionally significant link	Potential linkage between Kings Park, Shenton Bushland and Bold Park but no assurance that adjacent vegetation that forms linkage will be maintained.	Potential linkage between Kings Park, Shenton Park Bushland and Bold Park but no assurance that adjacent vegetation that forms linkage will be maintained.
Size/Shape/Consolidation	Area of compact shape and very good condition - the largest consolidated area in best condition.	BP Area Two separated smaller areas, one of compact shape in very good to good condition, the other of good to very good condition with severe localised disturbance.

		Non BP Area Completely degraded condition.
Ecological restoration	Minimal restoration effort required.	BP Area Moderate restoration effort required. Non BP Area Large restoration effort required.
Comments	Does not meet BP criteria.	Does not meet BP criteria, but has greater opportunities for linkage to Kings Park, Shenton Park Bushland and Bold Park.
5. Scientific or Evolutionary Importance		
	NA	NA
6. General Criteria for the protection of Wetland, Streamline and Estuarine fringing vegetation and Coastal vegetation		
	NA	NA
7. Social or Planning Criteria		
	NA	NA

Summary

Option A	Option C
<p>Criteria</p> <ul style="list-style-type: none"> Meets BP Representative criteria as representative of the Karrakatta – Central and South vegetation complex on the Spearwood Dunes[^] and Representative of floristic community type 28. Does not meet BP Diversity criteria, as such diversity is typical of this complex. Does not meet BP Rarity criteria. 	<p>Criteria</p> <ul style="list-style-type: none"> Meets BP Representative criteria as representative of the Karrakatta – Central and South vegetation complex on the Spearwood Dunes[^] and Representative of floristic community type 28. Does not meet BP Diversity criteria, as such diversity is typical of this complex. Does not meet BP Rarity criteria.
<p>Comparison – This option:</p> <ul style="list-style-type: none"> is the largest consolidated area in best condition; in better condition overall than Option C being mostly very good; contains the largest area of the vegetation unit with a highest diversity of species and life forms in the best condition; is less structurally diverse than Option C; contains a smaller population of <i>Jacksonia sericea</i> (significant flora) than Option C; and has some potential for direct linkage to adjacent bushland south to Shenton Bushland and southeast along Selby Street road reserve. 	<p>Comparison – This option:</p> <ul style="list-style-type: none"> is unconsolidated, the bushland being divided into two blocks, west and south east with a non – Bushplan area between; is generally in a more degraded condition than Option A: <ul style="list-style-type: none"> west block: variable, good to very good, good, degraded. south east block: half very good, half good to very good. (As a consequence this option will require a considerable management effort to restore to equivalent condition as Option A and then maintain it in this condition); contains an area not representative of a vegetation complex or floristic community type that is completely degraded and would require maximum restoration effort (non – Bushplan area). demonstrates more structural diversity than Option A by including units not found within Option A; has a larger population of <i>Jacksonia sericea</i> (significant flora) than Option A; and has more potential for direct linkage to adjacent bushland south to Shenton Park Bushland, south west along Lemnos Street and northwest along Underwood Ave to Bold Park; greater opportunities for protection of linkages than Option A.

TABLE 1
 UNDERWOOD AVENUE BUSHLAND
 PROPOSED SUBDIVISIONS
 AREA CALCULATIONS (IN HECTARES) OF VEGETATION CONDITIONS (REVISED)

OPTIONS	Bushplan 98	Jun-01	Nov-02	
		A	B	C
VEGETATION CONDITION				
VERY GOOD	7.93	6.3	0.9563	1.35
VERY GOOD TO GOOD	3.07	1.37	1.63	1.79
GOOD TO VERY GOOD	4.43		3.07	3.09
GOOD	10.58	0.5993	2.44	3.17
TOTAL GOOD OR BETTER	26.01	8.2693	8.0963	9.4
GOOD TO DEGRADED	2.48	0.1872	0.2725	0.2641
DEGRADED TO GOOD	0.42	0.0442	0.4038	0.237
CLEARED	0.19		2.99	
COMPLETELY DEGRADED **	3			2.1
TOTAL ALL CONDITIONS	32.1	8.5	11.7	12.00

Appendix 2

Summary of Submissions and Proponent's Response to Submissions

Appendix 3

Proponent's Commitments

COMMITMENTS TO THE ENVIRONMENTAL PROTECTION AUTHORITY OF 20 MARCH 2003
(8 May 2003 - Reformatted)

Commitment	Objective	Action	Timing	Advice
1. Conservation area	Achieve a conservation area of a size and location that protects the Bush Forever core conservation values and reflects the structure plan enquiry by design outcome. <i>See Bulletin 1034.</i> <i>See also Submission document/ Appendices lodged with the EPA on 4 March 2003.</i>	Create through the proponent's amended plan of subdivision the following: 1.1 a conservation area of 12 ha, located as shown on Chappell and Lambert Plan 778-44 that is the amended plan of subdivision ('amended plan');	Immediately upon the issue of the subdivision approval relating to the amended plan.	EPA
2. Public Open Space	Integrate 0.7ha of Public Open Space (POS) into the conservation area as shown on the amended plan.	1.2 an integrated POS of 0.7 ha, as shown on the amended plan.	Immediately upon the issue of the subdivision approval relating to the amended plan.	WAPC
3. Rehabilitation	Rehabilitation of areas in the conservation area, to 'very good' condition.	Rehabilitate the 'good' bush (8.62ha.) to 'very good' bush and the 'degraded' bush (2.07ha) to 'very good' condition.	During development of the whole of the subdivision area shown in the amended plan.	EPA
4. Environmental Management Plan	Manage the conservation area created by this proposal so as to maintain and rehabilitate as appropriate the vegetation condition and protect the core conservation values for the future. <i>See p 19 of the ATA report in the Submission document/ Appendices lodged with the EPA on 4 March 2003</i>	Prepare a management plan with regard to management of the conservation area including: 4.1 a rehabilitation plan and a weed control plan. 4.1 measures to manage public access to the conservation area. 4.1 a fire management plan.	Prior to clearing of Lot 2 (except for firebreaks and clearing connected with development of Lot 1)	EPA
5. Conservation covenant	Provide certainty as to ongoing conservation of the vegetation in the conservation area.	Enter into a conservation covenant, which would be registered against the title.	Prior to clearing of Lot 2 (except for firebreaks and clearing connected with development of Lot 1)	DOLA/WAPC

6. Protection of interlocking jarrahs on Lot 2	Protection of interlocking trees outside the conservation area.	Protect the interlocking jarrahs on Lot 2.	On approval of detailed subdivision of Lot 2.	WAPC
7. Social linkage across Lot 3	To reflect structure plan enquiry by design outcome.	Create a social linkage via pedestrian paths and retention of native vegetation where possible across the northern boundary of Lot 3.	On approval of the detailed subdivision of Lot 3.	WAPC

Assumptions:

- **Proposal will be implemented**
- **Reserve rights of compensation for the proponent**
- **POS of no more than 8%**

Appendix 4

Recommended Environmental Conditions

RECOMMENDED CONDITIONS AND PROCEDURES

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

**SUPERLOT SUBDIVISION
LOT 4 & LOT 105 UNDERWOOD AVENUE, SHENTON PARK
CITY OF NEDLANDS**

Proposal: The proposal is to subdivide Lots 4 and 105 Underwood Avenue, Shenton Park, a total area of 63.5 hectares, into three superlots, as documented in schedule 1 of this statement. The proposed lots 1 and 2 and part of lot 3 support regionally significant vegetation identified in *Perth's Bushplan* and *Bush Forever*. Lot 3 contains a 12 hectare Conservation Area within which remnant vegetation will be protected and managed to improve its conservation values. The land is situated in close proximity to the Subiaco Wastewater Treatment Plant and is currently affected by odour from the Plant. Improvements to the Plant which are currently being implemented are predicted to reduce odour impacts for residential development. The extent of residential development in lot 2 will depend on the final odour impacts of the Plant after improvements have been completed and odour impact is modelled. The proposed lot 3 will be developed to maintain and expand the University of Western Australia's Agriculture Field Station in the short to medium term, with the potential for residential/mixed use development and non residential development in the longer term.

Proponent: The University of Western Australia and the Water Corporation.

Proponent Address: Stirling Highway, NEDLANDS WA 6009

Assessment Number: 1476

Report of the Environmental Protection Authority: Bulletin 1099

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

Procedural conditions

1 Implementation and Changes

- 1-1 The proponent shall implement the proposal as documented in schedule 1 of this statement subject to the conditions of this statement.
- 1-2 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.
- 1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines on advice of the Environmental Protection Authority, is not substantial, the proponent may implement those changes upon receipt of written advice.

2 Proponent Commitments

- 2-1 The proponent shall implement the environmental management commitments documented in schedule 2 of this statement.
- 2-2 The proponent shall implement subsequent environmental management commitments which the proponent makes as part of fulfilment of the conditions in this statement.

3 Proponent Nomination and Contact Details

- 3-1 The proponent for the time being nominated by the Minister for the Environment and Heritage under Section 38(6) or (7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal until such time as the Minister for the Environment and Heritage has exercised the Minister's power under Section 38(7) of the Act to revoke the nomination of that proponent and nominate another person as the proponent for the proposal.
- 3-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent and provide a letter with a copy of this statement endorsed by the proposed replacement proponent that the proposal will be carried out in accordance with this statement. Contact details and appropriate documentation on the capability of the proposed replacement proponent to carry out the proposal shall also be provided.

- 3-3 The nominated proponent shall notify the Department of Environmental Protection of any change of contact name and address within 60 days of such change.

4 Commencement and Time Limit of Approval

- 4-1 The proponent shall provide evidence to the Minister for the Environment and Heritage within five years of the date of this statement that the proposal has been substantially commenced or the approval granted in this statement shall lapse and be void.

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

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

The application shall demonstrate that:

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

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

Environmental conditions

5 Compliance Audit and Performance Review

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

Note: Under Sections 48(1) and 47(2) of the *Environmental Protection Act 1986*, the Chief Executive Officer of the Department of Environmental Protection is empowered to audit the compliance of the proponent with the statement and should directly receive the compliance documentation, including environmental management plans, related to the conditions, procedures and commitments contained in this statement.

Usually, the Department of Environmental Protection prepares an audit table which can be utilised by the proponent, if required, to prepare an audit program to ensure that the proposal is implemented as required. The Chief Executive Officer is responsible for the preparation of written advice to the proponent, which is signed off by either the Minister or, under an endorsed condition clearance process, a delegate within the Environmental Protection Authority or the Department of Environmental Protection that the requirements have been met.

5-2 The proponent shall submit a performance review report every five years following the issuing of the notice under section 45(7) of the *Environmental Protection Act 1986*, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority, which addresses:

1. the major environmental issues associated with the project; the targets for those issues; the methodologies used to achieve these; and the key indicators of environmental performance measured against those targets;
2. the level of progress in the achievement of sound environmental performance, including industry benchmarking, and the use of best available technology where practicable;
3. significant improvements gained in environmental management, including the use of external peer reviews;
4. stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and
5. the proposed environmental targets over the next five years, including improvements in technology and management processes.

6 Odour

6-1 The proponent shall not clear or develop Lots 1, 2 or 3, except in those areas where it has been demonstrated by the proponent that 5 odour units at 99.9 percentile has been achieved, and other than for the proposed expansion of the Agricultural Field Station, to the requirements of the Minister for the Environment and Heritage, on advice of the Environmental Protection Authority.

7 Regionally Significant Vegetation

- 7-1 Prior to clearing or development of Lot 2, whichever is the sooner, the proponent shall rehabilitate those parts of the Conservation Area depicted in Figure 2 which are currently in 'good' and 'good to very good' condition to 'very good' condition, based on the current vegetation condition as mapped in Figure 3, to the requirements of the Minister for the Environment and Heritage, on advice of the Environmental Protection Authority.

The Minister for the Environment and Heritage may, on the advice of the EPA, permit the following exemptions to this condition, where they are considered necessary for the development of Lot 1:

1. Constructing roads which connect roads on Lot 1, Lot 2 and offsite public road, the conservation areas or public open space;
2. Public open space;
3. Infrastructure or servicing works in connection with Lot 1; and
4. Firebreaks.

- 7-2 Prior to clearing or development of Lots 1 or 2 depicted on Figure 2, the proponent shall identify an area of at least 2.6 hectares within either or both Lots 1 and 2 that is in 'good' or better than 'good' condition and is located adjacent to the Conservation Area depicted on Figure 2, to the requirements of the Minister for the Environment and Heritage, on advice of the Environmental Protection Authority.

- 7-3 The proponent shall not clear or develop the 2.6 hectare area identified pursuant to condition 7-2, and shall manage that area in the same manner as the Conservation Area depicted on Figure 2, until such time as those parts of the Conservation Area which are mapped on Figure 3 as being 'completely degraded', 'good to degraded' and 'degraded to good' condition are rehabilitated to 'good' or better than 'good' condition, to the requirements and satisfaction of the Minister for the Environment and Heritage, on advice of the Environmental Protection Authority.

- 7-4 Prior to any clearing or development of Lots 1, 2 or 3 depicted on Figure 2, whichever is the sooner, the proponent shall develop criteria and methodology against which vegetation condition can be assessed. Acceptance of rehabilitated vegetation condition shall be subject to the agreement of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.

The criteria and methodology shall be based on the following:

- Acceptable scientific method using a standard plot based assessment, including an adequate number of representative plots of an equivalent vegetation unit to reasonably gauge the condition of an area of vegetation being rehabilitated; and

- Vegetation condition scale outlined in Bush Forever (Government of Western Australia, 2001).

7-5 Prior to any clearing or development of Lots 1, 2 or 3 depicted on Figure 2, whichever is the sooner, the proponent shall prepare a Conservation Area Management Plan, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

The objective of this Plan is ensure active management of the Conservation Area for the purpose of restoring and then maintaining its conservation values.

This Plan shall address:

- 1 The values and attributes of the Conservation Area, including vegetation units and condition, significant flora and fauna;
- 2 The regional conservation context of the Conservation Area, including a description of ecological linkages;
- 3 The rehabilitation methodology to address conditions 7-1 and 7-2 and to incorporate continued rehabilitation of the vegetation in less than 'good' condition within the Conservation Area with the aim of eventually bringing these areas to 'very good' condition;
- 4 Condition assessment to address condition 7-5;
- 5 Weed and feral animal control and management;
- 6 Assessment and management of conservation compatible land uses;
- 7 Fencing and management of public access;
- 8 Signage and interpretation;
- 9 Fuel management (linked to Fire Suppression and Management Plan);
- 10 Timelines for implementation; and
- 11 Community involvement.

7-6 The proponent shall implement the Conservation Area Management Plan required by condition 7-5 to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

7-7 The proponent shall make the Conservation Area Management Plan required by condition 7-5 publicly available, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

7-8 The proponent shall review the Conservation Area Management Plan required by condition 7-5 at intervals not exceeding 10 years to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

Each review shall address the topics 1 to 11 required by condition 7-5.

7-9 Prior to any clearing or development of Lots 1, 2 or 3 depicted on Figure 2, whichever is the sooner, the proponent shall prepare a Fire Suppression and Management Plan in consultation with the Fire and Emergency Services Authority, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

The objective of this Plan is to protect the biodiversity values of the Conservation Area and surrounding land uses from fire.

This Plan shall address:

- 1 Methods of fire prevention (eg. public education, limiting public access);
- 2 Methods of fire management (e.g. fire breaks, separation and design of adjacent land uses, fuel loading);
- 3 Methods of fire suppression (e.g. action plan, fire hydrants); and
- 4 Community involvement.

7-10 The proponent shall implement the Fire Suppression and Management Plan required by condition 7-9 to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

7-11 The proponent shall make the Fire Suppression and Management Plan required by condition 7-9 publicly available, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

7-12 Prior to any clearing or development of Lots 1, 2 or 3 depicted on Figure 2, whichever is the sooner, the proponent shall prepare a Landscape Management Plan, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

The objective of this Plan is to maintain and enhance ecological linkages and habitat between the Conservation Area and other regionally significant vegetation areas.

This Plan shall include:

- 1 Identification, management and enhancement of linkages west along Underwood Avenue, north of Randell Road and east to Selby Street;
- 2 Use of locally native species in landscaping of Public Open Space, road reserves and other areas; and
- 3 Retention of large mature Tuart (*Eucalyptus gomphocephala*) and Jarrah (*Eucalyptus marginata*), their younger offspring where practicable.

Note: This Plan may be provided in stages.

7-13 The proponent shall implement the Landscape Management Plan required by condition 7-12 to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

7-14 The proponent shall make the Landscape Management Plan required by condition 7-12 publicly available, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

7-15 Prior to any clearing or development of Lots 1, 2 or 3 depicted on Figure 2, whichever is the sooner, the proponent shall establish an appropriate instrument

(e.g. conservation covenant) to ensure that the retained bushland and rehabilitated vegetation in the Conservation Area, is secured and managed for conservation purposes in perpetuity, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

Procedures

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

Notes

- 1 The Minister for the Environment and Heritage will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environmental Protection over the fulfilment of the requirements of the conditions.

Schedule 1

The Proposal (Assessment No. 1476)

The proposal area consists of 64.3 hectares of land in Shenton Park, City of Nedlands, bounded by Underwood Avenue to the north, Brockway Road to the west, Selby Street to the east and the unmade Randell Street and in the south. The proposal area currently contains the UWA's Agricultural Research Station and bushland. Lot 4 is owned by the UWA freehold and Lot 105 (sewer easement) is owned by the Water Corporation freehold.

The superlot subdivision proposal divides the area into three large lots. Lot 1 consists of all land outside of the odour buffer for the Subiaco Wastewater Treatment Plant as recommended by Consulting Environmental Engineers (2001) and endorsed by the Environmental Protection Authority as a reasonable interim guide for land use planning (the 'Wallis' buffer). The buffer represents the predicted 5 odour unit contour after completion of improvements to the Subiaco Wastewater Treatment Plant. Lot 1 is to be cleared of all remnant native vegetation, with the exception of a linkage and other remnant plants identified in the Landscape Management Plan. Lot 1 is intended for predominantly residential development with lot densities ranging from R20 to R40, or lot sizes of between 200 and 500 square metres. The area of Lot 1 is 9 hectares. Lot 1 is proposed as the first stage of development of proposal area after improvements to the WWTP have been completed. No clearing or development will occur on Lot 1 until it is demonstrated that the area is outside of the 5 ODU odour contour.

Lot 2 is to be cleared of all remnant native vegetation for development, with the exception of the interlocking Jarrahs to be retained in local open space and other remnant plants identified as part of the Landscape Management Plan. Lot 2 is situated within the predicted odour buffer for the Subiaco WWTP and so the extent of residential development is dependent on final modelling of 5 odour unit contour on completion of improvements to the WWTP. A 0.7 hectare Future Public Open Space area is located with 3 sides adjacent to the Conservation Area boundary. The area of Lot 2 is 13.9 hectares. No clearing or development will occur on Lot 2 until it is demonstrated that the area is outside of the 5 ODU odour contour. In addition, an area of 2.6 ha within Lots 1 and/or 2 will be identified and not become available for clearing or development until the area in the Conservation Area, which is 'less than good' condition (about 2.6 ha), has been rehabilitated to at least 'good' condition as determined by an approved methodology. This identified area will be in 'good or better than good' condition, be located adjacent to the 12 ha Conservation Area, and be managed as part of the Conservation Area during this period.

Lot 3 includes the 12 hectare proposed Conservation Area with the remainder of the lot to be cleared and developed to maintain and expand the UWA's Agriculture Field Station in the short to medium term, with the potential for residential/mixed use development and non residential development in the longer term. Prior to any clearing, linkages and significant remnant plants will be identified in a Landscape Management Plan. The total area of Lot 3 is 41.392 hectares.

Table 1 – Key Proposal Characteristics

Element	Quantities/Description
Area (hectares)	9.0 (Lot 1) 13.9 (Lot 2 including 0.7 ha POS) 41.4 (Lot 3) 64.3 (Total)
Area of remnant vegetation (hectares)	31.5 (with 26 ha in ‘Good’ or better than ‘Good’ condition)
Area of Conservation Area	12 hectares with an additional 2.6 ha to be set aside until the ‘Completely Degraded’ area has been rehabilitated to ‘Good’ condition
Vegetation being cleared	Dependant on ultimate odour impact after completion of improvements to the Subiaco Waste Water Treatment Plant and preparation of a Landscape Management Plan Up to 19.5 ha
Condition of vegetation within the Conservation Area by area (hectares) based on the vegetation condition scale utilised in <i>Bush Forever</i> (Government of Western Australia 2000)	1.35 ‘Very Good’ 1.79 ‘Very Good to Good’ 3.09 ‘Good to Very Good’ 3.17 ‘Good’ 0.25 ‘Good to Degraded’ 0.24 ‘Degraded to Good’ 2.1 ‘Completely Degraded’
Area of revegetation	2.6 ha (currently Completely Degraded to be rehabilitated to Good condition) 0.5 ha (currently less than Good condition to be rehabilitated to Very Good condition)

Figures (attached)

Figure 1 – Location of proposal

Figure 2 – The proposal

Figure 3 – Current vegetation condition

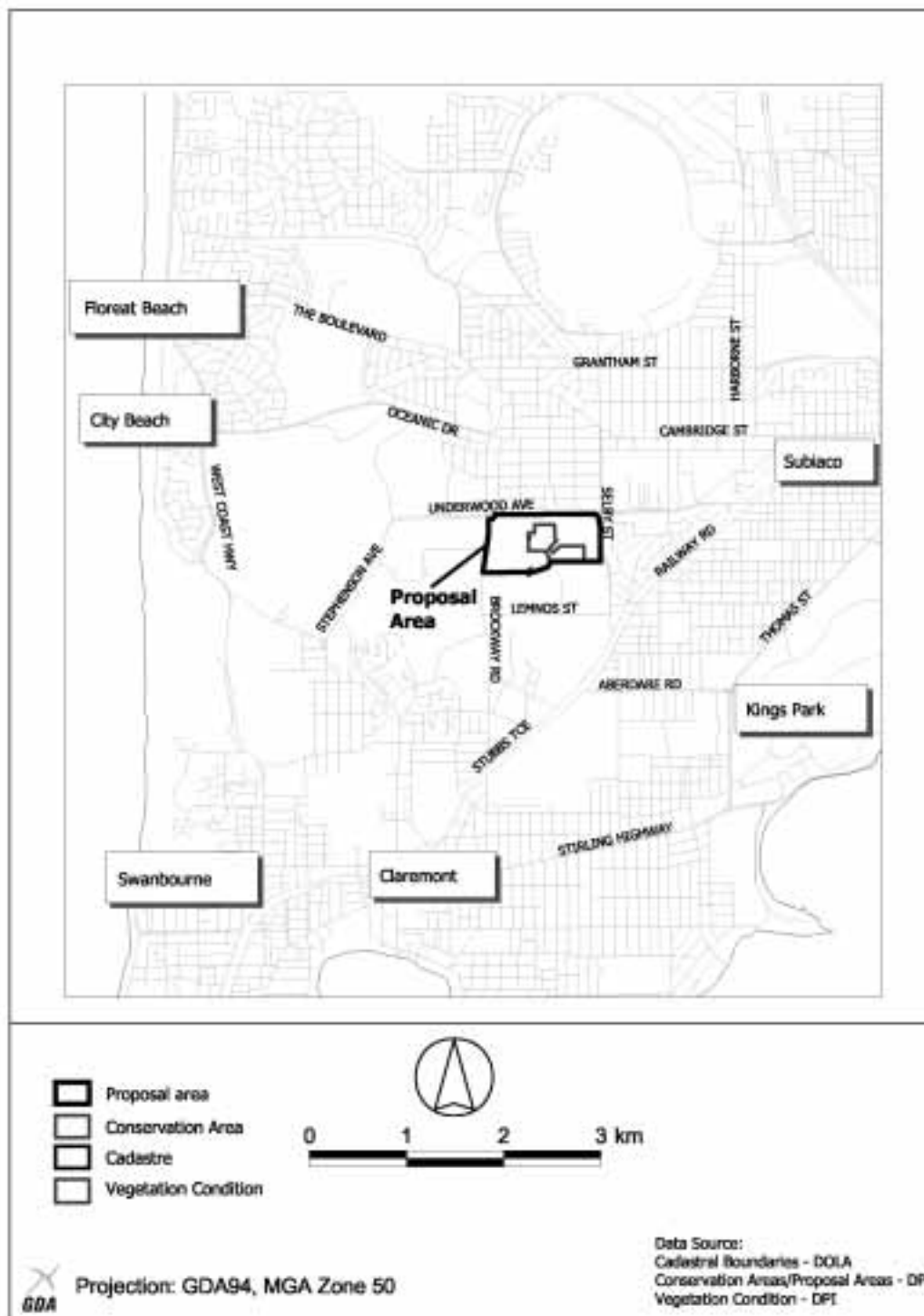


Figure 1: Location of proposal

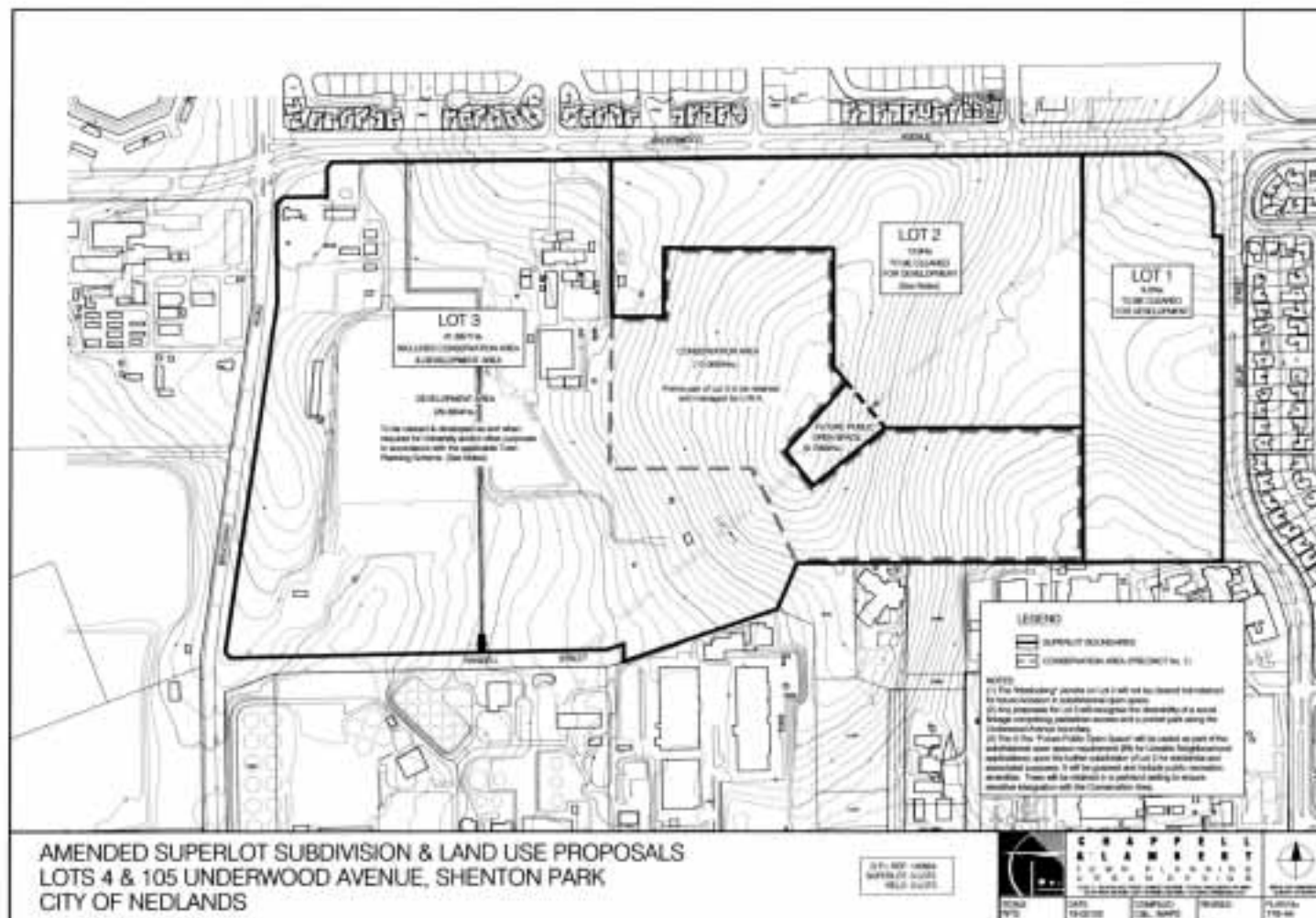


Figure 2: The proposal

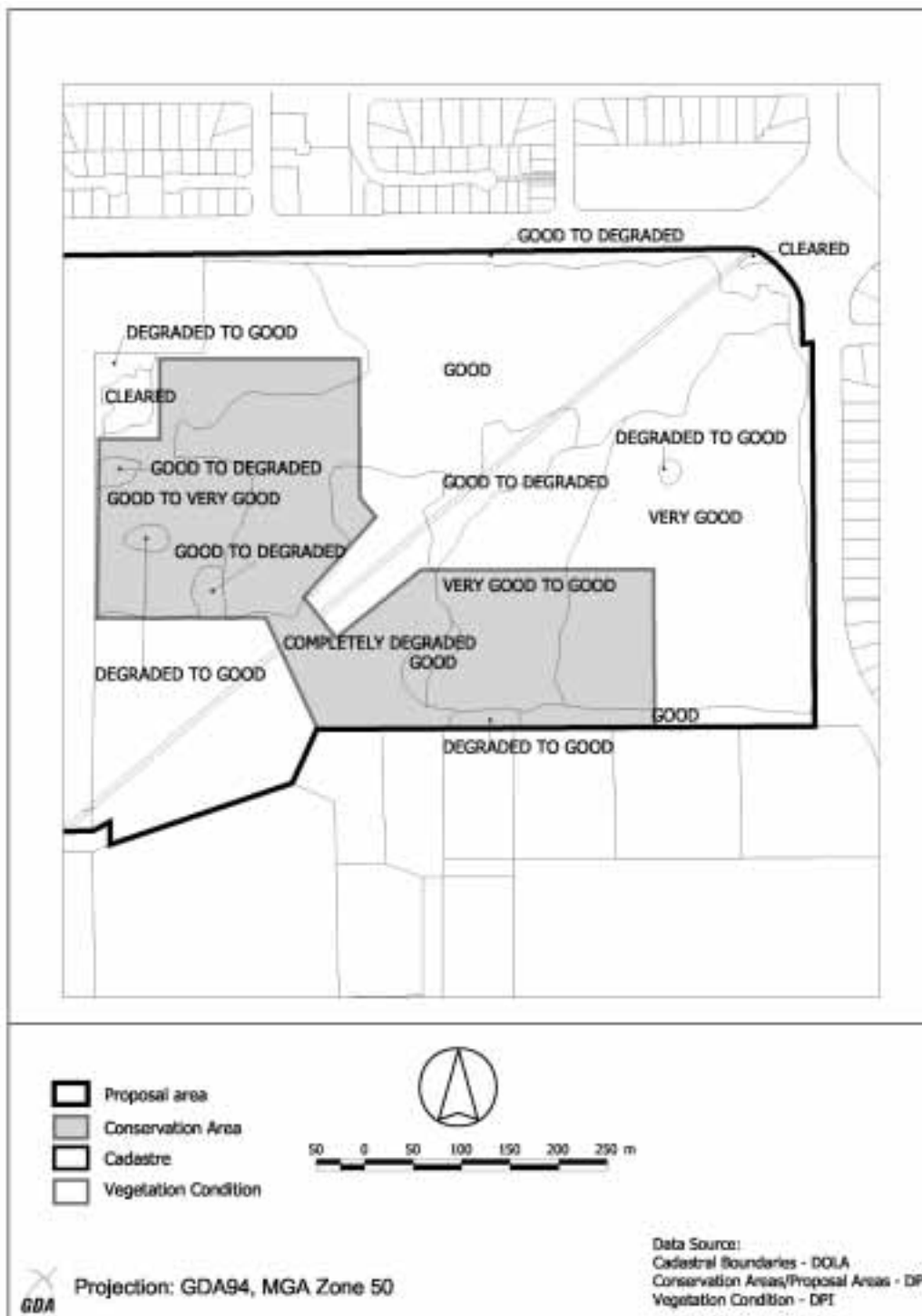


Figure 3: Current vegetation condition