**ANNE CLEMENTS & ASSOCIATES PTY. LIMITED**
**(ABN 41 077 242 365, ACN 077-160-939)**
**Environmental and Botanical Consultants**
**Office 2, 3 Harbourview Crescent, Milsons Point 2060**
**PO Box 1623, North Sydney 2059**
**Phone: (02) 9955 9733, Facsimile: (02) 9957 4343**
**Email:** mail@acabotanic.com

17 December 2012

## APPENDICES

**Response to the flora related issues raised in the Department of Planning and Infrastructure's letter dated 19 April 2011:**
1, 1A and 5 Avon Road, and 4 and 8 Beechworth Road, Pymble

**1.** Letter from NSW Department of Planning and Infrastructure dated19 April 2011 and associated correspondence

**2.** Brief CVs of the authors

**3A.** Photographic record of 27 June 2012

**3B.** Photographic record of 12 November 2012

**3C.** Additional trees surveyed on the Pymble Site by Anne Baumann and Dan Clarke (with Richard and John Higgins) on 22 November 2012, with photographs of previously surveyed trees.

**4.** Ku-ring-gai Council's Tree Preservation Order

**5.** Comparison with the Final Determination for *Blue Gum High Forest in the Sydney Basin Bioregion*

**6.** "NSW National Parks and Wildlife Services (1999)- General Guidelines for Environmental Management Plans"

**7.** The NSW Department of Environment and Climate Change (2008) – Protecting and Restoring Blue Gum High Forest

**8.** Pathways through conservationally significant vegetation in the Sydney region

**9.** Ku-ring-gai Council Weed Management Policy – Revised Edition March 2007

**Appendix 1.**

**Letter from the NSW Department of Planning and Infrastructure dated 19 April 2011**

**Letter from the Department of Environment and Climate Change NSW dated 15 February 2011**

**Submission from Ku-ring-gai Council dated 4 February 2011**

NSW GOVERNMENT | Planning & Infrastructure

James W Neale
25 Fox Valley Road
Wahroonga NSW 2076

Our ref: MP08_0207 & MP10_0219

Dear Mr Neale,

**Subject: Concept Plan (MP08_0207) & Project Application (MP10_0219) - Residential development at Avon, Beechworth and Arilla Roads, Pymble**

I refer to your Environmental Assessment (EA) for the proposed redevelopment of the above site. As you are aware, the Department has exhibited the application and a copy of all submissions received have been forwarded for consideration. In this regard, in accordance with Section 75H of the *Environmental Planning and Assessment Act 1979*, the Director-General requires that a response to the issues raised in these submissions be provided, in addition to addressing any issues raised by the Department of Planning.

The Department has reviewed the submissions received and considered the proposal as detailed in the EA. The Department has identified a number of issues with the proposal relating to height and building layout, environmental constraints, residential amenity, traffic generation and carparking. These issues are outlined in **Schedule 1**.

The Department will also require additional information to complete its assessment as outlined in **Schedule 2**.

It is considered that a Preferred Project Report (PPR) should be prepared identifying how you have addressed issues raised by the submissions and the Department. The PPR must also demonstrate measures to minimise any environmental impacts of the proposal. Revised Statements of Commitment for the Concept Plan Application and the Project Application should also be provided incorporating any amendments following your response to the submissions and should be submitted as separate documents.

The Department is available to meet to discuss the issues raised in the public submissions and this letter. In this regard, please contact Andrew Smith, Team Leader, Metropolitan & Regional Projects South, on (02) 9228 6457 or via email at andrew.smith@planning.nsw.gov.au.

Yours sincerely,

19.4.11

Chris Wilson
**Executive Director**
**Major Project Assessments**

## SCHEDULE 1 – KEY ISSUES

**Land Amalgamation and Site Description**
The Department notes that it is intended to amalgamate new land with the existing site and the Preferred Project Report (PPR) should confirm the **final** configuration and area of land comprising the development site and amend/update all relevant plans and reports accordingly. It should be noted that any land to be included within the PPR site, but not currently in the ownership of the Proponent, will require the submission of an owners consent to the Department.

**Building height, scale and character**
The heights of the Stage 4 and Stage 5 Concept Plan envelopes are considered to be excessive and should be amended to reduce the visual impacts of the overall proposal and to provide a more appropriate relationship and transition with the local urban context. In this regard, the PPR should provide a further analysis of these envelopes including options for reductions in height. That analysis should also include the potential relocation and/or reconfiguration of Envelopes 4 and 5 to maximise tree retention, particularly in respect of Envelope 4, which has been identified by DECCW as having a potential detrimental impact upon the connectivity values of vegetation on site.

Any redistribution of floorspace in respect of the above requirements is unlikely given the existing site constraints and the scale and character of existing development adjacent the site boundaries.

**Building height and amenity impacts**
The height of the 7 storey portion of the Stage 3 Concept Plan envelope is excessive and options for reducing the height, bulk and scale should be considered to reduce the amenity impacts upon the adjacent residential properties.

The setback and height of the Stage 1 Project Application building should be amended taking into consideration the potential impacts of height, bulk and scale upon No. 7 Avon Road. In this regard, particular consideration should be given to the height and expression of the elevated building podium, the minimal landscape setback to the adjacent side boundary and the location of the main driveway.

Any redistribution of floorspace in respect of the above requirements is unlikely given the existing site constraints and the scale and character of existing development adjacent the site boundaries.

**Environmental constraints**
Agency submissions have identified that a range of environmental constraints relating to vegetation corridors, riparian setbacks and bushfire risks affect the site.

The Council, NOW and DECCW have identified the natural drainage line on site as a "river" (as defined) and accordingly, issues relating to the Core Riparian Zone and rehabilitation of the riparian corridor are important considerations.

The PPR should provide a more coordinated analysis of the capacity of the site in a single document, with particular reference to the submissions from Department of Environment Climate Change and Water (DECCW), NSW Office of Water (NOW), Rural Fire Services (RFS) and Ku-ring-gai Council. This further analysis may require a review of the submitted Flora and Fauna Assessment, Vegetation Management Plan (VMP), and Landscape Masterplan, and should map the required bushfire Asset Protection Zone (APZ) and the required CRZ on one diagram together with the location of building footprints and other key infrastructure such as drainage works and pathways. The PPR should also consider options for relocating the Stage 3 and 4 Concept Plan envelopes clear of the Core Riparian Zone (CRZ).

The PPR should also address the inconsistencies between the Flora and Fauna Assessment, VMP, Bushfire Assessment and Landscape Masterplan identified by Agency submissions.

The Council and DECCW have indicated that the EA does not clearly identify the trees to be removed and trees to be retained on site, particularly in respect of Sydney Blue Gums. The PPR should provide an updated and more detailed plan.

**Traffic generation, road capacity and carparking**
Agency submissions have noted the potential of the proposal to impact upon the local road network, particularly in respect to the Pacific Highway and Beechworth Road intersection, and the Pacific Highway and Livingstone Road intersection. Submissions have also identified that the new connecting road across the site between Beechworth Road and Avon Road would assist in alleviating local traffic congestion.

Further assessment is required in relation to the capacity of the local road network and road intersections to accommodate the additional traffic to be generated by the increase in density above the density contemplated by the Ku-ring-gai Town Centres LEP. In this regard, a detailed justification is required for the application of the "high density residential" traffic rate of 0.29 vehicles trips per dwelling from the RTA's Traffic Generating Guidelines. The Council has indicated that the "medium density residential" rate of 0.4 vehicles trips per dwelling is more appropriate to the local urban context.

The further assessment should also detail the potential implications for the local road network of NOT providing the new cross site road.

The amount of carparking proposed for the Concept Plan and Stage 1 Project Application is considered excessive and incompatible with the objectives of Metropolitan Plan 2036. Given the site's high accessibility to public transport, consideration should be given to reducing the number of car parking spaces proposed in line with a minimalist approach and consistent with Council's local controls.

**Contributions, works – in - kind offsets and provision of infrastructure**
Further clarification and consideration of Section 94 Contributions and provision of infrastructure for the site is required. The EA and plans have not clearly identified proposed infrastructure works that are to be provided as a direct result of the proposal either on site or within the public road reserve.

Specifically, the EA notes that a connecting link for pedestrians will be established in lieu of the identified connecting road between Avon and Beechworth Road, however no details have been provided for these works or with respect to the staging of these works.

Section 94 Contributions should be reassessed in accordance with Councils submission and the recently adopted Town Centres Section 94 Plan. Any works proposed to be offset against monetary Section 94 Contributions should be clearly identified and justified.

In addition, Railcorp's submission has identified the need to provide upgrades to the access path between the site and Pymble Station, and upgrades to the pedestrian underpass to Pymble Station, and these matters should be considered in the PPR and the timing and extent of any public benefit works should be identified.

## SCHEDULE 2 – ADDITIONAL INFORMATION REQUIRED/ COMMENTS

In addition to any revised architectural plans and supporting documentation, including analysis of options and designs reflecting the issues raised in **Schedule 1**, the following information is also required:

- The following additional/revised plans and documents are required:
  - Electronic copies of the aaSIDRA analysis for the Pacific Highway intersections are required for detailed assessment as indicated in the RTA's submission.
  - A schedule of calculations for the overall site coverage of the development and the deep soil area. It is noted that the deep soil area is the area of open space on site with no structures below ground level.
  - A report indicating that the buildings in Envelopes 2, 3, 4 and 5 are capable of meeting the solar access and cross ventilation requirements of SEPP 65 and the Residential Flat Design Code (RFDC).
  - A plan indicating that the buildings in Envelopes 2, 3, 4 and 5 are capable of meeting the building separation requirements of SEPP 65 and the RFDC.
  - Confirmation that all access roads comply with Section 4.2.7 of *"Planning for Bush Fire Protection 2006"*.
  - The Bushfire Mapping shall be amended in accordance with Council's submission dated 4 February 2011.
  - The future intended use of the battleaxe access to Arilla Road should be clarified.
  - Separate Revised Statements of Commitments should be provided for the Concept Plan and the Stage 1 Project Application as separate documents to the PPR, and where appropriate, provide a response to the requirements of other agencies and the Department's key issues. DECCW has indicated that no commitment has been made in relation to undertaking a detailed contamination assessment of the site and possible remediation works (if required) prior to the commencement of excavation works on site, and this matter should be given consideration.
  - The Landscape Masterplan should be amended to detail proposed pedestrian linkages across and through the site, particularly in respect of providing access to the communal open space at the south - western corner of the site.
  - Indicative elevation plans of each of the Concept Plan envelopes including existing ground levels.
  - Dimensioned cross-section plans detailing the relationship between the following existing and proposed buildings;
    - No. 15 Avon Road and Envelope 3
    - No. 6 Beechworth Road and Envelope 5
    - No. 10A Beechworth Road and Envelopes 4 & 5
    - No. 7 Avon Road and Envelope 1
  - Plans detailing the indicative extent of cut and fill required across the site and adjacent to site boundaries and details should be provided of the potential impacts on the CRZ.
  - The Concept Plan and Stage 1 plans should clearly identify the communal open space areas and include a schedule of the amount of communal open space available to individual buildings.
  - A Stormwater and Drainage Management Concept Plan should be provided for the proposal as required by the DGR's, and shall include a consideration of the quality of stormwater runoff, management of environmental flows and identify that stormwater devices and infrastructure will be located outside of the CRZ.
  - A plan of the Concept Plan envelopes 1, 2, 3, 4 and 5 showing the height above ground level in storeys at the corner of each of the envelopes.

**Stage 1 Project Application**

- The following additional/revised plans and documentation is required:
  - A site plan locating the Stage 1 development in relation to the whole site shall be provided and should detail all site works proposed to be undertaken with Stage 1.
  - Amended landscape plan identifying existing and proposed levels around the building and soil depths over basement levels and within planter boxes.
  - Appropriate plans and a solar access report shall be provided verifying that the Stage 1 building complies with the solar access and cross ventilation requirements of SEPP 65 and the RFDC.
  - A schedule of unit sizes and balcony sizes (and dimensions) demonstrating compliance with minimum size requirements of SEPP 65 and the RFDC.

**Clarification required**

- Clarify errors and inconsistencies in the submitted documentation including, but not limited to:
  - 355 units are proposed in the EA but Concept architectural plans show 350 units.
  - The number of storeys identified in the EA for buildings are inconsistent with those shown in the Concept architectural plans.
  - The deep soil zones identified in the landscape plans are inconsistent with other plans.

PCU019683

Your reference: MP08_0207 & MP10_0219
Our reference: DOC10/56944
Contact: Richard Bonner, 9995 6833

Mr Michael Woodland
Director, Metropolitan Projects
Department of Planning
GPO Box 39
Sydney NSW 2001



Attention: Simon Truong - Planner

Dear Mr Woodland

**Re: Concept Plan (MP08_0207) & Project Application (MP10_0219) – Exhibition of Environmental Assessment for residential development at Avon, Beechworth and Arilla Roads, Pymble**

I refer to your letter dated 13 December 2010 inviting comments from the Department of Environment, Climate Change and Water (DECCW) in relation to the above Concept Plan and Project Application.

DECCW has reviewed the Environmental Assessment Report (EAR) and associated specialist reports and provides the following comments in relation to the biodiversity, contamination and car parking aspects of the proposals.

**Biodiversity**

DECCW has reviewed the Flora and Fauna (FF) Assessment, the Vegetation Management Plan (VMP) and the Arborist report and understands the site contains a remnant of the critically endangered ecological community, Blue Gum High Forest (BGHF), albeit degraded with a weedy understorey.

DECCW considers the FF Assessment to be inadequate as:

- it states that there are weeds in the understorey, but it is difficult to determine the extent of weed invasion across the site and the native vegetation cover that remains;
- it only discusses impacts from removal of trees, not removal of the critically endangered ecological community;
- potential direct and indirect impacts on BGHF from increased urbanisation have not been considered eg overshadowing, soil compaction, trampling, altered drainage patterns, increased nutrient levels, root damage from provision of basement car parks, etc;

DECCW also considers the VMP to be inadequate as it proposes implementation for only one year. The exotic species on the site are notoriously difficult to eradicate and given the level of infestation, DECCW recommends a VMP should be implemented for at least 5 years.



PO Box 668 Parramatta NSW 2124
Level 7, 79 George Street Parramatta NSW
Tel: (02) 9995 5000 Fax: (02) 9995 6900
ABN 30 841 387 271
www.environment.nsw.gov.au

It is also unclear how many trees will be removed as a result of the development. The FF Assessment states that the development will lead to the removal of 8 Blue Gums, 3 Turpentines and a Blackbutt. However, according to the Arborist report all 12 trees to be removed will be Blue Gums.

Although the site is degraded, it does provide important corridor values for nearby remnants such as Sheldon Forest and others in the headwaters of the Lane Cove River valley. Sheldon Forest is a significant BGHF remnant, as demonstrated by its categorisation as a Type 1 high quality remnant patches in the distribution advice for BGHF under the *Environment Protection and Biodiversity Conservation Act 1999*. The proposed development, particularly building 4, will significantly reduce the connectivity values of vegetation on the site, which may in turn reduce the viability of neighbouring BGHF remnants.

DECCW notes that the development proposes replacement plantings of trees and native understorey species. However, these will not replace lost ecological values in the short to medium term. In addition, it does not appear that the replacement plantings will be able to recreate an ecological community that could be classified as BGHF, given the plantings will be within garden beds, subject to edge effects and provision of asset protection zones.

**Contamination**

Key issue 16 of the Director-General Requirements (DGRs) requires the EA *'to demonstrate compliance that the site is suitable for the proposed use in accordance with SEPP 55'*. Appendix 27, an August 2010 report '*Stage 1 Environmental Site Assessment*', includes a recommendation that an investigation including sampling and analysis be undertaken, ideally after vegetation has been cleared from the site. DECCW recommends that a detailed soil investigation be carried out at the site, with the need for groundwater investigations assessed based on the results of the soil contamination assessment. Depending upon the results of the soil investigations, the development and implementation of a groundwater sampling plan and/or remedial action plan may be necessary. If significant contamination is identified, consideration should be given as to whether a site auditor accredited under the *Contaminated Land Management Act 1997* should be engaged to review the consultant's work and ultimately provide a site audit statement commenting on site use suitability.

The statement of commitments (Appendix 38) does not appear to include a commitment to undertake a detailed contamination assessment of the site and possible remediation works (dependent upon the results of the investigations). DECCW recommends these actions be included as a condition of consent (or an amended statement of commitments). Should investigation and remediation works be required they should be conducted and reported in accordance with relevant guidance, including *Guidelines for Consultants Reporting on Contaminated Sites* (Environment Protection Authority, September 2000).

**Car Parking**

It is noted the development incorporates 477 car parking spaces – 192 more than the minimum required by Ku-ring-gai Council's parking requirements. Given the close proximity of frequent public transport services and the recently released Metropolitan Plan for 2036 objective to reduce greenhouse gas emissions, DECCW recommends DoP consider reducing the motor vehicle dependence of this development and encouraging public transport by reducing the number of car parking spaces.

Yours sincerely

15/2/11

**STEVE HARTLEY**
**A/Director Metropolitan**
**Environment Protection and Regulation**

818 Pacific Highway, Gordon NSW 2072
Locked Bag 1056, Pymble NSW 2073
T 02 9424 0888 F 02 9424 0880
DX 8703 Gordon TTY 02 9424 0875
E kmc@kmc.nsw.gov.au
W www.kmc.nsw.gov.au
ABN 86 408 856 411

Ku·ring·gai Council

PCU019276

**Contact:** T Southwell

**Reference:** S02979 / 4 February 2011

Major Projects Assessments
Department of Planning
GPO Box 39
SYDNEY NSW 2001



Att: Director, Metropolitan Projects

Dear Mr Woodland

**MP08-_-0207 and MP10_0219**
**Residential Flat Development at 1, 1A, 5 Avon Rd, 1 Arilla Rd and 4, 8 Beechworth Rd Pymble**

Thank you for the opportunity to comment on the above major project. Please find attached Ku-ring-gai Council's submission in this regard.

If you have any queries in regard to the submission, please contact Terri Southwell on 9424 0876.

Yours sincerely

Antony Fabbro
Manager, Urban Planning

## Translated Extract

### English

Need help?
This document contains important information and news. If you do not understand it, please call the Telephone Interpreter Service on 131 450 and ask them to phone 9424 0888 on your behalf to contact Ku-ring-gai Council. Business hours: Monday - Friday, 8.30am - 5pm.

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### Chinese (traditional)

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# Ku-ring-gai Council Submission

## Proposed Residential Flat Development
## 1, 1A & 5 Avon Rd, 4 & 8 Beechworth Rd & 1 Arilla Rd, Pymble

MP08_0207 and MP10_0219

February 2011

## Introduction

This submission provides Ku-ring-gai Council's comments on the key issues in relation to the concept plan and project application for residential flat development at the above site. The comments have been reviewed by the Council and adopted at its ordinary meeting of 1 February 2011.

## Relevant EPIs, Guidelines to be addressed

The concept plan proposal was deemed to be one to which part 3A of the EP&A Act applies as it was, at the time, identified in Clause 15 in Schedule 2 (Specified sites) of the Major Development SEPP, entitled 'Housing in Ku-ring-gai' (see Declaration of 1/12/2008). The inclusion of the site in schedule 2 of Major Development SEPP was on the basis that the site was previously identified development for the purpose of multi-unit housing on sites within the Ku-ring-gai area listed in Schedule 4 of State Environmental Planning Policy 53 Metropolitan Residential Development (SEPP 53) as a Major Development to be assessed under Part 3A of the EPA Act.

However, since the time of lodgement of the application under Part 3A a number legislative changes have taken place which Council believes renders the application invalid.

- The making of the Ku-ring-gai Local Environmental Plan (Town Centres) 2010 (Town centres LEP) on 25 May 2010 which repealed SEPP 53 from applying to the land. SEPP 53 was subsequently amended on 25 June 2010 to reflect the provisions of the Town Centres LEP.
- The Major Development SEPP was amended on 25 June 2010 to omit Clause 15 from Schedule 2. This resulted in the site no longer satisfying the requirements of clause 6(1) of the Major Development SEPP to be considered under Part 3A of the Act.

Given that there were no savings and transitional provisions included in the amendments to the Major Development SEPP on 25 June 2010 to save applications that had been lodged under the provisions of the SEPP but not determined, it is Council's view that the application has lapsed and cannot be determined by the Minister as it is no longer a project to which Part 3A applies.

As a result of the above mentioned amendments to the relevant Environmental Planning Instruments (EPIs), the remaining relevant EPIs and guidelines to be addressed by this application are the following:

- Objects of the EP&A Act
- SEPP 55, SEPP 65, SEPP (Infrastructure) 2007, SEPP (BASIX) 2004
- Ku-ring-gai Council's Town Centres LEP and Town Centres DCP
- Draft North Subregional Strategy

It is also emphasised that Town Centres LEP was prepared by the ministerially appointed Ku-ring-gai Planning Panel, with the Minister making the plan in its final form and exempting the site from SEPP No. 53 and the Major Development SEPP. These actions demonstrate that the Minister's clear intent is that the Ku-ring-gai Town Centres LEP is the relevant EPI to apply to this site. Given this, it is Council's position that any application for this site should be lodged with Council for assessment with the Joint Regional Planning Panel (JRPP) as the determining authority.

It is noted that the applicant claims that the proposal was deemed to be one to which Part 3A applies, due to the Capital Investment Value. However, this was not the Director General's determination. Further, the CIV is so high, only because the applicant so far exceeds the development potential of the site under the Ku-ring-gai LEP (Town Centres) 2010 (KLEP), (and indeed the provisions of SEPP 53 when it applied).

**Objects of the Environmental Planning and Assessment Act 1979**

The proposal fails to provide for the orderly and economic development of the land, by isolating a number of sites, sites which are the most suitable parts of the site for the development. It also fails to protect the environment, by isolating an area of critically endangered ecological community.

**Ku-ring-gai Local Environmental Plan (Town Centres) 2010**

Significant planning and consultation were undertaken to ascertain the best locations for increased density and the location and scale of residential flat buildings, as part of the town centre planning. This included a thorough consideration of the appropriate density of the subject site. While SEPP 53 provided for increased density on this site, the Ku-ring-gai Local Environment Plan(Town Centres) 2010 (KLEP), in recognising the constraints of the site, amended the height and increased the FSR controls to allow for a viable development to be designed that would address these constraints. The KLEP was gazetted with these amendments.

Compliance with the key provisions of the KLEP is outlined in Table 1.

It is recognised that the capital investment value of the proposal would allow it to be considered as a major project for the purposes of Part 3a, if this were given as the reason for the determination. However, the only reason the proposal is over the CIV value required for consideration as a major project, is due to the total disregard of the planning controls in the Ku-ring-gai (LEP (Town Centres) 2010 (and for that matter, the previous controls under the Major Project SEPP). The extent of the non-compliance is therefore the only reason the proposal *could* be considered under Part 3a. Approval under these circumstances would set a precedent, that has the potential to undermine the KLEP and the planning for the town centres.

Table 1. Compliance with KLEP – estimates only as insufficient detail provided for accurate assessment

| Clause | Provision | Proposal | Compliance |
|---|---|---|---|
| 2.2, 2.3 | R4 zoning, permitting residential flat building | Residential flat building | Yes |
| 4.3 | Maximum height of 17.5m on Avon Rd, (most of Building 1 area)<br><br>Maximum height 23.5m further to the west | Maximum height:<br>Building 1: 4-7 storeys - 21m where 17.5 permitted<br>21m where 23.5 permitted<br><br>Building 2: 5 – 6 storeys Approx 18m<br>Building 3: 2-9 storeys<br>At least 27m<br>Building 4: 4 – 11 storeys<br>- 37m<br>Building 5: 5-9 storeys Approx 30m | No. Of 5 buildings only 1 complies. The degree of non-compliance is up to almost 60% above the maximum height. |
| 4.4 | Maximum floor space ratio of 0.8:1 | FSR > 1.4:1<br>Note the proponent's calculation of 1.39:1 fails to include the gymnasium and the surplus car parking. | No. The proposal is 75% higher than the permitted FSR. |
| 6.1 | Minimum frontage for medium and high density development | 57m to Avon Rd, 17m to Beechworth. The 17m frontage complies as it is treated as an access handle, for battleaxe development. | Yes, however, some of the sites isolated by the development do not. |
| 6.5 | Protection of biodiversity | Results in significant clearing and other impacts on Blue Gum High Forest. Some areas rehabilitated. | No |
| 6.6 | Protection of riparian zones | Buildings 3 and 4 intrude within the riparian zone, and the required Asset Protection Zones intrude further. | No |

**Inadequacy of plans and information provided**

Council has serious concerns about the inadequacy of the plans and information provided in the Environmental Assessment. The level of detail, consistency and accuracy is so poor, that approval of the proposal may leave the consent authority liable for damage or repairs, or expensive alterations that may be required during or after construction, that should have been anticipated, and designed for, at the proposal stage. At a minimum, the construction of the development in accordance with such inadequate and conflicting plans and reports would result in an extremely poor quality development, with ongoing and unnecessary maintenance issues for future residents of the site and the locality, and unacceptable environmental impacts.

The following are inadequate:

*Flora & Fauna Assessment Report*

- The report fails to assess the impacts of the proposal upon the Critically Endangered Ecological Community (CEEC) Blue Gum High Forest (BGHF).

- The assessment fails to demonstrate and provide sufficient information to make an accurate assessment of the "Activity" and associated impacts upon the BGHF community.
- The assessment detailed within Attachment A fails to consider the "direct" and "indirect" impacts to the BGHF community as a result of the proposal.
- The assessment only considers the removal of 12 trees not the removal of the BGHF community.
- The report fails to consider the impacts upon Tree 100, a large blue gum (*Eucalyptus saligna*)
- While identifying most trees on the site (other than some weed species) the report fails to identify all the trees on the site;
- The assessment fails to demonstrate the "extent" of the community within the site & the physical area to be removed and/or to the compositional components of the habitat and the degree to which is affected, this in particular reference to the local occurrence of BGHF community within the site.

*Vegetation Management Plan*

- The VMP fails to consider the Department of Environment and Climate Change best practice guidelines for Blue Gum High Forest:
    - Revegetation is proposed, while regeneration is required under the guidelines;
    - Mulching is proposed contrary to the best practice guidelines for BGHF;
    - The maintenance period specified is inadequate;
    - The quantification and arrangement of plantings is not provided.

*The Arboricultural Report*

- Although the site was revisited (a brief inspection only) in May 2009, the report was prepared in April 2002. It is questionable whether the information provided 8 years ago is still adequate or satisfactory in respect of actual trees on site ( regrowth would have occurred), tree health, condition and size. The report should be updated in detail.
- The report fails to provide an analysis of actual tree removals required for the proposed development, nor is there any assessment of likely impacts of development on trees to indicated to be retained.
- The report fails to identify the quantum of vegetation removal. Impact on vegetation and the feasibility of retention is relevant to any conclusions drawn with respect of impact assessment in relation to fauna, flora and vegetation communities and therefore the impacts are not described. This is particularly relevant in the first stage for those trees to be retained which would however appear to be affected by construction.
- The report fails to reference the appropriate *Australian Standard 'Protection of trees on development sites As 4970- 2009.'*
- The report fails to consider tree protection prior to and during construction. Tree protection is considered critical to retention of trees at this stage.

*Landscape plans:*

*Stage 1 landscape plan:*

- The landscape plans for stage 1 fail to indicate the area/s of low water/ indigenous planting required to meet the landscape BASIX certificate commitments for this stage.
- The proposal fails to provide external levels either proposed or existing on the landscape plan and other plans.
- No information has been provided in relation to the adequacy of or depth of soil over basement areas where tree and screen planting is indicated.

- Existing vegetation to be retained and or removed is not identified in number, position or species on the detailed landscape plans.
- The scale is too small: a minimum of 1:200 is required to enable adequate assessment for Stage 1.

*Concept plan landscape plan:*

- The scale is too small to allow adequate assessment. A minimum of 1:300 is desirable for the concept plan;
- The areas marked as deep soil are incorrect, as they include areas over basement;
- The plans fail to show the extent of excavation and fill;
- The plan fails to provide external levels either proposed or existing.
- No detail is provided on width or accessibility of pedestrian paths through site, or to communal areas.

*Heritage reports:*

- No archaeological investigation into the site or an assessment of the potential archaeology of the site by a recognized archaeologist as required in the Director Generals Requirements;
- The Aboriginal Heritage Advice is a preliminary assessment, no consultation has been undertaken with Aboriginal stakeholders and as such it does not conform to the Department of Environment, Climate Change and Water's (DECCW) Aboriginal Cultural Heritage Standards and Guidelines Kit (2004) or the 'Draft guidelines For Aboriginal Cultural Heritage Impact Assessment and Community Consultation 2005' as required in the Director Generals Requirements for Heritage;
- Heritage impact statement submitted is largely irrelevant as several of the buildings proposed for demolition were delisted in Town Centres LEP.
- The scope of the heritage impact statement is limited because it does not assess the impact of the development on the nearby heritage items or suggest any ways of mitigating the impacts. It simply states the consultant was not involved in the design/development.

*Site plans:*

- There is no detailed site plan for Stage 1;
- Concept site plan fails to show pedestrian accessways;
- Concept site plan fails to clearly differentiate trees to be retained, and trees to be planted;
- Concept site plan fails to identify communal open space areas

*Site survey:*

- Fails to accurately identify the trees on the site;
- Fails to identify the additional bend in the riparian zone at the top of the site.

*Traffic report:*

- Fails to apply an appropriate the traffic generation rate. Pymble is unlikely to be considered a "metropolitan sub-regional centre" upon which the report is based therefore, and would therefore the traffic generation is underestimated;
- Fails to consider the cumulative impacts of other development under the Ku-ring-gai LEP (Town centres) 2010 or the site already developed under SEPP 53 in Avon Road.

*Bushfire report:*

- Lack of clarity in regard to Pg 4 - 5.0 Compliance Tables and Notes, p12:
  - The meaning of the reference to 'Arilla Road and maintained residential allotments' and 'Avon Road' as significant environmental features is unclear;
  - The meaning of the reference to 'APZ Existing' in relation to Aboriginal relics;
  - The report gives various references to the presence of Blue Gum High Forest that appear to contradict each other.
- Incorrect map display of areas of bush fire prone land which pose a hazard (p.6 – 6.0 Aerial view of the subject allotment). Refer to the Bush Fire Prone Lands Map;

- The report fails to specify which stations are Fire and Rescue NSW (previously NSW Fire Brigades) and which are Rural Fire Service. As Fire and Rescue NSW are the responsible agency in this area, their locations are possibly more significant than neighbouring Rural Fire Service brigades and will potentially impact on response times.

*Water management reports:*

- No Stormwater Concept Plan is provided as required by the DGRs and as would be expected with a DA for the Stage 1 development. On site detention for the Stage 1 building must be shown as well as the proposed point of discharge – the Stage 1 site is over 50 metres from the watercourse and a pipe would have to be laid to avoid large trees as well as to skirt around the Stage 3 building.

- No MUSIC model was provided as required under Part 5F.2 of the Town Centres DCP 2010. Water quality measures are not shown on the drawings nor are any specifications or details provided.

*Specific to the MYD report (which is for the whole development):*

- Overall, there are not enough details in the form of design or concept plans to support the findings of the report in relation to the reduction in outflows from the site or the maintenance of water quality in the system.
- There does not seem to be a plan showing the stations for the HEC-RAS model.
- The post-development model relies on reshaping of the overland flowpath (ie the riparian zone), but no details are given of the width or extent of the reshaping – the report only states "reshaped downstream of culvert".
- The report refers to three on site detention storages, with no indication which stages each applies to or where they are to be located. The volumes are between 125 and 247 cubic metres so they are of a considerable size.

*Development Contributions Report:*

- Bases its calculation of the likely contributions required on only one of two plans, that have since been superseded, and on a cap on contributions which did not at that time, or now, apply;
- This resulting in a gross underestimation of the contributions.

*Waste Management Plan:*

- Fails to include quantities or destinations of construction waste;
- Fails to provide for separation of waste on site.

*Plan integration*

- The individual reports and plans on which the overall plan is based conflict with each other. The ecological, bushfire, stormwater and landscape and built footprint planning need to be considered in an integrated manner. For instance:
  - Tree canopies are not to be within 2 metres of the buildings under the bushfire report, but are shown to be within this zone on various plans.
  - Deep soil planting is shown on landscape plans where basements are located underneath;
  - Mulching is required under the VMP, but not permitted in the APZ by the Bushfire report.

There does not appear to be a *staging plan*, showing how the development will be constructed stage by stage. This is of particular concern, given:

- The building in Stage 1 will be affected by the access to most of the rest of the site for future stages,
- The ecological significance of much of the site;
- The connected basements through the eastern area of the site;
- The proximity of excavation close to boundaries.

**Isolated sites**

Clause 3C.5 of the *Ku-ring-gai Town Centres DCP 2010* (KTCDCP 2010) provides controls for the consideration of development where it would cause adjoining parcels of land to be isolated. The development scheme results in the isolation of 2 & 6 Beechworth Rd, 12 Mayfield Rd and 3 Avon Rd. The extent of isolation is such that only 6 Beechworth would be large enough for development in accordance with the KLEP, however the available FSR

would result in a residential flat development of limited scale and potentially unviable. In some cases the isolated lots would not meet the minimum standards in the Ku-ring-gai LEP (Town centres) 2010 for multi dwelling housing or residential flat development (eg 12 Mayfield does not meet the minimum frontage control in Clause 6.1). The allotments concerned would not be developable as envisaged by the controls and therefore the proposal fails to comply with DGR 4.

That said, Part 3C.5 of the DCP requires amalgamation of sites to avoid the above situation and where this cannot be achieve demonstrate to the satisfaction of the consent authority that all reasonable attempts to acquire the affected sites has been made in accordance with the appropriate planning principals of the LEC and that information has been submitted detailing how the isolated sites could be redeveloped in a sympathetic manner to the adjoining properties and the development concerned. This to date has not been done and it is considered that until such time that the matter is explored the proposal has little merit.

Figure 1 Example of impact on isolated site – Redevelopment at 2 Avon Rd Pymble

Further reinforcing the above point is Part 3C.6 which details specific controls for the subject site and those affected by isolation. Importantly Part 3C.6 states that where development is proposed on the subject site, it is to be done so with regard to the site specific controls of *Development controls and design guidelines - six SEPP 53 sites in Ku-ring-gai.* Specifically the controls limit the ability of the consent authority to grant consent to development on the site if it would, or would be likely have, an impact on the ability to develop the remainder of the site in accordance with the site specific controls. It is considered that the current proposal fragments the isolated sites and limits the ability to achieve the type of redevelopment envisaged.

In particular, the following have not been considered:

- Diagrams have not been provided which demonstrate how the isolated sites could be reasonably developed, so as to be consistent with the built outcome of the controls of the KLEP. As it is likely the site would be strata subdivided, it is

unreasonable to conceive that the isolated sites could be developed and consolidated into the development site.

- Little weight should be given at the attempts to consolidate the isolated allotments into the development site as the information tendered relates to discussions pre 2005 (and most pre 2002) (well prior to the recent rezoning process) and is not supported by such documentation as offers of purchase by way of valuations from a registered land valuer and the like. Further, 7 Avon Rd was sold recently, and apparently no offer was made by the applicant.
- It is considered that given the apparent lack of consideration and attempt to resolve the isolation issue that the proposed development is contrary with the necessary considerations established by the planning principal associated with isolation (LEC 10984 of 2003 Grech V Auburn Council).

Critically, the exclusion of these sites from the proposal excludes the more suitable (more level and less vegetated) development platforms of 'site 2', resulting in building footprints within Blue Gum High Forest (a critically endangered ecological community under the *NSW Threatened Species Act 1995*)and the riparian zone.

The isolation issue discussed above also creates many amenity issues for adjoining development, including overshadowing and overlooking of some of the isolated sites, noise and privacy loss to 6 Beechworth Road, as well as internal amenity issues, including orientation, solar access and access to communal open space.

## Site planning

As noted above, the areas of the site identified as 'Site 2' in *Development Controls and Design Guidelines – Six SEPP 53 sites in Ku-ring-gai,* which must be considered under Part 3C.6 of KLEP, (and the superseded SEPP 53), provides for a range of development platforms around the fringes of the site, subject to the location of the critically endangered ecological community and the impact on the streetscape. The exclusion of a number of these more suitable development platforms and the resultant significant intrusion into the Blue Gum High Forest reflects this poor site planning.

The extent to which this proposal ignores the constraints of the site is evident by comparison with 132 – 138 Killeaton Street, St Ives, which is also a Major Project proposal. Table 2 shows a comparison between these sites:

Table 2. Comparison between the Killeaton St site and the Avon/Beechworth Road site

| | **Killeaton Street** | **Avon/Beechworth Road** |
|---|---|---|
| Size | Approx 22,970 $m^2$ | 24,951 $m^2$ |
| Constraints | Virtually none – flat, trees only along boundary | Highly constrained – Blue Gum High Forest, steep topography, riparian zone, proximity to rail line, bushfire prone land |
| No of units proposed | Approximately 300 | 350 |
| FSR proposed | 1.3:1 | >1.4:1 |

Both *Development Controls and Design Guidelines – Six SEPP 53 sites in Ku-ring-gai,* and the KLEP recognised these constraints on the subject site, through a lower FSR than that allowed other sites for high density. The constraints were considered so severe, that, although the height limit for residential flat buildings is generally 5 storeys (17.5m) Council permitted 7 storeys (23.5m) over a large part of the site, recognising the need to severely

limit the building footprint, even with an FSR of 0.8:1. The comparison with the Killeaton St proposal clearly demonstrates that the proposal fails to adequately consider these constraints in its site planning and that the proposal is an overdevelopment of the site.

**Bulk and scale**

The development per the height controls of the Ku-ring-gai Town Centres LEP 2010 (KLEP) allows a spilt maximum building height of 23.5m on the western half of the site, with the eastern portion of the development site (which includes those properties which face Avon Rd) being limited to 17.5m.

A number of breaches of the maximum building height are proposed, which are in part driven as a consequence of the development's FSR, which significantly exceeds the maximum permissible 0.8:1 imposed upon the development by the KLEP and the 0.63:1 of the now superseded SEPP No. 53. It is noted that were all the sites identified as 'Site 2' included in the proposal, the total site area would be 29,749m$^2$ and the proposed development would still have an FSR of more than 1.17, well in excess of that provided for under the KLEP. If it were possible to redevelop the isolated sites, the overall FSR would be even higher.

Further to this, building height has not been properly considered, noting that building height is measured from existing ground level rather than the stated natural ground level, as well as basement levels and the like not being properly considered and addressed.

The non-compliance with the FSR and height standards in the KLEP is reflected in the visual dominance of the built form, both to surrounding streets and to neighbouring development. For instance, building 2 is 10 to13m higher at the roofline than 3 Avon Road, with the additional bulk and height of building 4 located to the rear. The impact will be exacerbated by the likely loss of the trees at the rear of 3 Avon because of the excavation for building 2, and by the inadequate separation to the dwelling on 3 Avon (about 11m). If the proposal is permitted to isolate 3 Avon Road, it should meet the 9m setback requirements to the fourth floor and above, as required under the KTCDCP for residential flat buildings adjacent to low density development. The proposal is out of scale with the scale and character of the locality, and the heights are well in excess of any residential building in Ku-ring-gai.

The failure to step the height of the buildings down with the fall of the site towards the centre of the site, (in fact the roofs step up, as the ground level slopes) exacerbates the impact of the bulk and scale of the development.

General bulk and scale issues exist with the poor transition through the site (noting the significant fall from the adjoining rail corridor to Arilla Rd) and the significant mass along the eastern boundary by building 3.

It is noted that the *Development controls and design guidelines* provide for up to 5 storey development only. In recognising the constraints of the site, Council increased the permissible height to 7 storeys over much of the site, to allow for a reduction in the building footprint. This height is also exceeded, without reducing the building footprint.

The proponent justifies the excess height and FSR as outlined in Table 3 below. Council's response is outlined in the right hand column of the table. There is no factual basis for the proponent's justification.

Table 3 Proponent's justification for non-compliance with height and FSR

| Proponent's justification | Council comment |
|---|---|
| Size of site | The additional flexibility provided by the size of the site makes it easier to design a development that complies with the controls while still achieving a viable and well-designed development. The size of the site is not an excuse for inappropriate development. |
| Steep topography allows buildings to step down site – effectively reducing scale | A well designed development will clearly follow the topography of the site. The fact that so much of the site is steep should encourage the location of development in the more level areas of the site, retaining the steeper and vegetated areas in as natural state as possible.<br>While the proposed development steps down the site to the south to some degree, the angle of step is very shallow, in comparison to the angle of the ground. Further, the buildings actually *step up* the site from Avon Road toward the creek.<br>As a result the development will appear bulky and out of scale with the surrounding land and development. |
| Consistency with other R4 sites | The proposed height and FSR are well in excess of other R4 sites, most of which have a maximum FSR of 1.3:1 and a height of 17.5m. It is acknowledged that the allowable FSR under the KLEP is less than that for other R4 sites, (while the same as R3 sites in the LGA) but this is due to the fact that the site has such significant constraints. The R4 zoning, rather than an R3 zoning, recognises that the constraints can be better addressed through residential flat building than town house development as permitted under R3. |
| Lack of need for internal roads | The proposal includes a number of internal roads, though not to the extent outlined under SEPP 53 documents. The traffic report is based on rates that are not suitable for Pymble, and therefore has not demonstrated that the main internal road is not required. |
| Does not result in undue impacts | Significant adverse impacts result from the non-compliances as outlined elsewhere in this submission. |
| Need for higher density close to services and infrastructure | The KLEP provides for increased density close to services and infrastructure. The provision of additional housing over and above that provided for under the KLEP should not be used as an excuse for the overdevelopment of a site. |
| Presence of screening vegetation | On the western side towards the centre of the site this is indeed correct. However, while the site is currently well vegetated, much of the current screening comes from extensive weed infestation, including noxious weeds, where no attempt has been made over many years to control these.<br>The screening vegetation along a number of other boundaries is proposed be removed, with basements almost to the boundary in some locations, preventing replanting of species that would grow to a height and density to provide screening. |

## Ecological impacts

An accurate assessment of the impact on the Blue Gum High Forest community, listed as Critically Endangered Ecological Community under the *NSW Threatened Species Conservation Act 1995*, cannot be made due to the inadequacies of the flora and fauna report. However, the following comments are provided following a site visit:

- The placement of buildings 4 & 5 is contrary to part 1 section 3 objective (a) of the *Threatened Species Conservation Act 1995*,

  *'to conserve biological diversity and promote ecologically sustainable development'.*

  Buildings 4 & 5 will result in the removal of ten (10) Sydney Blue Gum (*Eucalyptus saligna*) trees. The removal of trees 55-58, 93-96, 102, 105 & 106 will decrease the canopy connectivity of the BGHF within the site and locality. The removal of these large canopy trees will further fragment the BGHF community and result in a decrease in ecological processes such as the dispersal of, pollen & gene flow (Cross-pollination) and recruitment which contribute to the survival of the Blue Gum High Forest community within the site & locality. The proposed replacement planting will not become established to the current height of the BGHF canopy for 20+ years.
- No building or excavation should be permitted within the riparian area to ensure that the canopy trees which comprise part of the BGHF community are protected from severe impacts.
- Proposed building 5 will require extensive modification of the canopy of T100, a large Sydney Blue Gum (Eucalyptus saligna) which has a Tree Protection Zone (TPZ) of 12 metres. The residential flat building will have extensive earthworks within 3.3m structural root zone (SRZ) which is likely to decrease the long term health and viability of the tree.
- Further, the location of building 5 within the canopy of this tree is inconsistent with the requirements of the bushfire report in relation to the maintenance of the Asset Protection Zone.

*Proposed Vegetation Management*

- The retention and restoration of the western area of the site is strongly supported.
- The VMP proposes revegetation not regeneration which is contrary to the best practice guidelines. Many blue gum high forest plants can survive for decades as seeds stored in the soil – the seedbank (DECC 2008). The seedbank is the key to regeneration (DECC 2008). However the VMP should be amended to provide for regeneration.
- The VMP proposes mulching. Mulching Blue Gum High Forest will prevent BGHF seeds from germinating (DECC 2008). Mulching is also inconsistent with the recommendations of the Bushfire Report.
- The VMP proposes plantings but fails to quantify the number of plantings and their spatial arrangement which is of particular importance as the site is proposed to be managed as an Inner Protection Area (IPA).
- The VMP maintenance period is proposed to be 12 months, however the Gantt chart shows 24 months. In other locations within the documentation a year period is referenced as being sufficient to be self sustaining. This is not possible as acknowledged by Section 11 (a) of the VMP which states *'The time frame for complete eradication would be lengthy, considering the size of the site'.* The proposed 24 month maintenance does not reflect the aforementioned statement. It is recommended that the VMP be extend to a minimum of 5 years.

### Riparian protection

The applicant claims that the watercourse running through the site should not be considered a watercourse, as it is not defined as such in any legislation. However, the definition of a 'river' under the *Water Management Act 2000* states:

> *'(a) any watercourse, whether perennial or intermittent and whether comprising a natural channel or a natural channel artificially improved, and*
> *(b) any tributary, branch or other watercourse into or from which a watercourse referred to in paragraph (a) flows, and*
> *(c) anything declared by the regulations to be a river, whether or not it also forms part of a lake or estuary, but does not include anything declared by the regulations not to be a river.'*

The watercourse on the site is intermittent, and includes both natural and modified channel. It clearly falls under the definition of a river. Further, as it is within a fairly natural area at the top of the catchment, impacts on this watercourse have impacts on water quality right down to the Lane Cove River at the bottom of the catchment.

The proposal fails to adequately protect the riparian zone:

- The riparian zone identified fails to include the waterway that bends to the north east (from the pipe under the railway. This is shown on the Stormwater drawings, but not on the main plans;
- Buildings 3 and 4 intrude into the core riparian zone (CRZ);
- Further clearing into the CRZ will be required for the Asset Protection Zone around buildings 3 and 4;
- Further impacts will also result from the excavation and movement area required to construct buildings 3, 4 and 5;
- Stormwater devices appear to be located within the core riparian zone, which is inappropriate;
- The MYD report states that there will be reshaping of the riparian zone below the culvert, but provides no plan or detail. Accurate assessment of the impact is therefore not possible, however, such reshaping is not consistent with best practice;
- The design is therefore inconsistent with the Landscape Design controls in 'Development Controls and Design Guidelines -Six SEPP 53 sites in Ku-ring-gai' and therefore SEPP 53 (if SEPP 53 is determined to apply);
- The design fails to adequately address Clause 6.6 of the Ku-ring-gai LEP (Town Centres) 2010.

It is recommended that:

- The development be set back further from the CRZ (with the Asset Protection Zone also outside the CRZ);
- The basement design incorporate measures to ensure that groundwater and subsurface flows are redirected towards the riparian area, released outside but adjacent to the CRZ.

## Bushfire

The incorrect mapping is reflected in the report's reference to the effective slopes most significantly influencing bushfire behaviour as those to the south. The report has not considered the hazard to the east. An assessment is required to determine whether the proximity of the vegetation to the east of the proposed development would have an influence on any buildings/ infrastructure, particularly that within the bushfire prone buffer that extends into 1, 1A, and 5 Avon Road and along the access way at no. 1 Arilla Rd. Should this vegetation be determined as likely to influence the development, the construction levels would need to be increased.

Regeneration/ reconstruction of the Blue Gum High Forest (BGHF) community on the site is encouraged, however, a number of other project plans and reports are not consistent with the maintenance and management regime as specified in the report in accordance with Appendix 5 of Planning for Bushfire Protection 2006.

Given that only a portion of the subject site is bushfire prone, the Asset Protection Zone proposed across the entire site may be unnecessary, (subject to an assessment of the requirements due to the hazard to the east). Alternately, the potential for increasing the construction level to reduce the width of the APZ should be investigated. This would maximise the potential for regeneration of the BGHF on the site, while minimising the ongoing management of such a large area as an APZ into the future. It may also the closer placement/retention of vegetation near buildings, to address some of the concerns expressed in other sections of this submission.

Similarly, it is unclear if all driveways across the site are required to meet the minimum 6.5m width and 4m height clearance. The proposed access road off Arilla Road for instance does not meet this criteria, especially as shown on the landscape plan. Even the access road off Avon Road is described as only 6.1m in the SEPP 65 assessment, and therefore would not comply. It is noted however, that the site plan appears to show 6.5m from Avon Rd, which would comply in this area. The assessment should also consider whether the Beechworth Road access requires this width. The separate entry and exit do not appear to be a requirement for bushfire planning and should be deleted.

## Streetscape and amenity of neighbouring development

*Setbacks*

- The street setback to Avon Road is only 5m to the courtyard walls, limiting the ability to provide for tall trees consistent with the character of the street, or to soften the appearance of the bulk of the structures. While the front setback to the higher levels generally complies with the *Development Controls and Design Guidelines*, the size of the proposed building is much larger than those proposed under the Guidelines. Recognising the additional impact of the larger building, the setback should be increased to at least the setback of the neighbouring dwellings.
- Limited setbacks to the eastern residential properties to Avon Road (including 15 Avon Rd which is zoned for low density) limits the opportunity for dense screen landscaping, which restricts the opportunity to screen the development and minimise its impact.
- Such screening becomes impossible given that the basement extends almost to these boundaries along a significant length of these boundaries.

- These setbacks do not comply with the objectives or the controls in the KTCDCP (including Part 3C.6 which refers to the *Development Controls and Design Guidelines*).

*Visual and acoustic privacy*

The proposal results in unacceptable impacts on visual and acoustic privacy:

- An increase in the noise and loss of privacy for the residents of 6 Beechworth Rd, particularly as a consequence of the driveways supporting the development surrounding the 3 side and rear boundaries of the site.
- Significant overlooking of the open space areas of 2, 6, 10A & 10B Beechworth Rd, 3, 7 and 15 Avon Rd. Notwithstanding this the height of the development together with topography of the subject site is such that overlooking will indirectly occur within a much larger reach.

*Overshadowing*

- In the case of overshadowing, insufficient information has been provided to enable a comprehensive assessment of the development's impact upon adjoining properties, noting the requirements of Clause 3C.17 of the KTCDCP and SEPP 65, which require at least 3 hours of sunlight between 9am and 3pm at the winter solstice to the living areas and the principal portion of the private open space of the adjoining residential dwellings. It appears unlikely that this requirement will be satisfied. Given the generous site area, adjoining low density residentially zoned land and site specific controls of *Development Controls and Design Guidelines - Six SEPP 53 sites in Ku-ring-gai,* it is reasonable that the development comply with respect to overshadowing. The proponent refers to the 2 hour solar access requirement in the *Residential Flat Design Code*, noting that the area is urban. However, the 2 hour solar access provision relates to locations within the city area, not a suburban area such as Pymble.

- It is noted that were the development to comply with maximum building height and FSR controls, the impacts associated with overshadowing would be limited. Further, if the development site included the isolated sites there would be significantly reduced need to intrude into the gully, where it is unlikely that adequate solar access can be provided to the dwellings.

*Visual impact*

- The height of the buildings within the development and the poor relationship of the height of the development with the topography of the site is such that, visually, the development will dominate the outlook from the low density residential properties which surround the subject site and which currently have views to/through the bushland on the site. The impact on the views of the surrounding residents will be most pronounced along Arilla Rd, as well as Mayfield Ave and Avon Rd.
- It is considered that in the case of the eastern adjoining properties along Avon Rd, particular attention needs to be paid to the design by utilising solid or non transparent balustrades and louvered screen to balconies as a screening mechanism.
- That said, the configuration of the development, particularly blocks 2, 4 and 5 offer limited opportunities for views over passive recreation and landscaped areas.
- A view line analysis is required to accurately assess the impacts on the streetscape and the locality.

### Landscaping and deep soil

- The landscape setback to Avon Road does not provide sufficient space for large canopy trees or layered screen planting of a scale commensurate with the proposed development and consistent with the landscape character of the area.
- In a number of instances, space for screen planting shown in some areas is too narrow to support species that could achieve sufficient height to screen the development from the neighbouring sites – eg to Nos 3, 7 and 15 Avon Rd, 6 Beechworth Rd.
- It is considered that basement areas are likely to compromise the establishment of tree planting proposed adjacent to the southern side of stage 1 building and to the southern side of the entry road for this stage.
- There is inadequate provision for substantial screen plantings along the along the access road and adjacent property for stage 1.
- There is inadequate provision for substantial screen plantings along the along the northern boundary to the adjacent property for stage 1. Basement areas may compromise plantings in these areas. Plantings are not considered of a size sufficient to provide amenity screening to the proposed building.
- The stage 1 landscape plan relies upon retention of existing trees and vegetation some of which will be directly and or indirectly impacted by construction of the proposed basement in these areas.
- Planting of screen and substantial trees is shown over areas of basement and will therefore not be achievable.

### Amenity of future residents

*Open space*

Communal open space is inadequate:

- The orientation of the development is such that buildings 1, 2, 4 and 5 have poor linkage with the large area of communal open space in the south western corner of the site;
- While the site has retained areas within the Blue Gum High Forest, these areas are accessed via stairs, and are therefore not accessible to those with a disability;
- Functional areas, close to the buildings are not shown on the site plan for the overall concept, therefore it is difficult to assess the extent to which they will be provided;
- The stage 1 landscape plan shows an area that may fulfil a role as communal open space, presumably to be shared between Stages 1 and 2. However, as it is located above a basement, it does not include deep soil areas as required by the '*Development Controls and Design Guidelines*'.

*Solar access*

- In the case of solar access, no information has been provided which demonstrates that the necessary solar access provisions can be afforded to 70% of the units within the development, as required in *Development Controls and Design Guidelines- Six SEPP 53 sites in Ku-ring-gai* and under SEPP 65.

*Rail corridor -acoustics and ventilation*

- The setback to the rail corridor is inadequate. While specific glazing can be applied for some parts of the development, the need for alternate ventilation for so many of the units due to the need to keep windows closed to maintain acoustic privacy is unacceptable from an amenity viewpoint. Again, this is a result of poor site planning.

*Other SEPP 65 issues*

A detailed assessment under SEPP 65 has not been carried out by Council, however, the following additional issues with SEPP No. 65 are noted:

- The building depth for stage 1 is too wide, and results in a number of other non-compliances, in relation to daylight access and ventilation;
- A number of units have their kitchens more than 8m from a window;
- The number of single aspect apartments limits the opportunity for cross ventilation, with more than 10% of units facing south east / west being single aspect. Also 60% of units are not cross ventilated;
- Less than 25% of units provide natural ventilation to the kitchens;
- Pedestrian entry from the street to Stage 1 lacks definition;
- An additional entry and lift well should be provided to Building 1, to minimise the length of hallways and number of units accessed from each lift well. The proposed building 1 would have the feeling of a motel, rather than a residential development. Further, some of these hallways are only 1.5m wide;
- The ground floor apartments should be designed in a manner whereby they have access to at grade open space;
- Screening is required to enable external clothes drying as required by the BASIX commitments;
- A lack of storage has been afforded to the units within the development.

**Traffic and access**

*Car Parking and Access*

Specifically, for residential flat building sites in town centres, parking provision is required in accordance with the Ku-ring-gai Town Centres DCP. As a comparison, the car parking requirements under the *Development Controls and Design Guidelines* are also shown in the following table, which outlines the car parking requirements for the proposal, and compares these requirements to the quantity of car parking proposed:

Table 4 Stage 1 parking

| Land Use | Ku-ring-gai Town Centres DCP (2010) parking requirement | Development Controls and Design Guidelines parking requirement | Proposed parking |
|---|---|---|---|
| Residential:<br>0 x Studio<br>22 x 1 bedroom<br><br>22 x 2 bedroom<br><br>7 x 3+ bedrooms (51 total)<br><br><br>Visitor<br><br><br><br>Total parking required | 0 (min) - 0.5 (max) = 0<br>0.7 (min) - 1 (max) = 15.4 (min) - 22 (max)<br>1 (min) – 1.25 (max) = 22 (min) – 27.5 (max)<br>1 (min) – 2 (max) = 7 (min) – 14 (max)<br><br>1 space/4 units = 12.8<br><br><br>Total res. parking = **58 (min) – 77 (max)**<br>**58 – 77** | 0 (min) - 0.5 (max) = 0<br>0.5 (min) - 1 (max) = 11 (min) - 22 (max)<br>0.8 (min) – 1.6 (max) = 17.6 (min) – 35.2 (max)<br>1 (min) – 2 (max) = 7 (min) – 14 (max)<br><br>1 space/10 units (min) - 1 space/5 units (max)<br>= 5.1 (min) – 10.2 (max)<br><br>Total res. parking = **41 (min) – 82 (max)**<br>**41 - 82** | **86** |

From table 4 above, the total parking provision for Stage 1 that would be required under the provisions of *Development Controls and Design Guidelines*, would be 41 - 82 car spaces. This total also aligns closely with the total required under the Ku-ring-gai Town Centres DCP (58-77). However, the proposed provision of 86 car spaces exceeds the upper limit as required under the Ku-ring-gai Town Centres DCP (2010) and *Development Controls and Design Guidelines*. From the allocation of spaces, there are also more visitor car parking spaces than required Ku-ring-gai Town Centres DCP.

The parking ranges for the town centre plans were designed to encourage the use of public transport and local services, to support local services, and to reduce car use. Under the definition of floor space ratio, additional parking surplus to Council requirements is part of the floor space ratio. The FSR calculated for the proposal does not include this area. The additional spaces contribute to the amount of excavation required on the site, and reduce the opportunities for deep soil planting between buildings.

It is also noted that parking spaces are not dimensioned and there appears to be an excessive number of tandem spaces.

In terms of the vehicle access points, the Ku-ring-gai Town Centres DCP requires that for car parks with 25-100 spaces accessed off a local road, that the access point should be 3.7m-6m wide. The proposal shows a vehicular access point approximately 6.5m wide, which would be adequate for Stage 1. This access point is to share the access needs of Stages 2, 3 and 4 with another 2 future access point further north on Avon Rd, each approximately 6.5m wide. The total spaces indicated on the plan that would be serviced by these 3 access points would be 263 spaces. The width of the proposed access points is considered to be satisfactory for this number of car parking spaces.

The vehicular access from Arilla Rd is considered undesirable as it increases the traffic flow along Arilla Rd which is otherwise a local road in a low residential area. It is considered that access to the site should be limited to Avon and Beechworth Roads so as to limit the impact of the development on the adjoining low density residential sites.

It is acknowledged that access via an access handle benefits the development site from Arilla Rd. This access would be better served as a pedestrian access through the site, linking Arilla Rd with Beechworth Rd. It is considered that such pedestrian access through / around the riparian corridor would help engage this area as a passive recreation space. Ideally, this thoroughfare would be publicly accessible; however negotiation about access and maintenance may be required to enable this.

*Bicycle parking and facilities*
The Ku-ring-gai Town Centres DCP and *Development Controls and Design Guidelines* also require bicycle parking to be provided in residential flat buildings in accordance with the rates in table 5.
Table 5. Bicycle parking

| Land Use | Ku-ring-gai Town Centres DCP (2010) parking requirement | Development Controls and Design Guidelines parking requirement | Proposed parking |
|---|---|---|---|
| Residential:<br>0 x Studio<br>22 x 1 bedroom<br>22 x 2 bedroom<br>7 x 3+ bedroom<br>(51 total) | 1 space/5 units for residents (within residential car park) = **11** | 1 space/3dwellings (min) for residents = **17 (min)** | Bicycle parking area indicated on plan, but number of spaces not detailed |
| Visitor | 1 space/10 units for visitors (within visitor car park) = **6** | 1 space/10 dwellings (min) for visitors = **6 (min)** | |
| **Total parking required** | 16 | 21 | |

The main concern is the lack of bicycle parking detail in relation to residential/visitor parking, as it is unclear whether the required number of bicycle parking can be achieved in the space indicated on the plans. There is also no bicycle parking shown in the visitors area.

*Traffic Generation and Wider Traffic/Transport Context*

The applicant's traffic consultant has applied a peak hour traffic generation rate of 0.29 vehicle trips per dwelling, in accordance with high density residential development rates in the RTA Guide to Traffic Generating Developments. Even though the proposal is for approximately 350 apartments (apartment mix unknown), for their assessment an effective total of 400 x 2 bedroom apartments was used by the traffic consultant, which would yield a peak hour traffic generation of 116 vehicle trips during the am and pm peaks. However, it is considered that the traffic generation rate applied is not realistic for this site as Pymble is unlikely to be considered a "metropolitan sub-regional centre", and would therefore underestimate the traffic generation. These developments would probably generate traffic at the lower end of the medium density residential development rates, or 0.4 vehicle trips per dwelling. This would result in 160 vehicle trips during the am and pm peaks (for 400 x 2 bedroom apartments).

During the planning of the Pymble town centre (which culminated in the gazettal of the Ku-ring-gai LEP (Town Centres) 2010), Council engaged Arup transport planners to undertake an area-wide traffic study of the Pymble town centre. This study examined the existing traffic situation, and considered the cumulative traffic generating impacts of redevelopment under the LEP. It also considered various traffic flow and intersection

improvement options around the Pymble town centre. In the study, the yield for this site was considered to be 210 dwellings, significantly less than the 350 dwellings proposed. Consequently, the traffic impacts of this proposal are likely to be significantly higher than those allowed for in the Pymble town centre traffic study.

The 2 signalised intersections on Pacific Highway in Pymble were found to be operating at capacity in both am and pm peaks, and approach capacity on Saturday peak hour. As a consequence, Livingstone Avenue experiences significant delays during the pm peak, and the right turn bay from Pacific Highway into Livingstone Ave regularly overflows during peak periods. The study area extended as far north as the intersection of Pacific Highway and Telegraph Rd, and as a result, conditions at the intersection of Pacific Highway/Beechworth Rd/Bobbin Head Rd were not considered. While a number of opportunities were considered during the LEP process, the close proximity of Pacific Highway and the North Shore railway line combined with limited east-west crossing opportunities presented a major barrier to providing major access improvements.

The result of the traffic modelling also indicated that traffic generation of the Pymble town centre redevelopment would further deteriorate the performance of the 2 signalised intersections on Pacific Highway in Pymble. The results also indicate that the capacity of the intersection of Livingstone Ave/Everton Rd/Orinoco Rd would be exceeded during the am peak. Although limited opportunities became evident during the study (due to the constraints mentioned above), the following traffic improvement measures in the vicinity of the site were recommended:

- Minor capacity improvements at the Pacific Highway/Livingstone Ave intersection, by widening on the northern side of Pacific Highway to provide 3 northbound lanes. However, this would only result in a minor improvement due to the fact that there are only 2 northbound lanes on the bridge over the North Shore railway line; and
- Provision of a new road between Avon Rd and Beechworth Rd, to improve local connectivity.

Works at Pacific Highway/Livingstone Ave intersection have been scheduled and costed in the Ku-ring-gai Contributions Plan (2010), while the new road between Avon Rd and Beechworth Rd would form part of the redevelopment of this site.

*'Development Controls and Design Guidelines' and proposed road along rail corridor*

The design principles in the draft development controls and design guidelines for the SEPP 53 sites in Ku-ring-gai propose the extension of the existing street along railway corridor [Avon Rd] to create new address for higher density development and to provide a local link within Pymble. It was also noted in Arup's Pymble town centre traffic study that the extension of Avon Rd was foreshadowed infrastructure that would improve connectivity between Avon Rd and Beechworth Rd.

Given the expected future traffic conditions around Livingstone Ave during the am peak as a result of growth in the Pymble town centre, it is likely that residents of this proposal will seek alternatives to access Pacific Highway. As a result, it is expected that demand would increase in Beechworth Rd as an access point to Pacific Highway. This highlights the need to provide the extension to Avon Rd under the current proposal. However, the road carriageway width could be reduced to 8.5m wide rather than the 11m that foreshadowed

by the design principles in the *Development controls and design guidelines for the SEPP53 sites in Ku-ring-gai.*

If it is considered that the extension of Avon Rd cannot be provided, it is recommended that the number of dwellings be reduced to, at a maximum, those originally foreshadowed in the Ku-ring-gai LEP (Town Centres) 2010, so as to minimise additional impacts to residents along Arilla Rd, Mayfield Ave and parts of Allawah Rd. Note that Council's final yield calculations submitted as part of the Town centres planning was for 185 units on 'Site 2' as a whole (that is, including the subject site and all bar one of the isolated sites).

*Conclusions*

Modest transport improvements are proposed in the Pymble town centre to assist in accommodating future traffic demands. Clearly, though, the additional development on the subject site (over that originally foreshadowed) would have significant additional traffic generation impacts.

Of concern are:

- The proposed provision of 86 car spaces for Stage 1 exceeds both the requirements of the Ku-ring-gai Town Centres DCP and *Development Controls and Design Guidelines;*
- The lack of bicycle parking detail in relation to residential/visitor parking. There is also no bicycle parking shown in the visitors area;
- The higher number of dwellings on the site and the underestimation of traffic generation, which would result in additional traffic impacts over the expected number of dwellings foreshadowed in the Ku-ring-gai LEP (Town Centres) 2010;

Should the proposal be approved at the current proposed FSR, then the extension of Avon Rd along the railway corridor is required to improve local traffic links, and should be part of the approval. However, should the Department consider that the extension of Avon Rd is not necessary, or conflicts with environmental objectives, then the number of dwellings should be dramatically reduced. Even at the dwelling levels foreshadowed in the *Ku-ring-gai LEP (Town Centres) 2010* the connecting road is desirable. Investigation of a potential route (perhaps at a reduced width) that minimises the impact on Blue Gum High Forest should form part of any future proposal.

**Heritage**

With gazettal of the Town Centres LEP in May 2010, 3 heritage items on the subject site were delisted. The properties are:

- 1 & 5 Avon Road; and
- 6 Beechworth Road.

The report is dated December 2009 and prepared before gazettal of LEP Town Centre and adoption of the Town Centres DCP. The report is a little confusing as it states its scope is limited to considering demolition of No 1 & 5 Avon Road and construction of a medium density residential building on the site and how these demolitions would facilitate development of the overall site. Much of this information is irrelevant as these sites are no longer heritage items and as such little weight can be given to their heritage value when demolition is proposed.

The report then provides some general comments on the impacts of the "indicative buildings" in Stage 2, 3, 4 & 5.

The report does not focus its attention to provide a critical analysis of the scheme or the impact of the proposed development on the nearby heritage items. There are a number of listed items within the vicinity of the site including:

- 178 Pacific Highway – "Grandview",
- 1186-1188 Pacific Highway – former "Sacred Heart Church & Presbytery",
- 1202 Pacific Highway - "Colinroobie",
- 1228 Pacific Highway - "Mountview",
- 9 Beechworth Road,
- 11 Arilla Road,
- 11 Avon Road _"Macquarie Cottage"; and
- 19 Avon Road.

The proposal appears to have taken a view that high density development will inevitably affect heritage items and provides no helpful advice on how the impacts could be reduced or mitigated. The report does not comment on whether the proposed development is appropriate. In fact the report states that the scale 'allowable' would irreversibly alter the historic views to and from the subject site.

*"The entire residential area ought to be considered as being in transition under which all heritage properties will succumb to a variation in setting and visual curtilage".*

In relation to the Stage 1 development it takes the view that the design of the building which steps back from Avon Road at the top two levels reduces its apparent bulk and scale, the materials would provide *'some sort of cross reference to the architectural features, particularly the verandas and eaves overhangs consistent with the Inter War architectural style of the surrounding built environment'.* The report finds the Stage 1 development would be within the visual catchment of 11 & 19 Avon Road and 11 Arilla Avenue would alter the "viewscape" of these sites and the scale would affect the views of these heritage items. Landscape screening is the only suggested mitigating element.

In relation to Stage 2, 3, 4 & 5, the report only makes very general comments and suggests that the scale is appropriate as the higher scale development would be on low ground and thus have less effect on surrounding properties and streetscape.

The conclusions in the report suggest that all future development should be of high quality architectural design and that the design by Anchor Murray, Woolley Architects achieves this.

The only actual recommendation is that photographic recording of the buildings at 1 & 5 Avon Road be made prior to demolition.

**Impact of proposed development on heritage sites**

No 11 Avon Road, 'Macquarie Cottage' is a highly intact Hardy Wilson Colonial Revival style cottage set in a mature garden which has a high level of significance. The proposed Stage 1 development in Avon Road is considerably larger in scale that that envisaged in *Development Controls and Design Guidelines* and would impact on the setting of 11, and

potentially, 19 Avon Road. At a minimum the building should be setback further from the street, to minimise this impact. If 7 Avon were to be included, a stepping down the hill to respond to the scale of the cottages at No 11 and 19 Avon Road and the streetscape in general.

As proposed in the indicative drawings, the scale and location of proposed Stage 2, 3, & 4 buildings would have considerable impact on the views from the heritage item at 1202 Pacific Highway "Colinroobie". The item currently has significant views from the Pacific Highway ridge over the two storey component of "Clyde Gardens" (2, 4 & 6 Clydesdale Place) to the Blue Mountains. Future development should be informed by a view and curtilage analysis of the nearby heritage items to ensure that new buildings are planned to retain significant view corridors and curtilage so their heritage significance is not eroded.

Heritage impacts on No 11 Arilla Avenue from proposed Stage 3 & 4 buildings may also occur, particularly as the landform rises on the site well above the level of the item which would result in substantial visual and physical domination.
A detailed assessment of the potential impacts is required.

**Stormwater management**

The lack of a stormwater plan and Music Model makes the assessment of the impacts impossible. A detailed stormwater plan is required to assess whether the proposal meets the requirements of the *Development Controls and Design Guidelines* and the DCP in general, both in terms of quantity and quality management. This is an integral part of the design and cannot be left to construction certificate stage.

The BASIX water commitments include a 10 000 litre rainwater tank with re-use for irrigation and car washing. This low level of re-use is below what would be expected of a WSUD development.

**Waste management**

The Waste Management Plan in Appendix 33 only contains Part 4 Ongoing Management. This is not consistent with the DGRs which requires *'Details of where all excavated material leaving the site is to be placed.'*

The Stage 1 development will require 25 garbage, 13 paper recycling and 13 mixed recycling containers (240 litres). The garbage collection room on Level B1 seems to have sufficient space for the required number of containers (although not dimensioned).

The Waste Management Plan in Appendix 33 states that collection will be from the service road to the west of the building. This road is not part of the Stage 1 development. Internal waste collection in the basement is required. The Waste Management Plan also states "larger storage bins allow reduced number of events during the collection of the waste." The meaning of this statement is unclear.

It appears from the architectural plans that the minimum 2.6 metres headroom required at the entrance to the basement carpark will be available, however this should be confirmed by a longitudinal section through the entry driveway, showing realistic slab and beam depths.

**Development contributions**

The Environmental Assessment Report refers to only one of the two Contributions Plans that applied to the site in October 2010. Both *Ku-ring-gai s94 Contributions Plan 2004-2009 – Residential Development (Amendment 2)* and *Ku-ring-gai Town Centres Development Contributions Plan 2008* applied to this site from their in effect date of 30 July 2008. There is no evidence that latter Contributions Plan has been properly considered. As a result the contributions applying to the development have been significantly under-estimated having been calculated with reference to only one of the two applicable contributions plans.

As a consequence of the apparent omission in respect of the application of *Ku-ring-gai Town Centres Development Contributions Plan 2008* to the subject site, the Environmental Assessment Report incorrectly asserts that the site is subject to a limitation in the maximum contributions in respect of the proposed residential development. This is not the case.

The s94E Direction dated 16 September 2010 stipulates that it does not apply to land listed in Schedule 2 of that Direction. The Ku-ring-gai land in Schedule 2 included under clause (8)(a) is identified by reference to its coverage by both the *Ku-ring Local Environmental Plan (Town Centres) 2010* and *Ku-ring-gai Town Centres Development Contributions Plan 2008*. The subject site, being zoned for higher density development under that LEP and within the boundaries of the Pymble catchment map under that Contributions Plan, was at the time of assessment, and remains, exempt from the s94E Direction that would otherwise have capped the contributions.

On 19 December 2010, *Ku-ring-gai Contributions Plan 2010* came into effect and consequentially superseded both the predecessor Contributions Plans. This is the current Contributions Plan in effect in the Ku-ring-gai Local Government Area applying to the subject site. This Contributions Plans provides guidance in the calculation of applicable development contributions including specific requirements in respect of staged developments.

The dwelling figures given for the site as a whole are preliminary and, in the absence of plans for all stages, it is not possible to assess the design of the units to verify the number of bedrooms for the development as a whole. In this context it should be noted that the current Contributions Plan counts any room capable of being used as a bedroom, as a bedroom, thus, for example, a unit labelled as two-bedroom-plus-study will be counted as a three bedroom dwelling for the purposes of the Contributions Plan. It will also be necessary to verify the size of the dwellings that will demolished and become subject to an entitlement for a credit.

It is emphasised, as demonstrated earlier in this report, that the proposal is considered to be an over-development of the site and should not be approved. Notwithstanding, without prejudice, on the given unit mix, the proposal would be subject to an indicative residential development contribution for the nett additional development of approximately $7.3M (without adjustment for inflation). It should be noted that *Ku-ring-gai Contributions Plan 2010* achieved reductions in most contributions when compared to the combined predecessor Contributions Plans and that this figure represents a reduction in the estimated total contribution that would have applied to the subject development prior to this Contributions Plan coming into effect. In this context it is reiterated that the

Environmental Assessment Report did not provide an estimate of total contributions under *both* of the then applicable contributions plans.

Ku-ring-gai Council is always ready to provide advice in the interpretation and application of the development contributions system in Ku-ring-gai as required.

**Overdevelopment of the site**

The proposal is an overdevelopment of the site. This overdevelopment results in the isolation of sites, adverse impacts on the critically endangered ecological community and riparian area, adverse impacts on the character and streetscape, and the amenity of neighbouring and future residents.

The proposals are inconsistent with the Metropolitan Plan for Sydney 2036, which states that it will help meet Sydney's future housing needs by:

> *'Improving the quality of new housing development and urban renewal by strengthening the Government's role in ensuring good design outcomes'.*

**Recommendation**

It is recommended that the Department of Planning advise the proponent to withdraw the proposals, as they are no longer valid Part 3A proposals, because the reason for their inclusion for assessment under Part 3A is no longer valid. Failing this, it is recommended that the Department refuse the application.

It is recommended that the proponent lodge an amended proposal as a staged DA with Council, which addresses the issues raised in this submission.

**Appendix 2. Brief CVs of authors**

**ANNE CLEMENTS & ASSOCIATES PTY. LIMITED**
**(ABN 41 077 242 365, ACN 077-160-939)**
**Environmental and Botanical Consultants**
**PO Box 1623, North Sydney 2059**
**Phone: (02) 9955 9733, Facsimile: (02) 9957 4343**
**Email:** mail@acabotanic.com

27 November 2012

Anne Clements & Associates is a group of botanists, ecologists and restoration ecologists who specialise in botanical conservation assessment and developing and implementing optimal conservation strategies. The company has more than 25 years of experience in:

- flora surveys of a wide range of ecosystems;
- flora assessments;
- assessments of impacts;
- vegetation plans of management;
- the implementation of rehabilitation/conservation programs as part of sustainable development of sites; and
- environmental management of development sites.

The company works closely with community groups, fauna consultants, town planners, geologists, engineers, lawyers, land developers and mining companies in planning and implementing optimal conservation strategies as part of sustainable development of sites.

Four of the company's environmental managed sites have won excellence awards for their quality and innovations, including "Excellence of Excellence" in 2000, Gold and Silver in NSW Rivercare 2000, Silver and Excellence in NSW Mineral Resources Excellence Awards and Excellence in the Earthmovers Awards, 2006 Environment Award for Australian Property Industry and 2007 International Green Apple Award.

## Brief CVs

The group provides a broad variety of skills and a high level of experience:

**Dr AnneMarie Clements**
Anne holds a M.Sc. (Macquarie Univ.) Thesis - *The vegetation of bushland in the northern Sydney area* and a Ph.D. (Univ. of Sydney) Thesis - *The vegetation of the sand masses of the mid-north coast of New South Wales* and has worked as a plant ecologist for more than 25 years mapping and assessing vegetation, assessing and often ameliorating impacts of developments. Her major research interests include the impacts of urban development on bushlands and soil nutrients, elucidating naturally occurring vegetation patterns, effects of inundation and salinity levels on the distribution of estuarine vegetation (mangrove, saltmarsh, Casuarina fringing forest), effects of metal soil concentrations on plant growth and metal uptake, restoration ecology and re-establishment of components of native flora. She has utilised her research in the implementation of rehabilitation/conservation programs as part of

sustainable development of sites. Anne is a Certified Environmental Practitioner under the Environmental Institute of Australia and New Zealand CEnvP Program and has been a member of the CEnvP NSW certification panel.

**Tony Rodd**
Taxonomic botanist with B.Sc. (University of Sydney) with extensive experience in plant identification. Horticultural Botanist at the Royal Botanic Gardens, Sydney for 13 years (1970-82). After leaving the Gardens, he continued as an occasional consultant, including preparation of interpretative material and collection of plants from the wild for the living collections at the Mount Annan and Mount Tomah Botanic Gardens. He has also worked extensively with book publishers, most recently in the role of Chief Consultant for *Botanica* (Random House 1997) and *Flora* (Timber Press / ABC Gardening Australia 2003), and co-author of *Trees: a visual guide* (Weldon Owen 2008). He has a long-standing interest in the taxonomy of Australian palms and has had a major revision of the palm genus *Livistona* published in the journal *Telopea*. For more than 15 years, he has worked with Anne Clements & Associates on many flora surveys and rehabilitation projects.

**Dr Anne Baumann**
Anne holds a PhD in Agricultural Science, obtained in 2008, Thesis: “Recruitment of *Melaleuca quinquenervia* in the Myall Lakes district”. She is also a graduate of the 2009 National Herbarium of NSW Plant Science Internship. She has an honours degree in Agricultural Science where she majored in horticulture and produced a thesis on urban tree management. In addition she has obtained a certificate in Tree Surgery and Certificate III in Conservation and Land Management from Ryde TAFE. Previous positions include six years as a Quarantine Officer for the Australian Quarantine Inspection Service, three years as a Technical Officer for the Office of Environment and Heritage and one year as a Tree Preservation Officer for Woollahra Council. Anne also has experience in the bushland regeneration industry having worked in both the field and administration.

**Appendix 3a – Photographic record - Site visit June 27 2012**

**Looking along north-east boundary from Beechworth Road railway overbridge**

**Frontage of 5 Avon Road**


**Frontage of 5 Avon Road**

**North-east corner of 5 Avon Road garden**

**1 Avon Road, front of house**

**West side of house at 1 Avon Road**

**Looking south-west across gully from near east end of Transect 1. Tall eucalypts are *E. saligna*, groundlayer and mid-storey smothered by *Ipomoea indica.***

**Looking west across gully from a little south of east end of Transect 1. Large tree with dark green foliage is *Ficus microcarpa.***

**Looking north-east toward head of gully from near Transect 1 - Quadrat 4**

**Looking west across gully from near Transect 1 Quadrat 4.**

**Transect 1**

**Quadrat 1 (0–10 m): edge of recently maintained garden area, with leafless *Ginkgo biloba* (fallen yellow leaves).**

**Quadrat 2 (10–20 m): Smothering by *Ipomoea indica***

**Quadrat 3 (20–30 m): *Lantana camara* and smothering by *Ipomoea indica***

**Quadrat 4 (30–40 m): *Ligustrum lucidum*, *Lantana camara* and *Ipomoea indica***

**Quadrat 5 (40–50 m): *Lantana camara* and smothering by *Ipomoea indica***

**Quadrat 6 (50–60 m): eroded bed of central watercouse in gully, with *Tradescantia fluminensis, Ageratina adenophora, Setaria palmifolia***

**Quadrat 6 (50–60 m): Bed of watercourse with rock rubble revealed by erosion, with *Tradescantia fluminensis, Setaria palmifolia.***

**Quadrat 6 (50–60 m): Sewer manhole. Dense *Tradescantia fluminensis* and *Erythrina* x *sykesii.***

**Quadrat 7 (60–70 m): Tangle of branches of *Abutilon striatum* 6–8 m across**

**Quadrat 8 (70–80 m): *Eucalyptus saligna* with smothering by *Ipomoea indica***

**Quadrat 9 (80–90 m): *Musa acuminata*, *Eucalyptus saligna* with smothering by *Ipomoea indica***

**Quadrat 10 (90–100 m): *Eucalyptus saligna* and *Musa acuminata,* with smothering by *Ipomoea indica***

**House on 8 Beechworth Road, upslope and west of Quadrat 10.**

**Looking north-east across swimming pool on 8 Beechworth Road, showing groundlayer and mid-storey smothered by *Ipomoea indica.***

**View downslope from house and pool on 8 Beechworth Road, with *Eucalyptus saligna, Jacaranda mimosifolia, Schefflera actinophylla***

**Transect 2**

**Quadrat 1 (0–10 m): *Ligustrum lucidum***

**Quadrat 2 (10–20 m): *Ligustrum lucidum* with trunk of *Agathis robusta***

**Quadrat 3 (20–30 m): *Ligustrum lucidum* and smaller *Ligustrum sinense***

**Quadrat 4 (30–40 m): *Ligustrum lucidum***

**Quadrat 5 (40–50 m): *Acmena smithii* (brown trunk at left), *Ligustrum lucidum* and groundlayer of *Tradescantia fluminensis***

**Quadrat 6 (50–60 m): *Ligustrum lucidum* and groundlayer of *Tradescantia fluminensis***

**Central watercourse of gully, downstream from Transect 2**

**Centre of gully looking upstream from near west end of Transect 2**

**Spot location A: *Eucalyptus saligna, Ligustrum lucidum, Tradescantia fluminensis.* Large leaf at left is *Strelitzia nicolai*, intruding from adjacent property.**

**Spot location A: looking downslope toward Transect 2. Mostly *Ligustrum lucidum, Tradescantia fluminensis,* with young *Syagrus romanzoffiana* at centre-right**

**Appendix 3b. Photographic record - Site visit 12 November 2012**

**Tree 98 (surveyors # 39) *Eucalyptus saligna***

**Tree 98 (surveyors # 39) on left and Tree 102 (surveyors # 44) in mid ground both *Eucalyptus saligna***

**Base of Tree 100 (surveyors # 23) *Eucalyptus saligna***

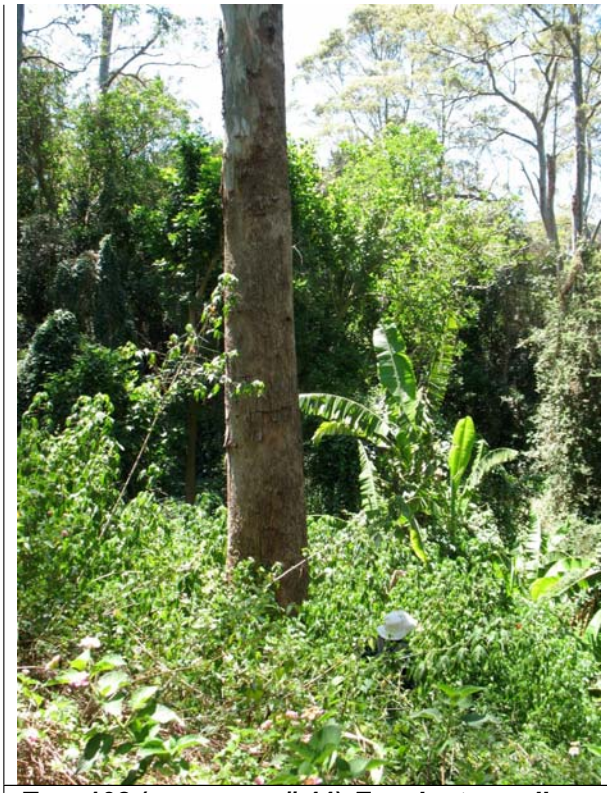
**Canopy of Tree 100 (surveyors # 39)**

**Tree A11 (surveyors # 24) *Eucalyptus saligna***

**Tree A11 (surveyors # 24)**

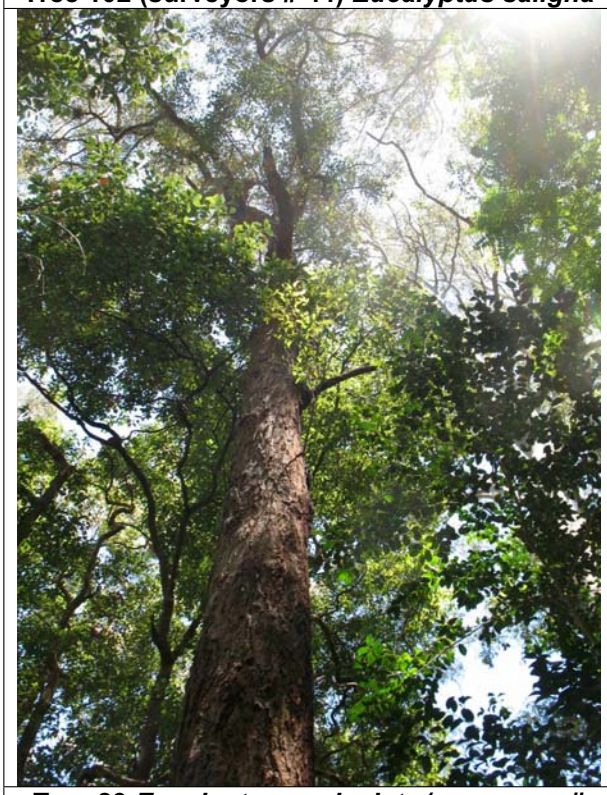
**Tree 110 (surveyors # 49) *Eucalyptus saligna***

**Tree x (not surveyed) *Eucalyptus saligna***



**Tree 102 (surveyors # 44) *Eucalyptus saligna***

**Canopy of Tree 102 (surveyors # 44)**



**Tree 83 *Eucalyptus paniculata* (surveyors # 61)**

**Group of Trees including 85?, 84?, 82?, 81?, & 83 (Surveyors #74, 72, 70, 69 & 61)**

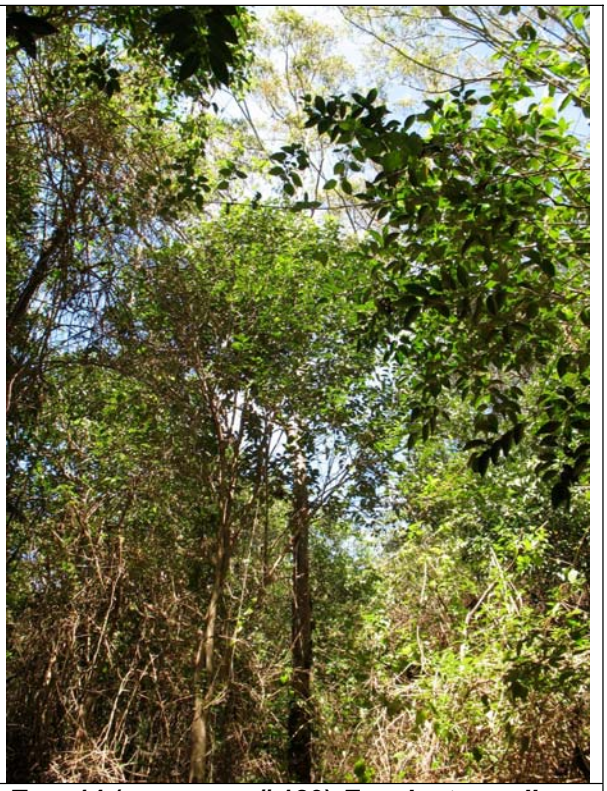
**Tree 64? (Surveyors # 102) *Eucalyptus saligna***

**Tree 63 (not mapped by surveyor) *Eucalyptus saligna***

**Tree A89 (Surveyors # 119) *Eucalyptus saligna***

**Tree 9 (not mapped by surveyor) *Pittosporum undulatum***

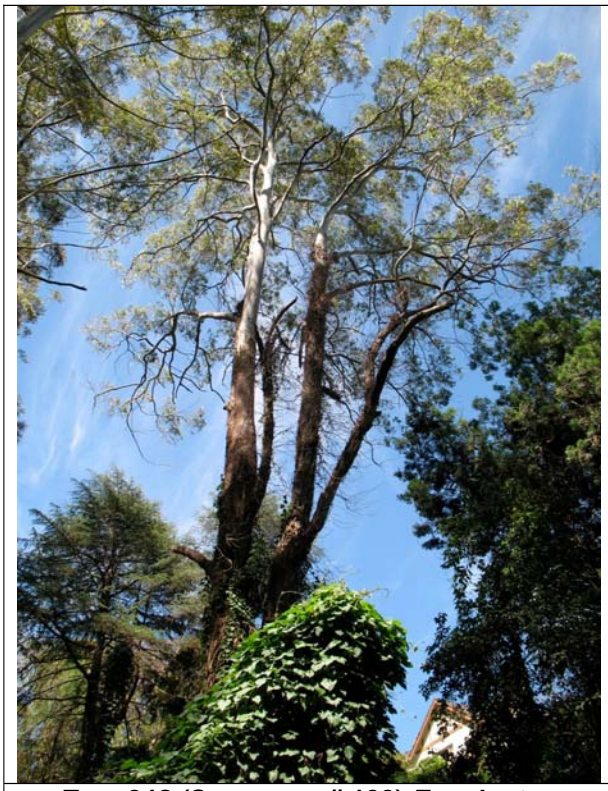
**Tree 13 (Surveyors #175) *Eucalyptus saligna***



**Tree 14 (surveyors # 180) *Eucalyptus saligna***

**Tree A104 (surveyors # 136) *Acmena smithii***

**Tree 91? (surveyors Tree 182) *Eucalyptus saligna***

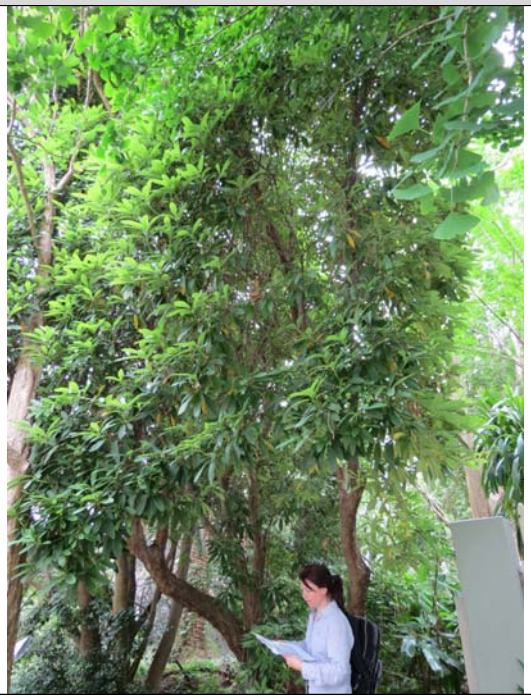


**Tree 24? (Surveyors # 188) *Eucalyptus saligna***

**Tree105 (surveyors #203) *Eucalyptus saligna***

**Tree 58 (Surveyors #209) *Eucalyptus saligna***

**Appendix 3c. Additional trees surveyed on the Pymble Site by Anne Baumann and Dan Clarke (with Richard and John Higgins) on 22 November 2012, with photographs of previously surveyed trees.**

| Tree No. and species | Photograph |
|---|---|
| **Tree 308 – *Gordonia axillaris* along Avon Road** |  |
| | |
| **Trees 309 *Phoenix canariensis*, 310 *Syagrus romanzoffiana* and 311 *Gordonia axillaris*** |  |

| Tree No. and species | Photograph |
|---|---|
| **New Tree 333 *Camellia sasanqua* along Avon Road** |  |
| | |
| **New Tree 334 *Michelia figo* along Avon Road** |  |

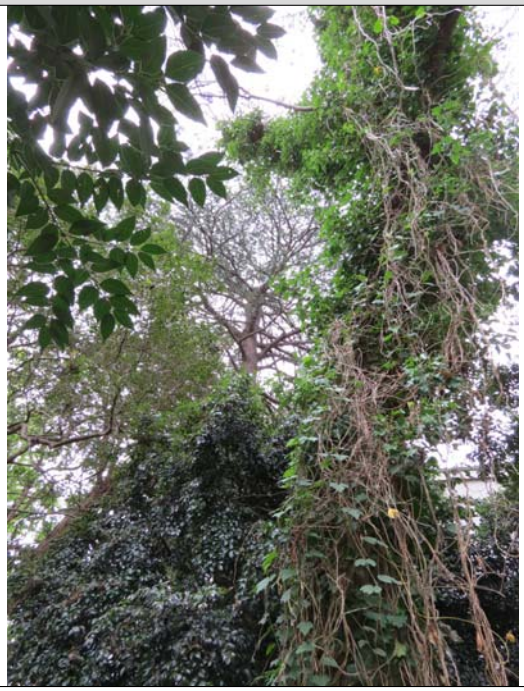
| Tree No. and species | Photograph |
|---|---|
| **New Tree 335 – *Nyssa sylvatica* – along Avon Road** |  |
| | |
| **Tree 329 - *Camellia sasanqua* with new tree 336 to left – *Camellia sasanqua* (along Avon Road)** |  |

| Tree No. and species | Photograph |
|---|---|
| **New Tree 337** ***Acmena smithii*** **(along Avon Road)** |  |
| | |
| **Tree 330 is dead** |  |

| Tree No. and species | Photograph |
|---|---|
| **New Tree 338 – *Ulmus parviflorus* Near derelict house on Avon Road** |  |
| | |
| **New Tree 339 – *Jacaranda mimosifolia* next to derelict house on Avon Road** |  |

| Tree No. and species | Photograph |
|---|---|
| **New Tree 340 – *Jacaranda mimosifolia*** |  |
| | |
| **New Tree 341 – *Acer buergerianum* along fenceline of No. 3 Avon Road** |  |

| Tree No. and species | Photograph |
|---|---|
| **New Tree 342 – *Camellia sasanqua* along fenceline of No. 3 Avon Road** |  |
| | |
| **Tree 268 – *Afrocarpus falcatus*.**<br><br>**Next to house.**<br><br>**Note: A very attractive tree in terms of appearance and structure, commonly grown to large size in botanic gardens and parks.** |  |

| Tree No. and species | Photograph |
|---|---|
| **Tree 318 – *Cedrus deodara* at rear of No. 3 Avon Road – (centre of picture)** |  |
| | |
| **Trees 264-267 – *Syncarpia glomulifera* – native trees and likely remnant. On property of No. 3 Avon Road. 20 m tall approx.** |  |

| Tree No. and species | Photograph |
|---|---|
| **New Tree 343 (Ax) – *Eucalyptus saligna* – remnant** |  |
| | |
| **Tree 102 – *Eucalyptus saligna*** |  |
| | |

| Tree No. and species | Photograph |
|---|---|
| **New Tree 331 – *Angophora floribunda,* near Tree 102** |  |
| | |
| **New Tree 332 – *Eucalyptus saligna* near Tree 102** |  |

## Appendix 4. Ku-ring-gai Council Tree Preservation Order

# KU–RING–GAI COUNCIL
# Tree Preservation Order

## Introduction

This Tree Preservation Order, made under the provisions of the Environmental Planning and Assessment Act 1979, establishes a framework for the submission and assessment of applications for tree works in Ku-ring-gai, to ensure the proper management, replenishment, and long term survival of Ku-ring-gai's tree resource both native and exotic. The order defines Council's responsibilities and requirements with respect to the protection, retention and replacement of trees in Ku-ring-gai.

## On what legislative basis has this Order been made?

*This order is made pursuant to section 26(e) of the Environmental Planning and Assessment Act 1979, and in accordance with Clause 42(4) of the Ku-ring-gai Planning Scheme Ordinance. This Tree Preservation Order was adopted by Council resolution of 12 December 2006, and advertised in the Government Gazette of 25 January 2007.*

## Aims of the Order

*To manage Ku-ring-gai's tree resources in a sustainable manner.*
*To protect, and enhance biodiversity values and identify replenishment opportunities.*
*To recognise, protect and enhance aesthetic and heritage values.*
*To secure and maintain amenity.*
*To sustain and enhance the tree canopy.*
*To prohibit unnecessary injury or destruction of trees.*
*To encourage responsible management of trees within an urban environment*

## To what land does this Tree Preservation Order apply?

*This order applies to the whole of the local government area of Ku-ring-gai with the exception of those lands dedicated as National Park.*

## What is a tree under this Order?

*A Tree under this Order means a plant with any one or all of the following criteria: A perennial plant with at least one self supporting woody, fibrous stem, whether native or exotic, which is 5 metres or more in height or has a trunk diameter of 150mm or more measured at ground level.*

## What tree works are prohibited?

*This Order prohibits the injury of any tree protected under this Order without the written consent of Council. Injury under this Order means damage to a tree and includes:*
*removal of a tree*
*pruning, damaging/tearing of live branches lopping (height reduction) topping of a tree poisoning, including but not limited to, the application of substances damaging to trees such as herbicides, other chemicals toxic to trees, spilling and/or directing contaminants such as oil, petroleum, paint, cement and similar to the root zone.*

## What tree works are prohibited contd.

*Ringbarking, or otherwise damaging the bark including the attachment of objects using invasive fastenings, tree climbing spikes, and the fastening of materials around the trunk of trees which may result in a detrimental impact on tree health.*
*The growing of vines to the trunk and branches of trees which is or will result in a detrimental impact on tree health.*
*Damaging the root zone of a tree by way of compaction, including storage and stockpiling of materials,*
*Changes to ground levels within the root zone of a tree by way of excavation, trenching, or filling.*

## When is Council's consent required?

*Consent from Council will be required to undertake works to trees protected under this Order.*

## What is an offence under this Order?

*A person who contravenes or causes or permits to be contravened the provisions of this order shall be guilty of an offence.*

## What are the penalties for an offence under this Order?

*A person who contravenes the provisions of this order will be liable to prosecution and penalties in accordance with the Environmental Planning and Assessment Act, 1979.*

## When is Council's consent not required?

*Works that do not require consent are called exemptions. The following exemptions to the order apply:*

### 1. Dead trees and branches

*Removal of completely dead trees and dead branches.*

### 2. Tree branches directly over roof lines

*Removal of tree branches which directly overhang the roof of a residence or commercial building, may be pruned back to the nearest branch junction or collar to clear the roofline, provided the owner of the tree is in agreement. Pruning must be consistent with the relevant Australian Standard for Pruning of Amenity Trees, and must not result in a detrimental impact to the future health or stability of the tree or compromise the form of the tree. Detached Garages, all carports and ancillary buildings are not included in this exemption.*

### 3. Trees within 3.0 metres of an existing dwelling.

*Removal of trees within 3.0m of an approved, existing residential building. This distance is measured from the centre of the trunk of the tree at ground level to the external wall of the building. The trunk of the tree must be located on the same property. Verandas, all carports, detached garages, and ancillary buildings, cantilevered and pier supported structures such as balconies and decks are not included within this exemption.*

### 4. Branches and trees near electrical wires.

*Works consistent with the provisions of section 48 of the Electricity Supply Act 1995. For electrical service lines to properties, this would apply to branches within 0.5m of these lines. This exemption applies to tree branches not trunks.*

## 5. Trees on Council land

*Tree works undertaken by Council or Council's authorised agents, on Council owned land, providing these works are consistent with Council's policies and internal guidelines. The removal or trimming of trees in accordance with the Roads Act 1993, when undertaken by Council or Council's authorised agents, Council owned or managed parks or bushland, providing these works are consistent with Council's policies and internal guidelines.*

## 6. Trees approved for removal under development consent

*Trees works for which consent has been granted in accordance with a valid development consent upon release of a Construction Certificate.*

## 7. Minor Pruning

*Pruning of trees where:*

*i) Branches pruned are not more than 50mm in diameter*

*ii) Roots pruned are not more than 30mm in diameter*

*iii) Pruning is consistent with the Australian Standard for Pruning of Amenity Trees (AS 4373-2007)*

## 8. Exempt tree species

*All of the following species are exempt:*
*Acacia saligna,Golden Wreath Wattle*
*Acer negundo, Box Elder*
*Ailanthus altissima, Tree of Heaven*
*Alnus jorullensis, Evergreen Alder*
*Cinnamomum camphora, Camphor Laurel except where 15m in height or greater,*
*Celtis sp.Celtis, Nettle tree*
*Aracastrum romanzoffianum, Cocos Palm*
*Eriobotrya japonica, Loquat*
*Erythrina x sykesii, Coral Tree*
*Erythrina crista – galli, Cockscomb Coral Tree*
*Ficus elastica, Rubber Tree*
*Ligustrum species, Small and large Leaved Privet*
*Liquidambar styracifolia, Liquidambar (with a height less than 12m)*
*Olea europa subsp." Africana", African Olive*
*Populous nigra italica, Lombardy Poplar*
*Robinia pseudoacacia, Black Locust*
*Salix sp, Willows*
*Schefflera sp, Umbrella Tree*
*Toxiocodendron succedaneum, Rhus*
*Other tree species listed from time to time in Council's Weed Management Policy as Urban Environmental Weeds.*
*Other tree species listed from time to time as noxious for Ku-ring-gai under the Noxious Weeds Act (1993).*

## 9. Rural Fires Act 1997

*Tree works for which an order or permit has been issued under the Rural Fires Act 1997.*

## Do the exemptions apply on heritage properties?

*The exemptions under this order do not apply to trees which are or form part of a heritage item.*

## Who can apply?

*Only the owner of the trunk of the tree or their authorised agent (proof of authority required) can apply for consent for tree works under this order.*

## How do I apply?

*An application is required to be completed and forwarded to Council for all works on trees where an exemption does not apply. The application must be accompanied by the prescribed fee.*

## Can the permit lapse?

*The Tree works permit is valid for 12months from the date of issue unless otherwise specified. Upon application Council may allow an extension of time.*

## Can I appeal Council's decision?

*An application for review of Council's decision, under section 82A of the EP&A Act, may be lodged with Council on Council's Tree Review Application form where Council has refused an application , or an appeal may be lodged with the Land & Environment Court of NSW.*

## Will Council require replacement trees?

*Council will require the planting of replacement trees and may specify the number, species, location and stock size.*

## For Further Information

- Tree assessment Guidelines
- Tree Replenishment Guidelines
- Advice on Choosing an Arborist
- Guidelines for Arborist Reports
- Weed Management Policy

See www.kmc.nsw.gov.au or phone 94240888

**Appendix 5. Comparison with the Final Determination for Blue Gum High Forest in the Sydney Basin Bioregion, a critically endangered ecological community listing**

The Scientific Committee, established by the Threatened Species Conservation Act 1995, has made a Final Determination to list the Blue Gum High Forest in the Sydney Basin Bioregion, as a critically endangered ecological community in Part 2 of Schedule 1A of the Act, and as a consequence omit reference to the Blue Gum High Forest in Part 3 of Schedule 1 of the Act. Listing of critically endangered ecological communities is provided for by Part 2 of the Act.
The Scientific Committee has found that:

1. Blue Gum High Forest in the Sydney Basin Bioregion is the name given to the ecological community characterised by the species assemblage listed in paragraph 2. All sites are within the Sydney Basin Bioregion.

Pymble is within the Sydney Basin Bioregion.

2. Blue Gum High Forest in the Sydney Basin Bioregion is characterised by the following assemblage of species [listed on website: http://www.environment.nsw.gov.au/determinations/BlueGumHighForestEndSpListing, accessed 7 July 2012]

Of the 53 listed characteristic species, a total of nine were recorded in the supplementary survey, as well as listed by Aquila Environmental Survey (2009), namely:

| Botname | Recorded in supplementary survey | Listed in Aquila (2009) | Characteristic species recorded |
|---|---|---|---|
| *Acmena smithii* | X | | Yes |
| *Adiantum formosum* | X | X | - |
| *Adiantum hispidulum* | X | | - |
| *Angophora costata* | | X | Yes |
| *Calochlaena dubia* | | X | Yes |
| *Christella dentata* | X | X | - |
| *Cyathea australis* | X | X | - |
| *Cyathea cooperi* | X | X | - |
| *Cyperus imbecillis* | X | | - |
| *Dichondra repens* | X | | - |
| *Doodia aspera* | X | | Yes |
| *Elaeocarpus reticulatus* | X | | Yes |
| *Eucalyptus saligna* | X | | Yes |
| *Eucalyptus pilularis* | | X | Yes |
| *Ficus rubiginosa* | X | | - |
| *Microlaena stipoides* | X | | - |
| *Microsorum pustulatum* | X | | - |
| *Oplismenus aemulus* | X | | Yes |
| *Pittosporum undulatum* | X | | Yes |
| *Pteris tremula* | X | | - |

3. The total species list of the community is considerably larger than that given above, with many species present in only one or two sites or in low abundance. The species composition of a site will be influenced by the size of the site, recent rainfall or drought condition and by its disturbance (including fire) history. The number of species, and the above ground relative abundance of species will change with time since fire, and may also change in response to changes in fire regime (including changes in fire frequency). At any one time, above ground individuals of some species may be absent, but the species may be represented below ground in the soil seed banks or as dormant structures such as bulbs, corms, rhizomes, rootstocks or lignotubers. The list of species given above is of vascular plant species; the community also includes micro-organisms, fungi, cryptogamic plants and a diverse fauna, both vertebrate and invertebrate. These components of the community are poorly documented.

Given the extent of weed cover on the Site, the native component may still persist in the soil seed bank. Hence the number of species may be considerably larger than that recorded, if the weed competition were to be reduced.

4. Blue Gum High Forest is dominated by a tall canopy of eucalypts that may exceed 30 m in height.

There was a tall canopy of eucalypts in excess of 30 m in height, recorded in the gully and to the west.

Its understorey is typically multi-layered with a midstorey of mesophyllous shrubs and small trees and a diverse ground layer of herbs, ferns and some grasses. Most stands of the community are in a state of regrowth after past clearing or logging activities, and consequently trees may be shorter, less dense or more dense than less disturbed stands.

The recorded understorey was dominated by weeds with an almost complete absence of native understorey species, except for a small number of ferns in the gully.

Blue Gum High Forest is dominated by either *Eucalyptus pilularis* (Blackbutt) or *E. saligna* (Sydney Blue Gum). *Angophora costata* (Smooth-barked Apple) is frequently observed in remnants close to the shale/sandstone boundary, but also occurs infrequently on deep shale soils, as does *A. floribunda* (Rough-barked Apple). *Eucalyptus paniculata* (Grey Ironbark) is typically found on upper slopes.

The vegetation in the gully and to the west had a canopy dominated by *Eucalyptus saligna* (Sydney Blue Gum) and one *Eucalyptus pilaris* recorded in the tree survey (Urban Tree Management 2009). *Angophora costata* and *A. floribunda* were not recorded by Urban Tree Management 2009.

A relatively diverse stratum of small trees is usually present, and includes *Pittosporum undulatum* (Sweet Pittosporum)*, Elaeocarpus reticulatus* (Blueberry Ash) and *Allocasuarina torulosa* (Forest Oak).

One *Pittosporum undulatum* was recorded in the tree survey (Urban Tree Management 2009). *P. undulatum* was also recorded in Quadrat 1 of Transect 1 in the supplementary flora survey.

Shrub species are typically mesophyllous, such as *Breynia oblongifolia* (Coffee Bush), *Pittosporum revolutum,* (Yellow Pittosporum), *Clerodendrum tomentosum, Notelaea longifolia* forma *longifolia* (Large Mock-olive), *Maytenus sylvestris* (Narrow-leaved Orange Bark), *Polyscias sambucifolia* subsp. A (Elderberry Panax) and *Rapanea variabilis* (Muttonwood). Mesophyllous species are generally more common in gullies associated with both shale and volcanic soils than slopes and ridgetops. Sclerophyllous species such as *Persoonia linearis* (Narrow-leaved Geebung) and *Leucopogon juniperinum* (Prickly Bearded-heath) occur more frequently closer to the shale/sandstone boundary.

Of the listed shrub species, none were recorded.

The ground stratum is often dense and contains a mixture of herb, grass and fern species including *Adiantum aethiopicum, Entolasia marginata* (Bordered Panic), *Lomandra longifolia* (Spiny-headed Matrush)*, Calochlaena dubia* (Common Groundfern), *Dianella caerulea* (Blue Flax Lily), *Pseuderanthemum variabile* (Pastel Flower) and *Oplismenus imbecillis*. Vine species are also frequently present, in particular *Tylophora barbata* (Bearded Tylophora), *Eustrephus latifolia,* (Wombat Berry), *Clematis aristata* (Old Man's Beard) and *Pandorea pandorana* (Wonga Wonga Vine).

Of the listed ground stratum species, the fern *Calochlaena dubia* was recorded by Aquila Ecological Surveys (2009).

5. While no systematic fauna surveys have been carried out across the range of Blue Gum High Forest a number of mammal and bird species listed as threatened in NSW have been recorded as resident or transient in the community. These include the Grey-headed Flying Fox (*Pteropus poliocephalus*), Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*), Glossy Black cockatoo (*Calyptorhynchus lathami*) and the Powerful Owl (*Ninox strenua*).

No additional comment.

6. Blue Gum High Forest is typically associated with soils derived from Wianamatta Shale (Tozer 2003), though may occur in adjacent areas underlain by Hawkesbury Sandstone. The community also occurs on soils associated with localised volcanic intrusions, 'diatremes' (Benson and Howell 1994).

The geology of the Site was mapped at a scale of 1:100 000 by Herbert and West (1983), with the major part of the Site as Ashfield Shale of the Wianamatta Group, with the downslope southern section mapped as Hawkesbury Sandstone.

Typically, Blue Gum High Forest occurs more than 100m above sea level, where rainfall exceeds 1050 mm per annum, although it may be present in sheltered locations with lower rainfall (Tozer 2003). In drier areas and approaching the shale/sandstone boundary, it intergrades with Sydney Turpentine Ironbark Forest, which is currently listed as an Endangered Ecological Community under the TSC Act. Stands that exhibit intermediate characteristics are collectively covered by the Determinations of these communities and may be diagnosed by detailed consideration of the assemblage of species present at the site.

The elevation of the Site is about 120 m to 150 m AHD, and therefore, occurs more than 100 m above sea level.

The recorded annual rainfall at the nearby meteorological station at Gordon Golf Club exceeds 1050 mm.

7. Vegetation surveys carried out across the range of Blue Gum High Forest include those of Benson and Howell (1990, 1994) and Tozer (2003). All of these studies describe and map this community as 'Blue Gum High Forest', including map unit 6b 'Tall open-forest: *Eucalyptus pilularis* - *Eucalyptus saligna*' of Benson and Howell (1994) and map unit 153 of Tozer (2003). In addition, Benson and Howell (1994) map separately that part of this community which occurs on soils associated with diatremes as 'Glen Forest, map unit 6c, i. Tall open-forest: *Eucalyptus saligna*', noting that this vegetation was 'very similar to the Blue Gum High Forest of the north shore [i. e. map unit 6b]'. Blue Gum High Forest belongs to the North Coast Wet Sclerophyll Forests vegetation class of Keith (2004).

A small section of the site was mapped as Blue Gum High Forest Condition Class A by NPWS 2002/Tozer (2003).

8. Blue Gum High Forest is found on the north shore and northern suburbs of Sydney and has been recorded from the local government areas of Lane Cove, Willoughby, Ku-ring-gai, Hornsby, Baulkham Hills, Ryde and Parramatta within the Sydney Basin Bioregion and may occur elsewhere in the Bioregion.

The site is located in the Ku-ring-gai local government area.

9. Blue Gum High Forest has a very highly restricted geographic distribution, and is currently estimated to cover an extant area of less than 200 ha (Tozer 2003). The distribution comprises a series of small remnant patches, the largest of which is less than 20ha. Highly modified relics of the community also persist as small clumps of trees without a native understorey. All remnants of the community are now surrounded by urban development. Consequently, the distribution of Blue Gum High Forest is severely fragmented. Fragmentation of habitat contributes to a very large reduction in the ecological function of the community.

There were 46 *Eucalyptus saligna* recorded in the gully and to the west without a native understorey. The patch is surrounded by urban development.

10. Prior to European settlement, about 200 years ago, Blue Gum High Forest is estimated to have covered an area of approximately 3700 ha (Tozer 2003). Its current extent amounts to less than 5% of this original distribution. The dominant eucalypts of the community live for several hundred years. Blue Gum High Forest has therefore undergone a very large reduction in its geographic distribution within a time span appropriate to the life cycle and habitat characteristics of its component species. Small-scale clearing associated with residential subdivision, road upgrading, extension and maintenance of service easements, etc. pose a threat of ongoing decline in the extent of the community. Clearing of native vegetation is listed as a Key Threatening Process under the Threatened Species Conservation Act 1995.

No additional comments.

11. Changes in structure of Blue Gum High Forest have occurred as a consequence of the extensive removal of large old trees. A number of stands of Blue Gum Forests have highly modified understories, in which the native woody component has been largely replaced by woody exotic species or by increased abundance of native and exotic grasses. Continued underscrubbing, frequent burning and mowing may

maintain the understorey in an artificially open state and prevent recruitment of species with the community. The loss of large trees removes essential habitat for a range of tree-dependent fauna (Gibbons and Lindenmeyer 1996). The reduction of understorey complexity, through the reduction of native shrub cover, degrades habitat for a range of bird and mammal species (Catling 1991). These processes contribute to a very large reduction in the ecological function of the community.

On the site, the native woody understorey component has been almost completely replaced by woody exotic species.

12. The influx of stormwater, which brings excessive moisture, pollutants and nutrients to the remnant forests from surrounding urban areas, is a significant ongoing threat to the ecological integrity of Blue Gum High Forest. This, together with the legacy of past disturbances and the abundance and dispersal of weed propagules from nearby urban areas, results in the invasion, establishment and spread of weeds (Thomson and Leishman 2005). Problematic weed species in Blue Gum High Forest include the following [listed on website: http://www.environment.nsw.gov.au/determinations/BlueGumHighForestEndSpListing, accessed 7 July 2012]:

Of the 12 listed weed species, seven were recorded (*Asparagus asparagoides, Cinnamomum camphora, Lantana camara, Ligustrum lucidum, Ligustrum sinense Ochna serrulata* and *Tradescantia fluminensis*).

'Invasion and establishment of exotic vines and scramblers', 'Invasion of native plant communities by exotic perennial grasses' and 'Invasion, establishment and spread of Lantana (*Lantana camara* L. *sens. lat*)' are listed as Key Threatening Processes under the Threatened Species Conservation Act. The influx of stormwater, pollutants and nutrients, and the invasion of weeds contribute to a very large reduction in the ecological function of the community.

The creeper *Ipomoea indica* and the shrub *Lantana camara* smothered most of the vegetation in the gully and to the west.

13. Blue Gum High Forest in the Sydney Basin Bioregion is eligible to be listed as a critically endangered ecological community as, in the opinion of the Scientific Committee, it is facing an extremely high risk of extinction in New South Wales in the immediate future, as determined in accordance with the following criteria as prescribed by the Threatened Species Conservation Regulation 2002:

**Clause 25**
The ecological community has undergone, is observed, estimated, inferred or reasonably suspected to have undergone, or is likely to undergo within a time span appropriate to the life cycle and habitat characteristics of its component species:
(a) a very large reduction in geographic distribution.

**Clause 26**
The ecological community's geographic distribution is estimated or inferred to be:
(b) very highly restricted,
and the nature of its distribution makes it likely that the action of a threatening process could cause it to decline or degrade in extent or ecological function over a time span appropriate to the life cycle and habitat characteristics of the ecological community's component species.

**Clause 27**
The ecological community has undergone, is observed, estimated, inferred or reasonably suspected to have undergone, or is likely to undergo within a time span appropriate to the life cycle and habitat characteristics of its component species:
(a) a very large reduction in ecological function,
as indicated by any of the following:
(b) change in community structure
(c) change in species composition
(f) disruption of ecological processes
(g) invasion and establishment of exotic species
(h) degradation of habitat
(i) fragmentation of habitat

No additional comment.

**In conclusion**, the vegetation of the gully and to the west, meet the criteria for the listed critical endangered ecological community *Blue Gum High Forest in the Sydney Basin Bioregion*. The vegetation is highly modified relics of the community, persisting as small clumps of trees without a native understorey.

## Appendix 6. NSW National Parks and Wildlife Services (1999) – General Guidelines for Environmental Management Plans

**NSW NATIONAL PARKS AND WILDLIFE SERVICE**

# GENERAL GUIDELINES FOR ENVIRONMENTAL MANAGEMENT PLANS

An Environmental Management Plan (EMP) is designed to provide a framework for the management of environmental issues throughout the lifetime of a consent for development, and usually provides for management:

- during all construction stage/s;
- during the lifetime of the operation; and,
- following completion of the operation.

The specific issues addressed in an EMP will vary from site to site and depend significantly upon the consents or approvals issued. These guidelines set out some principles to be considered when preparing EMPs for the management, rehabilitation and conservation of:

- areas of native vegetation;
- habitat for native flora and fauna, including threatened species; and
- Aboriginal sites and places, including both known and potential archaeological sites and areas of cultural heritage significance.

It is considered that the establishment of an EMP will assist the proponent and/or site manager to:

- clearly identify and plan for areas of conservation significance;
- synthesise planning, management and operational constraints;
- identify objectives, strategies and actions required to provide appropriate management of areas of conservation significance;
- identify contingency and monitoring mechanisms, and responsibilities for implementation, to ensure that the objectives are being achieved; and
- assist in meeting the requirements of the *Environmental Planning and Assessment Act 1979 (EP&A Act), National Parks and Wildlife Act 1974 (NP&W Act), Threatened Species Conservation Act 1995 (TSC Act), Rural Fires Act and Native Vegetation Conservation Act 1997.*

## Part 1 - The Structure of the Environmental Management Plan

Broadly, the EMP would include the following sections:

- ***Land status and management*** - identifies the tenure of the site (such as private or Crown land) and the land manager (eg. a government agency, private individual or a company).
- ***Planning Framework*** - identifies those existing planning requirements which form the basis of the EMP, including relevant provisions of:
  - Local (LEPs) and Regional (REPs) Environmental Plans;
  - State Environmental Planning Policies (SEPPs);
  - Regional Vegetation Management Plans (RVMPs);
  - Fire Management Plans;
  - Catchment Management Plans;
  - Conservation Plans for cultural heritage;
  - Plans of Management under the NPW Act;
  - other Environmental Management Plans;
  - relevant policies such as the NSW Biodiversity Strategy and Coastal Policy;
  - Recovery Plans and Threat Abatement Plans; and,
  - Species Impact Statements (as described further below).
- ***Objectives*** - clearly identifies the desired outcomes of the EMP, including those outcomes required by the consent/s and/or approval/s for the site.
- ***Strategies*** - establishes a framework for meeting the objectives of the EMP.
- ***Actions*** - the work plan, including details of how, where and by when work is to be carried out.
- ***Monitoring*** - details any monitoring programs to be carried out, and establishes assessment criteria and target achievements.
- ***Contact protocols*** - outlining procedures and any notifications to be given before works commence, together with contact details for the site or project manager (including emergency contact details).
- ***Contingency Plans*** - identifies actions to be taken should monitoring identify that objectives are not being met, or in the event that unusual circumstances arise (such as new threatened species being revealed, further Aboriginal relics being located or wildfire occurring).

### Specific Contents of EMPs

To be an effective and useful document for site management, the EMP should include the following minimum information:

- map(s) placing the proposal in a regional and local setting;
- descriptions of the various operational activities that relate to the objectives of the EMP;
- detailed site maps illustrating:
  a) the distribution of pre-activity vegetation and Aboriginal heritage and identifying how that is to be altered by the proposal; and,
  b) areas of conservation significance;

c) the proximity of all proposed activities in relation to areas of conservation significance;
d) areas designated for rehabilitation, site conservation work or to be set aside for conservation purposes;

- detailed descriptions of the vegetation communities and any known threatened flora species in the study area;
- detailed description of the significant fauna species within the study area;
- identification and maps of the locations of essential habitat for any threatened species, populations or ecological communities;
- mapping of the location of all Aboriginal sites (including known and potential archaeological sites and areas of cultural heritage significance) within the study area and an assessment of the cultural significance of these;
- identification of habitat corridors and linkages between areas of remnant native vegetation which may assist faunal movement through the area;
- identification of any buffer areas; and,
- may also contain one or more aerial photographs of the site.

**Other plans or reports, including Species Impact Statements, Recovery Plans and Threat Abatement Plans**

The EMP should have regard to other plans including any Species Impact Statements (SISs), Recovery Plans (RPs) and/or Threat Abatement Plans (TAPs) that are relevant to the site.

These documents include specific management requirements for:

- threatened species, populations, and ecological communities, and their habitats;
- critical habitat; and,
- key threatening processes.

Unlike most other tiers of the planning framework, these documents provide specific and detailed requirements for the management and conservation of threatened species matters.

**Aboriginal heritage and community consultation**

Measures for the management and conservation of sites or areas of Aboriginal heritage significance in an EMP should be developed in direct consultation with the local Aboriginal community, including any Local Aboriginal Land Councils, known Tribal Elders Corporations and Native Title claimants. The advice of independent anthropologists or archaeologists may be sought to provide specialist input. To obtain a list of Land Councils or Native Title claimants contact:

**NSW State Aboriginal Land Council**
PO Box W125
PARRAMATTA NSW 2150
Ph: (02) 9689 4444

**Department of Aboriginal Affairs**
Level 5, 83 Clarence Street
SYDNEY NSW 2000
Ph: (02) 9290 8700

Note that many developments may also require a consent to damage or destroy an Aboriginal relic or Aboriginal place from the Director-General of the NPWS under s.90 of the NP&W Act. In most cases, decisions on whether to grant a s.90 consent for a particular proposal are now considered as part of an integrated development application under the EP & A Act. The NPWS has separate guidelines that further explain the integrated development assessment process as it relates to Aboriginal sites and places.

The form of the protection/management of a site of natural or cultural heritage significance may include any of, but is not limited to, the following:

- either total or partial exclusion of works on or access to some or all areas;
- exclusion of specified activities from some or all areas;
- permanent or temporary (e.g. during construction) fencing;
- collection of "relics" (maybe linked to subsequent restoration);
- site conservation works (eg. erosion control, graffiti removal, etc);
- regular monitoring by the Aboriginal community;
- participation of Aboriginal community representatives during some stages of the process or specified activities;
- detailed recording of sites (including art, etc), followed by regular monitoring; and/or
- site interpretation.

## Part 2 - Management Issues

The following sections outline the issues associated with specific management requirements, some or all of which may apply to an EMP to varying degrees.

- ***Fire Regimes***

The existing fire regime of an area is a key factor in determining ecological systems and functions. In particular, the impact of fire on species composition (diversity and relative abundances) can be highly significant.

There are a range of legal requirements and guidelines related to planning for bush fires that must also be considered in drawing together an EMP for fire management, such as the provisions of the Rural Fires Act 1997 and Australian safety standards associated with fire radiation zones around buildings and other structures.

Management of fire regimes therefore requires consideration of: fire radiation zones; fire trails; fuel loads; frequency of burns; intensity of burns; and, both ecological components and ecological processes. For example: some species of flora require periodic burning to stimulate growth; some fauna are particularly susceptible to hot fires (e.g. the koala); fires usually cause successional shifts, altering the species composition and relative abundances of native vegetation in particular; fires can remove protective cover for native species; and, weed invasion can often follow in the wake of fires.

The EMP should clearly: establish the human and ecological constraints on fire management; establish a burning program; specify environmental conditions that should be considered at the time of burning; and, clearly identify any approvals that will be required.

Examples of possible provisions:

- fire radiation zones of 20m around all buildings;
- fire trails to be no more than 4m wide;
- only low-temperature or high-temperature burns to be attempted;
- Conservation Area No.6 to be burnt every 2 years with higher temperature burn;
- habitat of known threatened species to be protected from burning (this is dependent on the ecological requirements of particular species and communities); and
- protection of Aboriginal sites vulnerable to intense fire.

- ***Hydrological Regimes and Erosion***

The systems that regulate the flow of water though a site, including both surface and groundwaters, can be significantly altered during site development and as a result of subsequent site use. The most obvious of these changes include altered surface flow patterns resulting from construction of dams, modification of streams, increased paved areas, and altered drainage patterns.

Modification of these processes can affect threatened species and Aboriginal sites by either reducing or increasing water flows to any given area. The EMP can be required to provide systems for the management of hydrological processes where they may affect such values.

Ensuring that water regimes through areas of conservation significance remain unaltered may be a fundamental component of the EMP.

Examples of possible provisions:

- prevention of stormwater entering identified conservation areas;
- low-water contingencies during drought conditions;
- maintaining 'net' movement of water through the site;
- appropriate on-site water quality controls;
- monitoring systems.

- ***Landscape Systems***

Management of landscapes is particularly relevant where the threatened species or Aboriginal heritage values of the site are not discrete. In particular, Aboriginal heritage areas and ecological communities may require landscape management approaches in order to adequately provide for conservation.

Large areas of a property may be designated for conservation purposes with a combination of active and/or passive management techniques for that area. In a well planned site, a range of different conservation values may be captured in a single conservation area. This form of site management is encouraged as it is more effective than smaller site-by-site management techniques, however, more discrete techniques are necessary and appropriate in some cases. Landscape management will also require careful consideration of conservation principles such as connectivity and edge-to-area ratio.

Examples of possible provisions:

- prevention of grazing through some areas;
- grazing by soft-footed species only (e.g. kangaroos, camels etc);
- weed management to be carried out through that area to prevent spread of bitou bush;
- revegetation with shallow rooted plants only in Aboriginal midden or burial areas.

- ***Soil and Geological Features***

Maintenance of the soil and geological resources of a site is essential to maintain many of the ecological processes at work. Such resources are also often a key source of Aboriginal archaeological evidence.

Whilst loss of soil surfaces is considered by a consent authority in assessing a development proposal and issuing consent, the continued protection of exposed soil surfaces is also an issue for the EMP. This is particularly the case during construction stages and clearing activities when unsupported soil can become exposed to erosive forces.

The geological character and special features of a site can be equally important, particularly as a record of Aboriginal heritage and in providing specific habitat requirements for some flora and fauna species.

An EMP must provide for management of soil resources during construction stages, using appropriate erosion control techniques, and following construction, usually through revegetation programs.

Some areas may be fenced and protected, such as rock outcrops or specific patches of soil. Translocation is rarely a solution in managing these resources.

Landscaping and other techniques may also be needed following the completion of work.

Examples of possible provisions:

- sediment control traps to prevent flow of top-soil off site;
- fencing a rock outcrop from all use;

- netting/gauze to prevent top soil from being blown away during construction;
- re-establishing a small hill and natural drainage line.

- ***Isolation Factors and Corridors***

The role each part of a site plays as habitat for a species can be markedly affected by the location of appropriate corridors. For example, an isolated sandstone outcrop may be essential habitat for the Broad-headed Snake, but it may also need adjacent tree hollows to nest in, and a way of moving to another outcrop without risk of exposure to predators.

Corridors of vegetation are an example of these transport routes, others including drainage lines (such as creeks) and rocky ridgelines. Ensuring that these corridors provide links between and across the various habitat components of a site is one of the critical issues to be addressed in an EMP.

Whereas some areas may need to be protected for their corridor values, there is scope for revegetation and other forms of habitat restoration to also provide corridor links between habitat patches.

Examples of possible provisions:

- fencing ridgelines, creeklines or treelines;
- revegetation programs;
- prevention of grazing through corridor, except for 2 months of controlled grazing each year;
- active weed control.

- ***Special Habitat Features***

A number of threatened species and other species of conservation concern are habitat specialists. This means that they must have specific habitat features available in order to carry out their normal life-cycle. Examples of these species include the Koala (requires a range of eucalypt species), Glossy Black-Cockatoo (feeds on species of Casuarinacea), Broad-headed Snake (requires rock scales for shelter and tree hollows for nesting) and *Zannichellia palustris L.* (requires freshwater for its entire lifecycle).

As these requirements are usually discrete they are often more readily managed, however special provision may be required in order to achieve conservation of certain aspects of these habitats.

Examples of possible provisions:

- fencing a creekline;
- protection of all Casuarinas on a site;
- preventing removal of ground wood, or selective removal only;
- leaving standing dead trees (stags);

- ensuring water levels of at least 0.4m at specified locations in a dam.

- ***Fauna Movement***

The movement of fauna throughout a site is a separate issue, although it is clearly linked to some of the matters considered above. Fauna require freedom to move within and between habitat areas. The home range (the geographic area used by a species during its lifetime) varies between and within species groups.

There are a range of human-made and natural barriers to fauna movement, and both must be considered. Human-made barriers include buildings, fences, artificial drains, dams, open fields, screens, roads etc. Natural barriers can be rivers, cliffs and chasms. Natural barriers can be as effective as man-made barriers in restricting movement for some species that had previously been used to more freedom of movement in the area of the development.

An EMP should provide for the movement of native species between areas of identified habitat, particularly targeting those species of conservation significance on the site.

There may also be areas of a site where the total exclusion of native fauna is the desired outcome. In these case the barriers used should prevent the transition of even the smallest native animals.

Examples of possible provisions:

- fences that prevent cattle from moving into conservation areas including single strand electric fences or strand fences without mesh;
- climbing poles along all fencelines to allow koalas and other arboreal animals to move across the fenceline;
- slowed traffic conditions, signage and lighting along roads at points of high fauna use;
- fine grade mesh, 2m high electrified fences to prevent movement of feral cats, foxes or dogs into an area supporting fauna of conservation significance;
- clearly labelled signs on all fences indicating that it is a conservation area;
- clearly labelled signs preventing people from entering sensitive areas.

- ***Domestic Animals***

Domestic animals, both stock animals and pets, can have direct and marked affects on sensitive areas. Stock in particular can have devastating effects on stream banks and vegetation cover and in promoting soil compaction, whilst dogs and cats can exert direct predator pressure on native fauna.

On a private site, domestic animals can be excluded or restricted in many ways. Covenants can be used to restrict domestic pet ownership.

Examples of possible provisions:

- complete prohibition against domestic animals on site;
- special rules for dogs and cats, such as curfews;
- fencing to prevent movement of stock into creeklines or other sensitive sites.

- ***Weed and Pest Control***

Weed and pest control are two of the most widely applied requirements of EMPs. The form of, and need for, these requirements are extremely varied and depend upon the species being controlled. Often an approval for a development may be subject to conditions requiring the control of weed or pest problems on a site.

The problems of weed intrusion are usually exacerbated by development, including: increased spread due to areas being cleared; increased intrusion into new areas due to a reduction in ecological integrity; edge effects; movement of domestic stock introducing new weed seeds; and, feed for domestic stock introducing new weed species or seed.

Pest control, including control of feral animals such as dogs, foxes, cats, pigs and goats, as well as 'vermin' such as introduced rats and birds, can be necessary to varying extents depending upon the conservation values of the site. Sensitive ecological communities may require baiting programs, direct removal and/or other techniques for control of introduced or other pest species. Pest and weed control may also be necessary to protect Aboriginal heritage sites, for example to reduce impacts from feral goats, but weed removal either by hand or poison may also damage some sites.

Examples of possible provisions:

- manual, chemical or biological removal of weed species;
- baiting programs for cats and dogs;
- fencing to exclude goats and pigs;
- fencing to exclude cattle, whilst also allowing wombats to move through;
- active revegetation and / or regeneration to exclude weed colonisation.

- ***Overuse - vehicle or pedestrian traffic***

Good site management often requires mechanisms to ensure that sensitive areas are not degraded by overuse. In practice, absolute restriction is often neither feasible or desirable and in many instances a balance can be reached that meets both conservation and access objectives.

However, in some cases restrictions on access are necessary to ensure maximum protection of conservation values. This may include: areas containing habitat for threatened species (such as the Wollemi Pine); areas undergoing regeneration; already degraded areas; or areas not safe for general public access.

In addition, it may be appropriate to restrict access to areas and sites of Aboriginal heritage significance to minimise the risk of degradation or damage and to respect the spiritual or religious beliefs of Aboriginal peoples.

Examples of possible provisions:

- restricting or limiting access to some sites;
- temporary restrictions to allow regeneration;
- walking paths elevated and fenced to protect ground flora and Aboriginal sites;
- monitoring vehicular/pedestrian traffic.

- ***Waste and pollution management***

Waste materials and pollution that may result from the three stages of the lifecycle of a proposal include:

- solid, liquid and gaseous wastes; and,
- noise, odours and light pollution.

The waste products of any proposal are clearly identified as part of the consent process and frequently require ongoing management. EMPs are increasingly being used to manage pollution into water and air, and to manage putrescible and non-putrescible wastes.

Each of these factors can have marked effects on those issues of interest to the NPWS and containment is critical for the general purposes of environmental management and protection. Noise and light are both known to directly impact on habitat use by some fauna, some gaseous wastes inhibit plant growth and development, and odours can reduce the aesthetic value of national parks and other conservation reserves.

The EMP should incorporate specific provisions for the management and disposal of wastes, and the minimisation of pollution to the standards established by the Environment Protection Authority.

Examples of possible provisions:

- transportation and disposal of non-recyclable solid wastes produced during construction at a nearby landfill;
- composting of putrescible wastes;
- recycling of non-putrescible, recyclable waste products;
- screening to prevent light pollution.

- ***Rehabilitation and Restoration***

Rehabilitation or habitat restoration is usually incorporated as a key component of an EMP.

Rehabilitation tends to take the form of vegetation restoration, however it also needs to consider the need to re-establish other habitat components (such as dead logs, bushrock etc) and community processes (particular species may be needed to ensure ecological processes continue). This broader concept of habitat restoration is often a principle adopted by qualified bush regenerators.

The EMP should clearly identify those areas due for rehabilitation, the timing of rehabilitation works and the need for monitoring. Often rehabilitation processes are linked with other management processes such as weed control and landscaping.

All revegetation should use local native species, together with local soil types, which should be planted in abundances that imitate the naturally occurring local communities.

Examples of possible provisions:

- fence an area that is to be rehabilitated throughout the first 3 years of site use;
- replant trees in marked corridor areas at a ratio of 5 for every tree that is removed elsewhere on the site;
- landscape and revegetate a specified area using local endemic native plant species and / or seed sources;
- landscape and revegetate areas progressively as the site is developed.

- ***Ecological Integrity***

Finally, the ecological integrity of the site should be maintained as much as possible. Any development on site will reduce the ecological integrity of the site, however these impacts should be minimised wherever possible.

All of the categories above address individual components of the ecology of the site. However, the EMP has the capacity to draw these components together to provide a tool for comprehensive ecological management and provide opportunities for the conservation of Aboriginal heritage.

Many of the example provisions above can be combined to affect two or more different aspects of the conservation values of the site, and when combined carefully can produce synergistic cumulative effects.

Examples of possible provisions:

- fencing a creekline to restrict cattle, whilst allowing wombats and koala's to move through; using bait to reduce the numbers of foxes; and having a complete restriction on dogs to reduce the threat of koala kills;
- restrictions on the removal of dead or dying timber and Casuarina species; cat-proof fencing to exclude cats and an internal baiting program to remove feral cats from within an area enclosed for regeneration and protection of Glossy Black-Cockatoo;

- electro-fishing to remove predatory fish species, fencing to prevent cattle access and controlled release of water from the weir upstream to maintain habitat for a Green and Golden Bell Frog population;
- controls to minimise stormwater impacts on middens, restrictions on construction works in areas containing rock outcrops, limited pedestrian and vehicle access to specific Aboriginal sites, and opportunities for the local Aboriginal community to visit and interpret sites and monitor works.

**Monitoring**

An essential section of the EMP is the monitoring program. Every section of the EMP should have a list of desired outcomes and times to achieve those outcomes. The monitoring program should be established to measure progress towards those outcomes and modify strategies and actions accordingly if those outcomes are not being met.

Monitoring could include measuring regrowth, water-quality reports, soil testing, seasonal surveying for specified species to ensure continuance and/or increased abundance, and site inspections by representatives of the local Aboriginal community to ensure that relics or sites of Aboriginal heritage value are being maintained.

The employment of environmental officers or other specialists such as bush regenerators should ensure the quality and effectiveness of any management or protection works carried. Their role is especially important in the design and monitoring of ongoing regenerative work.

The results of monitoring are often required to meet consent or approval conditions and should be accurately recorded at all times. The results should also be accurately assessed to ensure that objectives are being met and a clear indication that this has been considered, including any assessment criteria used, well documented.

**Contingency Planning**

Unlike monitoring to achieve stated objectives, contingency plans should be in place in anticipation of the unexpected. Examples of this might include a new threatened species being sighted, breeding locations being found, or a new Aboriginal relic being unearthed during construction of an approved development.

The contingency plans might include immediate actions, such as halting work, seeking advice, seeking clarification on identifications or other options. They may also address longer term planning issues, such as development alternatives should the new 'find' prevent work proceeding.

**Further Information**

From time to time the NPWS produces documents that may assist in the preparation of an EMP, including technical documents on species management, guidelines for conservation planning or guidelines for protection of Aboriginal sites. For further

information concerning these documents, contact the information desk of the NPWS on (02) 9585 6333.

For further information regarding Environmental Management Plans please contact:

Manager, Conservation Planning Unit
Conservation, Programs and Planning Division
Central Directorate
NNSW National Parks and Wildlife Service
P.O. Box 1967
**HURSTVILLE NSW 2220**

Ph - (02) 9585 6674
Fax - (02) 9585 6442

**Appendix 7.**
**The NSW Department of Environment and Climate Change (2008) – Protecting and Restoring Blue Gum High Forest**

# Protecting and restoring Blue Gum High Forest

CMA Sydney Metropolitan Catchment Management Authority

Australian Government

Ku-ring-gai Council

Department of **Environment & Climate Change** NSW

# Contents

# Introduction

As Sydney has developed, much original native vegetation has been cleared or disturbed. As a result, many native plants and animals have become locally extinct, or there are so few of them living in isolated communities that they are threatened with extinction.

The Department of Environment and Climate Change and Sydney Metropolitan Catchment Management Authority are working with local government and the community to protect endangered remnants of native vegetation in Sydney and the threatened species that live in them.

This booklet explains how you can help preserve the critically endangered blue gum high forest. For example, you may go on an educational bushwalk, build a nest box for a native bird or join a bushcare group. This brochure also lets you know about valuable work already occurring to preserve the St Ives blue gum high forest, which is Sydney's largest surviving remnant of blue gum high forest.

You can obtain other threatened species brochures at www.environment.nsw.gov.au/threatenedspecies or contact the Environment Line on 131 555.

Blue gum high forest
*Photo: Alan Kwok*

Powerful owl
*Photo: David Wilks*

# What is blue gum high forest?

Blue gum high forest is a unique community of trees, shrubs, grasses and groundcovers that once covered large areas of the shale-capped ridge-tops of Sydney's northern districts.

It is named after the Sydney blue gum (*Eucalyptus saligna*), just one of the common trees in this type of forest. It is called 'high forest' because the trees in this forest type can grow to a height of over 30 metres and are some of the tallest trees in Australia. Blue gums can measure over 8 metres around the base of their trunks.

Blue gum high forest canopy
*Photo: David Wilks*

## Why is it so important?

Blue gum high forest:

- is a unique assembly of plants, from giant trees to tiny ground orchids and grasses
- provides habitat and shelter for a range of native animals, including the grey-headed flying-fox and glossy black cockatoo, that are listed as threatened in the *Threatened Species Conservation Act 1995*
- is part of the distinctive landscape of the Sydney region, and is not found anywhere else in Australia
- provides a living link to ancient Australia – blue gum high forest acts as a window to the past, revealing the native landscape the local Aboriginal Guringai people and early non-Aboriginal settlers would have seen in the eighteenth century
- contains trees that form hollows large enough to shelter animals such as the threatened powerful owl, parrots, possums and tiny insectivorous bats.

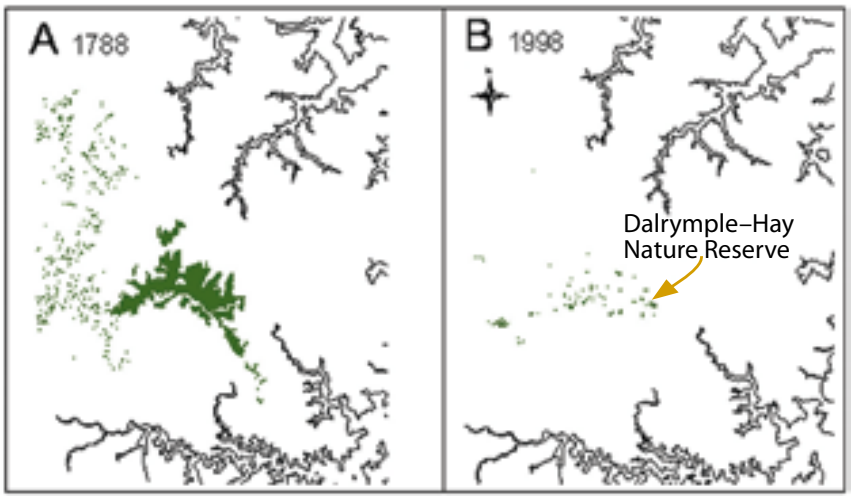
Less than 1% of the total area of this forest type is protected in national parks.

## History of blue gum high forest

The first threat to Sydney's blue gum high forest came from people living in early settlements during the 1800s. Settlers logged tall straight trees, and used the timber to build Sydney Town, including its wharves, bridges, roads and tramlines.

After the tallest trees had been removed, for many years the remaining trees were felled to provide Sydney residents with firewood. Orchards were established on the fertile shale soils from as early as 1826. After the railways were constructed in the 1920s, the remaining forests were felled for the development of suburbs.

Today the invasion of weeds, nutrient-rich stormwater run-off, rubbish dumping, inappropriate fire regimes and mowing of plants are causing the forest to decline further.




Past (A) and present (B) distribution of blue gum high forest.

## Here today, gone tomorrow?

With **less than 5%** of its pre-1788 distribution remaining, blue gum high forest has been listed as a critically endangered ecological community under the NSW *Threatened Species Conservation Act 1995*. Scientific assessments have concluded that blue gum high forest could soon cease to exist unless people act to preserve it.

# St Ives blue gum high forest

## Getting there

Visitors can enjoy the majestic tall blue gums and blackbutts of Dalrymple–Hay Nature Reserve and Browns Forest. Entry is via Mona Vale Road, or the corner of Vista Street and Rosedale Road. There is no public transport to the site.


Ringtail possum
*Photo: Cheyne Ramsay*

St Ives Blue Gum High Forest is the largest surviving remnant of blue gum high forest consisting of approximately 18.3 hectares of land. It is managed by three agencies: Department of Environment and Climate Change (Dalrymple–Hay Nature Reserve and 100 Rosedale Road), Ku-ring-gai Council (Browns Forest and 102 Rosedale Road) and Sydney Water (Sydney Water Reservoir)

Native cherry (*Exocarpus cupressiformis)*
*Photo: Nick Colman*

Grey-headed flying-fox
*Photo: Alan Kwok*

## Plants and animals

There is much to see once you start to stroll through blue gum high forest. The following are a few of the plants and animals that live there.

**Native cherry** (*Exocarpus cupressiformis*)
The native cherry is a 2–6 metre tall tree. When ripe, its fruit has a sweet flavour that was popular with local Aboriginal people and early colonists (Robinson 1994). Aboriginal people used the wood to make spear throwers and bull roarers. Bull roarers were used to announce ceremonies or to ward off evil spirits (Nash 2004).

The native cherry is a parasitic plant. As it taps into the root systems of host plants, no weeds can be poisoned near this tree. Weeds have to be pulled out or cut down and covered with a tin to prevent regrowth.

**Powerful owl** (*Ninox strenua)*
The St Ives blue gum high forest forms part of the habitat of a pair of powerful owls. When they enter the forest, they become the top native predators, preying on ringtail possums. While their call – a slow, deep and resonant double hoot – may be heard in the reserve at any time of year, it is more prevalent during the winter breeding season. Powerful owls face two major threats: destruction of hollow bearing trees used for nesting and habitat fragmentation (Department of Environment and Conservation 2005).

**Sugar glider** (*Petaurus breviceps)*
Sugar gliders prefer mature forests with lots of tree hollows to nest in, such as those found in St Ives blue gum high forest. They are active at night, gliding from tree to tree and feeding on nectar, pollen and the sap of certain eucalypt and wattle trees (Department of Environment and Conservation 2004a). Domestic cats have been reported to be preying on sugar gliders in the forest.

**Grey-headed flying-fox** (*Pteropus poliocephalus*)
The grey-headed flying-fox is Australia's largest bat. When the smooth-barked apple (*Angophora costata*), blackbutt (*Eucalyptus pilularis*) and Sydney blue gum (*Eucalyptus saligna*) come into flower, you can hear the calls of flying-

foxes at night as they feed. Blossoms containing pollen and nectar are their main diet.

Each night flying-foxes can travel up to 50 km to forage on the nectar, pollen and fruits of native trees. Flying-foxes are effective pollinators of fruit-producing trees. By dispersing their seeds, flying-foxes play an essential role in maintaining forest ecosystem health and biodiversity (Department of Environment and Conservation 2005).

**Glossy black cockatoo** (*Calyptorhynchus lathami)*
Glossy black cockatoos can often be seen feeding on seeds extracted from the wooden cones of casuarina and allocasuarina trees in blue gum high forest. The bird uses its bill to remove the tough outer hull while rotating the cone in its left foot. The exposed seeds are then stripped away and eaten.

The art of opening a casuarina cone is apparently learned behaviour, as young birds frequently have trouble manipulating the cones into the correct position (Crome and Shields 1992). Glossy black cockatoos rely on tree hollows in live or dead eucalypt trees for nesting. The destruction of these trees and their casuarina food trees are threatening the glossy black cockatoo (Department of Environment and Conservation 2004a).

**Swamp wallaby** *(Wallabia bicolour)*
The swamp wallaby is not as common in Sydney as it once was but it can still be found in its preferred habitat of thick forest undergrowth, such as the undergrowth found in the St Ives blue gum high forest. It feeds on various plants including introduced and native shrubs, grasses and ferns (Australian Museum 2007).

**Brush-turkey** (*Alectura lathami*)
Brush-turkeys feed on insects, seeds and fallen fruits, which they expose by raking up leaf litter. This gentle disturbance promotes seed germination (Australian Museum 2003). For example, blackbutt seedlings can grow in bare and sunny areas (Buchanan 1989). Therefore, raking up leaf litter and exposing bare soil under mature blackbutt trees will promote the germination of their seeds.

Swamp wallaby (*Wallabia bicolour*)
*Photo: Ken Stepnell DECC*

Glossy black cockatoos
*Photo: Adam Hend*

Smooth-barked apple
*Photo: Cheyne Ramsay*

# History of the St Ives blue gum high forest

## Aboriginal history

The Guringai territory stretched from the northern shore of Sydney Harbour to Broken Bay (Department of Environment and Conservation 2004b). The local Guringai Aboriginal people may have eaten the flora and fauna of the forest (Blue Gum High Forest Group 2007). There are no known relics of the Guringai people in the St Ives blue gum high forest.

## Non-Aboriginal history

The St Ives blue gum high forest has a rich history.

- **16 April 1788**: Governor Phillip, with a small exploratory party, passed very close to, if not through, St Ives blue gum high forest. John White, a member of the exploratory party, wrote: 'The land here was better than the parts which we have already explored'. However, the forest was too immense to penetrate and they returned to camp (Benson and Howell 1995).
- **1867**: Thomas Brown purchased the land now known as Browns Forest. He chose not to develop it, but willed it to his children (Blue Gum High Forest Group 2007).
- **1920**: The first Commissioner of Forests, Richard Dalrymple-Hay, purchased the forest for its historic interest and environmental educational purposes (Blue Gum High Forest Group 2007).
- **1931**: Ku-ring-gai Council, after a struggle with development proposals, purchased the land known as Browns Forest as a 'forest reserve for all time' (Blue Gum High Forest Group 2007).
- **1972**: Dalrymple–Hay was gazetted as a nature reserve (Department of Environment and Conservation 2004a).

Domestic animals have never grazed in the St Ives Blue Gum High Forest, and only the largest trees were selectively logged. Some parts of the forest, are composed of the same vegetation that existed before 1788 (Blue Gum High Forest Group 2007).

# Help preserve the St Ives blue gum high forest

## Be a blue gum high forest custodian

Contact your local council for information on blue gum high forest species and for the contact details of a nursery that can supply native plants from your local area.

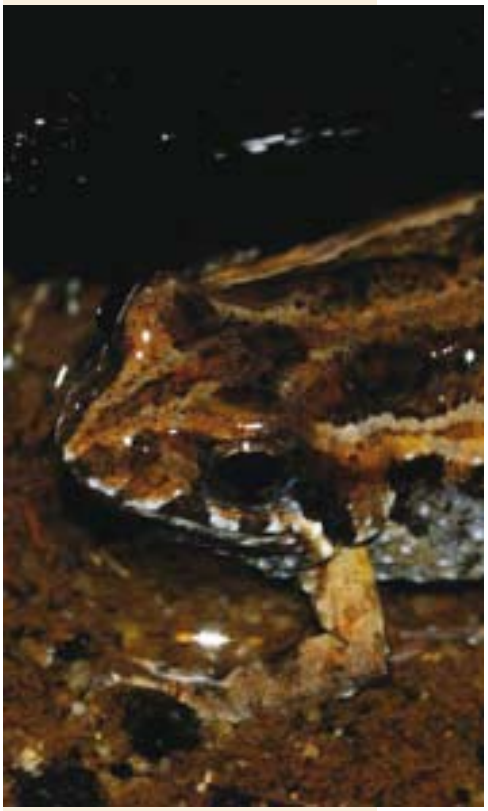
- Was your backyard once blue gum high forest?
- Are there any local native trees or plants left that you can nurture and protect?
- Can you replant some blue gum high forest plant species in your garden? By doing so, you will attract local native birds, mammals and butterflies to your garden. For example, planting casuarina and allocasuarina trees may attract the glossy black cockatoo.

Of course you cannot fit the entire forest ecosystem into your backyard, but there might be room for a selection of grasses, shrubs or trees. A group of backyards can form a forest.

Ku-ring-gai Council has introduced a **Backyard Bushcare Program**. This program focuses on regenerating native vegetation on private land to help create bushland corridors. Ku-ring-gai residents can ask for help to protect and regenerate blue gum high forest species in their backyards. Bushcare officers visit participating residents and offer:

- free expert advice
- practical training
- realistic action plans
- help with regeneration work
- ongoing support.

To get involved or find out more, call the Backyard Bushcare team on 9424 0933 or email backyardbushcare@kmc.nsw.gov.au.



Common eastern toadlet
*Photo: Cheyne Ramsay*

Narrow-leaved geebung
*Photo: Cheyne Ramsay*

Mowed understorey
*Photo: Nick Colman*

## Protect blue gum high forests from weeds and other threats

Blue gum high forests are threatened by weeds, increased stormwater runoff, fertilisers, rubbish dumping and clearing. These are worst at the edges of the forest where the bush meets roads, industry or backyards. Helpful neighbours can protect blue gum high forests from threats by:

- **Being careful when mowing lawns** – mowing underneath blue gum high forest species in residential gardens prevents their seedlings from establishing. By not mowing lawns and by hand weeding rather than poisoning weeds, you will promote the growth of blue gum high forest vegetation that may still be in the soil seedbank.
- **Weeding the garden** – removing weeds from local gardens will prevent them spreading into blue gum high forest. Birds can transport weed seeds large distances, so it is important to keep a weed-free garden even if you live a long way from a blue gum high forest.
- **Keeping stormwater out of the bush** – install a rainwater tank to minimise the impacts of stormwater, and if reusing greywater for watering gardens, use low phosphorus detergents.
- **Not dumping rubbish** – never dump garden refuse into bushland, as this helps weeds to spread into the bush.

### Go on an educational guided walk

The Walks and Talks Program run by DECC and Blue Gum High Forest Group conducts educational guided walks through the St Ives blue gum high forest. To date, more than 2000 people have been on these walks.

## Join a bushcare group

Bushcare volunteers work in the St Ives blue gum high forest on the second and fourth Sundays of each month from 9 am to 12 noon. For details of their work see 'Bush regeneration 1983 – present' on page10. Anyone is welcome to join the group and lend a hand. For more information on walks and talks and potential volunteer bushcare days, visit:

- www.environment.nsw.gov.au/youcanhelp/
- www.step.org.au
- www.kmc.nsw.gov.au.

## Conserve habitat for native animals

- Report any sightings of foxes to DECC or your local council.The regional fox baiting program run by Ku-ring-gai Council and DECC is already helping animals such as bandicoots and lyrebirds to survive.
- Keep pet cats and dogs under control, never let them wander into the bush, and keep them indoors at night. Train your dog not to chase or harass native wildlife.
- Leave some scrubby tangles and dense, shrubby areas of vegetation on your land for ringtail possums and native birds.
- Leave fallen timber, leaf litter and dead trees with hollows on your land for lizards, sugar gliders, brush-turkeys and small birds.

## Build a nesting box

Many of Australia's bird and mammal species require tree hollows for nesting. Unfortunately, the natural tree hollow forming process is very slow. On average it takes over 60 years for a tree to begin forming hollows.

Installing artificial nest boxes in your own backyard can provide a safe place for native animals to escape the elements and to raise a family. If you install a nest box you can potentially attract sugar gliders, parrots, kingfishers, microbats and possums to your garden. Always ensure cats and dogs cannot gain access to the nest box, and place it in a tree at least three metres above the ground. If introduced birds such as Indian mynas colonise the nest box, evict them.

Several websites contain information on building and placing nest boxes, and some organisations sell them. Search the internet using the following terms: 'nest', 'box', 'native', 'animals' and 'birds'.

Blue gum high forest
*Photo: Alan Kwok*

Bush regeneration in progress
*Photo: David Wilks*

# Bushcare in the St Ives blue gum high forest

## Bush regeneration 1983–present

Weeds are introduced plants that spread uncontrollably and threaten native plants. The survival of blue gum high forest depends on the ability of trees to regenerate. In a healthy blue gum high forest, this process continues unhindered. However, in St Ives, weeds such as lantana (*Lantana camara)*, corky passion fruit *(Passiflora suberosa)*, privet *(Ligustrum lucidum)*, Mickey Mouse plant (*Ochna serrulata*), honeysuckle (*Lonicera japonica*), asparagus fern (*Asparagus densifloras*), fishbone fern *(Nephrolepis cordifolia)* and trad, also known as wandering Jew *(Tradescantia fluminensis)* smother native species.

Without bush regeneration, weeds would eventually dominate blue gum high forest. Over the next 100–200 years, weeds would threaten successive generations of native plants. For example, the Sydney blue gum and blackbutt trees would eventually die and not be replaced.

Bush regeneration involves manually removing weeds from relatively weed-free areas and working slowly towards areas with many weeds. This technique gives native vegetation time to regenerate. Over the past 24 years, the volunteer Blue Gum High Forest Group, Ku-ring-gai Council and rangers from Lane Cove National Park have worked to successfully restore large sections of the St Ives blue gum high forest.

## The secret is in the seedbank

Many blue gum high forest plants can survive for decades as seeds stored in soil. Even if the forest appears weedy and degraded, it may still have native seed that can regrow. The soil seedbank is the key to regeneration. Controlled fire and weed removal kick-start the seedbank and help the forest to recover. Mulching should not be used as it prevents the seedbank from germinating.

When the seedbank has gone and the forest cannot regenerate, planting helps recover some of what was lost. Plants are grown from seeds collected from the blue gum high forest. If land is available, corridors can be created to link isolated forest remnants, or native plants can be regrown in areas taken over by weeds where only the native trees remain.

## Using fire to control weeds and encourage native vegetation growth

If blue gum high forest does not burn occasionally, many native plants, including the Sydney blue gum, gradually disappear. Many remaining blue gum high forests have not had fire through them for more than 30 years and seeds stored in the soil are diminishing. Forest managers of the St Ives blue gum high forest have implemented prescribed ecological burns since 1997.

Prescribed burns promote native regeneration, especially the growth of blue gum high forest plants, by:

- increasing the amount of sunlight reaching the soil
- encouraging new growth of fungi that aids the germinating seedlings
- releasing nitrogen and phosphorus into the soil (Buchanan 1989).

Preparing the area for a prescribed burn involves weeding it, then placing the weeds in piles. This technique encourages a high intensity fire which burns the area to an ash bed. Failure to achieve a high intensity fire will allow weeds to persist in unburnt patches of vegetation that will quickly recolonise the area.

After fires, skilled staff can easily target weeds without harming regenerating native plants.

Weed exclusion fence
*Photo courtesy of BARRC*

Prescribed ecological burn
*Photo courtesy of BARRC*

Sandstone boulders downstream of the gross pollutant trap
*Photo: Alan Kwok*

## Monitoring, maintenance and stormwater control

There are many ecological processes taking place in a bushland area. The St Ives blue gum high forest is continually monitored to measure how it is responding before, during and after restoration work, to find out which techniques are the most effective and to fine-tune these techniques.

Regenerated areas need ongoing management as it will take them years to be self-sustaining. Also, windblown weed seeds and seeds introduced by bird droppings mean that some form of maintenance will always be necessary to keep the St Ives blue gum high forest healthy.

Stormwater flows directly into the St Ives blue gum high forest, eroding creek banks and bringing refuse such as silt, nutrients and weeds into the area, creating ideal conditions for weed invasion. To prevent weeds from taking over, a gross pollutant trap has been installed to help filter stormwater.

The trap collects sediment, weeds and rubbish, and slows the velocity of water.

Sandstone boulders have been placed below the gross pollutant trap to minimise further creek bank erosion. These rocks slow down water pressure, permitting natural litter traps to form in the creek below. Natural litter traps consist of sand, silt and fallen branches that slow the water down even more and filter it.

**Help injured wildlife**
Native wildlife can suffer injuries through encounters with domestic animals, motor vehicles or misadventure.
If you come across injured wildlife, immediately contact Sydney Metropolitan Wildlife Service on (02) 9413 4300 or WIRES on (02) 8977 3333.

# Further reading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Department of Environment and Climate Change NSW;
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Ph: (02) 9995 5000 (switchboard)
Ph: 131 555 (environment information and publications requests)
Ph: 1300 361 967 (national parks information and publications requests)
Fax: (02) 9995 5999
TTY: (02) 9211 4723
Email: info@environment.nsw.gov.au
Website: www.environment.nsw.gov.au

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**Appendix 8. Pathways through conservationally significant vegetation in the Sydney region**

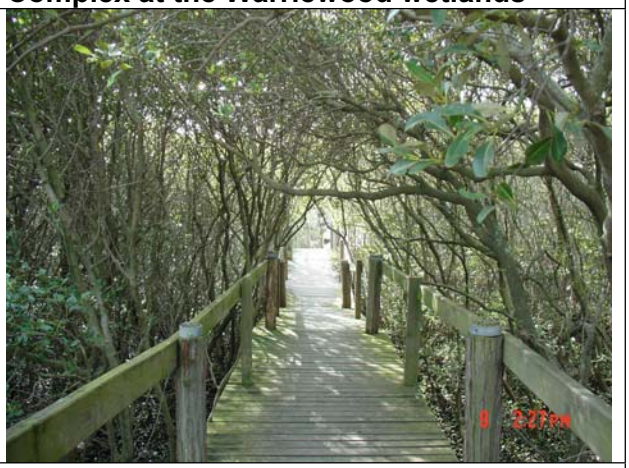
**Sydney Coastal Estuary Swamp Forest Complex at the Warriewood wetlands**

**Sydney Coastal Estuary Swamp Forest Complex at the Warriewood wetlands**

**Sydney Coastal Estuary Swamp Forest Complex at the Warriewood wetlands**

**Sydney Coastal Estuary Swamp Forest Complex at the Warriewood wetlands**

**Eastern Suburbs Banksia Scrub at Jennifer Street, Botany Bay National Park**



**Mangrove swamp at Towra Point Nature Reserve**

| | |
|---|---|
|  |  |
| **Mangrove swamp at Towra Point Nature Reserve** | **Mangrove swamp at Towra Point Nature Reserve** |

## Appendix 9. Ku-ring-gai Council Weed Management Policy – Revised Edition March 2007

Ku-ring-gai Council

# Weed Management Policy

Revised Edition March 2007

*Parietaria judaica*, Asthma Weed

Ku-ring-gai Council

# Weed Management Policy

Originally Adopted 14 December 1993
Revised version adopted … 2007

## Contents

# i Introduction

Weed management is an essential activity on all land in respect to State legislation, Common Law, the community's desire to maintain local landscape and Council's commitment to the principals and practices of Ecologically Sustainable Development (ESD). Aspects of health, safety, biodiversity conservation and amenity can be seriously affected by weeds.

The Ku-ring-gai Council area covers approximately 8536 hectares. Land uses include approximately 3730 hectares of residential zoning, 369 hectares of special use zoning, 48 hectares of business zoning, 1047 hectares of road reserves, 59 hectares of open space parks, 212 hectares of open space sportsgrounds, 70 hectares of State Authority land, 180 hectares of Private Open Space, 1100 hectares of bushland managed by Council and 1683 hectares of bushland managed by the NSW National Parks & Wildlife Service. It is essential that a consistent approach be adopted over these areas.

In this policy, weeds have been categorised into three categories. These being:

- Noxious Weeds, proclaimed by State Legislation (refer Appendix A);
- Urban Environmental Weeds, identified by Council as species which constantly cause public and private nuisance in Ku-ring-gai (refer Appendix B); and
- Nuisance Plants, considered by Council to be pest species in public open space (refer Appendix C).

This policy outlines Council's weed management philosophy in respect to relevant legislation and community concerns, and provides guidance for various Council programs. The policy also allows recognised actions outlined in the national and state strategies and various regional and catchment weed management strategies.

# 1. Weed Management Policies

## 1.1 Weed Control on Private Property / Regulatory Control

1.1.1 Make private property owners or occupiers aware of the presence of noxious weeds on their land.

***That it be Council Policy to***

1.1.2 Ensure private property owners or occupiers control noxious weeds in accordance with their obligations under the Noxious Weeds Act (1993) and ensure that their actions are undertaken in an environmentally sensitive manner, particularly in or near waterways.

1.1.3 Make exceptions, in respect to the removal of noxious weed trees, where a tree is deemed to have heritage significance – i.e. where the tree is a significant in the local landscape, or is on an identified heritage property or is within an Urban Conservation Area.

1.1.4 Make declared noxious weeds and urban environmental weeds exempt from protection under Council's Tree Preservation Order.

## 1.2 Development Control

1.2.1 Require the removal of noxious weeds and urban environmental weeds as a condition of development consent.

1.2.2 Require amendments to be made to landscape plans submitted as part of Development Applications, where they include or retain noxious weeds or urban environmental weeds.

***That it be Council Policy to***

1.2.3 Make exceptions, in respect to the removal of noxious weeds and urban environmental weeds, where a tree is deemed to have heritage significance - ie. where the tree is a significant feature in the local landscape, or is on an identified heritage property or is within an Urban Conservation Area

1.2.4 Require the removal of nuisance plants as a condition of development consent within 300m of a Natural Area, except where the plant is a tree and has significant landscape amenity value and presents no detriment to the natural environment.

## 1.3 Weed Control on Public Land

1.3.1 Undertake immediate eradication of noxious weed species that are not known to occur elsewhere in Ku-ring-gai (e.g. Class 1 noxious weeds).

1.3.2 Control and eradicate all species of noxious and environmental weeds on public land in accordance with the weed management priorities listed below.

1.3.3 In addition to 1.3.2 above, control nuisance plants in Natural Areas in accordance with the weed management priorities listed below.

1.3.4 Undertake weed control in Natural Areas in accordance with the following priorities; where weeds impact on:

***That it be Council Policy to***

1. biodiversity (threatened species and communities);
2. management burn areas (pre and post-fire weeding);
3. bushland areas in good condition;
4. local bushland areas maintained by Bushcare volunteers;
5. health and safety of recreational users;
6. aesthetic values.

1.3.5 Undertake weed control in Parks & Sportsgrounds in accordance with the following priorities; where weeds impact on:

1. health and safety of recreational users;
2. use and enjoyment of recreational users;
3. native vegetation or natural areas;
4. aesthetic values.

1.3.6 Undertake weed management in Road Reserves, Car Parks, Pathways and Business Centres in accordance with the following priorities; where weeds impact on:

1. vision of vehicular traffic;
2. health and safety of pedestrian users;
3. native vegetation or natural areas;
4. aesthetic values.

1.3.7 Ensure weed removal and control is an integral part of the establishment and maintenance stages of new capital/project works.

1.3.8 Undertake weed eradication in conjunction with planned landscape refurbishment within Parks, Sportsgrounds, Road Reserves, Business Centres, Car Parks and Pathways.

***That it be Council Policy to***

1.3.9 Participate in relevant catchment and regional weed plans and projects.

1.3.10 Inform Government authorities, responsible for managing land in Ku-ring-gai, as to Council's commitment to control noxious and urban environmental weeds.

## 1.4 Weed Eradication Methods & Applications

1.4.1 Undertake appropriate, industry-endorsed methods for the eradication of weeds, depending upon the species, location and land use.

1.4.2 Such methods can include:

- Physical removal with minimum disturbance to the surrounding environment;
- Herbicide applied in accordance with the Registered Label, Permit or Pesticide Order; or
- Biological controls that are approved by the Commonwealth Scientific & Industrial Research Organisation (CSIRO).

***That it be Council Policy to***

1.4.3 Not undertake herbicide spraying on blackberry when in fruit.

1.4.4 When spraying in or near watercourses, ensure herbicides registered for use in or near waterways are used, or that appropriate licences are obtained which include conditions to minimise the impact on the environment.

1.4.5 Have regard for Integrated Pest Management (IPM) principles when determining options for weed control.

1.4.6 Ensure public notification of herbicide applications is consistent with Council's Pesticide Notification Plan (2006).

***That it be Council Policy to***

1.4.7 Ensure Council employees and volunteers undertaking weed control on public land conduct their activities in accordance with Council's Occupational Health and Safety Policy.

1.4.8 Ensure contract staff carrying out weed control on public land, conduct their activities in accordance with this policy, occupational health and safety requirements and the Pesticides Act (1999).

## 1.5 Prevention

***That it be Council Policy to***

1.5.1 Maintain the environmental conditions that are conducive to the health and vigour of desirable vegetation.

1.5.2 Ensure all works on public land do not include planting of noxious weeds or urban environmental weeds.

1.5.3 Not plants nuisance plants on public land within 300m of Natural Areas, except when nuisance plant is a mown ground cover and there are physical barriers constructed that is capable of restricting vegetative spread.

1.5.4 Investigate alternative indigenous grass species for turf and lawn areas adjacent to Natural Areas.

1.5.5 Ensure landscape and erosion control materials used by Council (such as topsoil and straw bales etc.) are free of weed seeds and propagules.

1.5.6 Ensure council staff and contractors do not discard vegetation material (e.g. lawn clippings) into Natural Areas.

1.5.7 Regulate private companies involved with the sale of plants, to ensure that they do not stock or distribute noxious weeds (including hybrids), and discourage sale of urban environmental weeds and nuisance plants.

1.5.8 Investigate potential for the remediation of locations and/or infrastructure known to be weed point sources.

## 1.6 Community Education

***That it be Council Policy to***

1.6.1 Provide assistance to the public with the identification of noxious weeds, urban environmental weeds and nuisance plants.

1.6.2 Undertake educational and awareness programs to encourage private owners or occupiers to eradicate and not propagate noxious weeds, urban environmental weeds and nuisance plants on their land.

1.6.3 Encourage and provide advice as to suitable replacement species for noxious weeds, urban environmental weeds and nuisance plants, including the nursery industry.

## 1.7 Incentives

***That it be Council Policy to***

1.7.1 Investigate, encourage and utilise opportunities for incentive programs which encourage the removal of noxious weeds, urban environmental weeds and nuisance plants on private or public land.

# 2. Administration

This policy is administered and enacted in accordance with the delegations of authority from the Council to the General Manager and subsequent delegations from the General Manager to staff. It will be reviewed every four years or as required.

The attached schedules in the appendices may be reviewed and amended by the Minister for Agriculture and Council and declared or adopted separately without alterations to the policy statements in section 1 of this document.

# 3. Definitions

**Biodiversity:** is the variety of life forms, the different plants, animals and micro-organisms, the genes they contain and the ecosystems they form. It is usually considered at three levels: genetic diversity, species diversity and ecosystem diversity.

**Bushland:** is land on which there is vegetation that is either a remnant of the natural vegetation of the land or, if altered, is still representative of the structure and floristics of the natural vegetation.

**Ecologically Sustainable Development (ESD):** is development that uses, conserves and enhances the community's resources so that ecological processes, on which life depends, are maintained and the total quality of life now and in the future can be increased.

**Landscape:** is the composite of natural and human features that characterise the surface of the land; includes spatial, textural, compositional and dynamic aspects of the land.

**Natural Areas:** are areas of community land that have been classified by Council under the Local Government Act (1993) as bushland, wetland, escarpment, watercourse or foreshore.

**Noxious Weeds:** are declared by the Minister of Agriculture under the provisions of the Noxious Weeds Act, 1993. Noxious weeds are considered to be a serious threat to human or animal health, agricultural production, natural resources or native ecological communities.

**Nuisance Plants:** are considered by Council to be pest species in public open space.

**Tree:** means a plant with any one or all of the following criteria:

- A perennial plant with at least one self supporting woody, fibrous stem, whether native or exotic, which is 5 metres or more in height or
- has a trunk diameter of 150mm or more measured at ground level .

**Urban Environmental Weeds:** are identified by Council as species that constantly cause public and private nuisance in Ku-ring-gai.

**Weed:** is a plant growing in a location where it degrades the designated land use, or a plant in a location that can readily spread to degrade other land.

# 4. Legislation

## 4.1 Statutory Obligations

Council has the statutory responsibility and powers with respect to weed management under the following NSW legislation and State Planning Policies:

- Pesticides Act, 1999.
- Noxious Weeds Act, 1993.
- Occupational Health and Safety Act, 1983.
- State Environmental Planning Policy No.19 - Bushland in Urban Areas, 1986.
- Environmental Planning and Assessment Act, 1979.

## 4.2 Pesticides Act, 1999

The Pesticides Act (1999) aims to protect and minimise risks to human health, the environment, property and trade in relation to use of pesticides. This includes the use of herbicides for weed control. It is an offence to use a pesticide in a way that causes injury or likely injury to another person, damage or likely damage to another person's property or harm to a non-target plant or animal.

The Act requires all pesticides and container labels to be registered and approved by National Registration Authority. The Act also requires all persons intending to use or store pesticides, to read and carefully follow all instructions on the product label for the correct use, storage and disposal of the pesticide, and not alter, deface, obliterate or destroy the product label. When using or storing a pesticide, persons shall not willingly or carelessly disregard any instructions or use the pesticide contrary to the product label unless a Permit or Order for off-label use has been issued.

## 4.3 Noxious Weeds Act, 1993

The Noxious Weeds Act (1993) provides for the appropriate Minister to issue an Order declaring a plant noxious. This declaration may specify a plant to be noxious in a determined portion, or the whole of the State.

The weeds declared as noxious in the Ku-ring-gai Council area are listed in Appendix A. These noxious weeds have been partitioned into five (5) classes as specified in the Act, being Class 1, Class 2, Class 3, Class 4 and Class 5.

The action required for each control class is:

**Class 1 - State Prohibited Weeds**. "*The plant must be eradicated from the land and the land must be kept free of the plant.*"

**Class 2 - Regionally Prohibited Weeds.** "*The plant must be eradicated from the land and the land must be kept free of the plant.*"

**Class 3 - Regionally Controlled Weeds.** *"The plant must be fully and continuously suppressed and destroyed."*

**Class 4 - Locally Controlled Weeds.** *"The growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority."*

**Class 5 - Restricted Plants.** *"The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with."*

The control objectives for each class are:

- the control objective for weed control class 1 is to prevent the introduction and establishment of those plants in NSW.
- the control objective for weed control class 2 is to prevent the introduction and establishment of those plants in parts of NSW.
- the control objective for weed control class 3 is to reduce the area and the impact of those plants in parts of NSW.
- the control objective for weed control class 4 is to minimise the negative impact of those plants on the economy, community or environment of NSW.
- the control objective for weed control class 5 is to prevent the introduction of those plants into NSW, the spread of those plants within NSW or from NSW to another jurisdiction.

## 4.4 Occupational Health and Safety Act, 1983

The Occupational Health and Safety Act (1983) requires Council to ensure the health, safety and welfare of staff or voluntary personnel carrying out weed management activities on community land. This applies in particular to those persons involved with the use of machinery and herbicides. Various regulations and codes of practice under the Act relate to the control of hazardous substances including most pesticides. For example, the Occupational Health and Safety (Hazardous Substances) Regulation 1996 covers identification of hazardous substances in the workplace and the assessment and control of risks associated with their use.

## 4.5 State Environmental Planning Policy No. 19

State Environmental Planning Policy No. 19 requires Council to remove weeds from bushland in accordance with the policy's primary aim "to protect and preserve bushland within the urban area, so as to provide representation of the original vegetation in its natural state and enable the existing plant communities to survive in the long term". In accordance with this policy, developments adjacent to bushland are subject to Council's conditions of consent. These conditions of consent require the developer to remove any noxious weeds, urban environmental weeds or nuisance plants.

## 4.6 Environmental Planning and Assessment Act, 1979

The Environmental Planning and Assessment Act (1979) enables Council to undertake environmental planning and development control and consider the protection of existing vegetation. The Act allows Council to request and assess landscape plans and impose appropriate conditions of consent on development. These conditions of consent may require existing noxious weeds, urban environmental weeds or nuisance plants to be removed and proposed noxious weeds, urban environmental weeds or nuisance plants to be substituted. Under the Act, Council also has to consider the impact on the environment as a result of the removal of large trees, some of which may be listed as noxious or urban environmental weeds.

# Appendix A. - Noxious Weeds

Declared under Noxious Weeds Act (1993); as at January 2006.

(refer to section 4.3 for control class descriptions)

## Class 1:

| Common Name | Botanical Name |
|---|---|
| Anchored Water Hyacinth | *Eichhornia azurea* |
| Black knapweed | *Centaurea nigra* |
| Broomrapes | *Orobanche spp.* |
| Chinese Violet | *Asystasia gangetica* |
| East Indian Hygrophila | *Hygrophila polysperma* |
| Eurasian Watermilfoil | *Myriophyllum spicatum* |
| Hawkweeds | *Hieracium spp.* |
| Horsetail | *Equisetum spp.* |
| Hymenachne | *Hymenachne amplexicaulis* |
| Karoo Thorn | *Acacia karoo* |
| Kochia | *Bassia scoparia* |
| Lagarosiphon | *Lagarosiphon major* |
| Mexican feather grass | *Nassella tenuissima* |
| Miconia | *Miconia spp.* |
| Mimosa | *Mimosa pigra* |
| Parthenium Weed | *Parthenium hysterophorus* |
| Pond Apple | *Annona glabra* |
| Prickly Acacia | *Acacia nilotica* |
| Rubbervine | *Cryptostegia grandiflora* |
| Senegal Tea Plant | *Gymnocoronis spilanthoides* |
| Siam Weed | *Chromolaena odorata* |
| Spotted knapweed | *Centaurea maculosa* |
| Water caltrop | *Trapa spp.* |
| Water Lettuce | *Pistia stratiotes* |
| Water Soldier | *Stratiotes aloides* |
| Witchweed | *Striga spp.* |
| Yellow burrhead | *Limnocharis flava* |

## Class 2:

| Common Name | Botanical Name |
|---|---|
| Hygrophila | *Hydrophila costata* |
| Salvinia | *Salvinia molesta* |
| Water Hyacinth | *Eichhornia crassipes* |

## Class 3:

| Common Name | Botanical Name |
|---|---|
| Alligator Weed | *Alternanthera philoxeroides* |
| Bitou Bush / Boneseed | *Chrysanthemoides monilifera* |
| Cape Broom | *Genista monspessulana* |
| Green Cestrum | *Cestrum parqui* |
| Long-leaf Willow Primrose | *Ludwigia longifolia* |
| Ludwigia | *Ludwigia peruviana* |
| Pampas Grass | *Cortaderia spp.* |
| Tussock Paspalum | *Paspalum quadrifarium* |

## Class 4:

| Common Name | Botanical Name |
|---|---|
| Asparagus Fern | *Asparagus aethiopicus* |
| Balloon Vine | *Cardiospermum grandiflorum* |
| Blackberry | *Rubus fruticosus (agg. spp.)* |
| Bridal Creeper | *Asparagus asparagoides* |
| Camphor Laurel | *Cinnanomum camphora* |
| Cape Ivy | *Delairea odorata* |
| Castor Oil Plant | *Ricinus communis* |
| Cats Claw Creeper | *Macfadyena unguis-cati* |
| Chilean Needle Grass | *Nassella neesiana* |
| Climbing Asparagus | *Protasparagus plumosus* |
| English/Scotch Broom | *Cytisus scoparius* |
| Giant Reed | *Arundo donax* |
| Harrisia Cactus | *Harrisia spp.* |
| Lantana | *Lantana spp.* |
| Madeira Vine | *Anredera cordifolia* |
| Morning Glory (coastal) | *Ipomoea cairica* |
| Morning Glory (blue) | *Ipomoea indica* |
| Ochna | *Ochna serrulata* |
| Pellitory/Asthma Weed | *Parietaria judaica* |
| Prickly Pears | *Opuntia/Cylindropuntia spp.* |
| Privet (large-leaf) | *Ligustrum lucidum* |
| Privet (small-leaf) | *Ligustrum sinense* |

| | |
|---|---|
| Rhizomatous Bamboo | *Phyllostachys spp.* |
| Rhus Tree | *Toxicodendron succedanea* |
| Serrated Tussock | *Nassella trichotoma* |
| St John's Wort | *Hypericum perforatum* |
| Trad / Spiderwort | *Tradescantia fluminensis* |
| Turkey Rhubarb | *Acetosa sagittata* |

## Class 5:

| **Common Name** | **Botanical Name** |
|---|---|
| African Feather Grass | *Pennisetum macrourum* |
| African Turnip x2 sp | *Sisymbrium thellungii & runcinatum* |
| Annual Ragweed | *Ambrosia artemisiifolia* |
| Arrowhead | *Sagittaria montevidensis* |
| Artichoke Thistle | *Cynara cardunculus* |
| Athel Tree / Athel Pine | *Tamarix aphylla* |
| Bear-skin Fescue | *Festuca gautieri* |
| Bridal Creeper | *Asparagus asparagoides* |
| Burr Ragweed | *Ambrosia confertiflora* |
| Cabomba | *Cabomba spp. (except C. furcata)* |
| Cayenne Snakeweed | *Stachytarpheta cayennensis* |
| Clockweed x 2 sp | *Gaura parviflora & lindheimeri* |
| Corn Sowthistle | *Sonchus arvensis* |
| Dodder | *Cuscuta campestris* |
| Espartillo | *Achnatherum caudatum* |
| Fine-bristled Burr grass | *Cenchrus brownii* |
| Fountain Grass | *Pennisetum setaceum* |
| Gallon's Curse | *Cenchrus biflorus* |
| Glaucous Star Thistle | *Carthamus glaucus* |
| Golden Thistle | *Scolymus hispanicus* |
| Lantana | *Lantana spp.* |
| Long-leaf Willow Primrose | *Ludwigia longifolia* |
| Mexican Poppy | *Argemone mexicana* |
| Mossman River grass | *Cenchrus echinatus* |
| Onion Grass | *Romulea spp.* |
| Oxalis (except natives) | *Oxalis spp.* |
| Red Rice | *Oryza rufipogon* |
| Sagittaria | *Sagittaria platyphylla* |
| Sand Oat | *Avena strigose* |
| Smooth-stem turnip | *Brassica barrelieri* |
| Soldier Thistle | *Picnomon acarna* |

| | |
|---|---|
| Texas Blueweed | *Helianthus ciliaris* |
| Willows | *Salix spp. (except S. baby lonica, S reichardtii and S. calodendron).* |
| Yellow Nutgrass | *Cyperus esculentus* |

# Appendix B. – Urban Environmental Weeds

Adopted by Council, *#date#*

| **Botanical Name** | **Common Name** |
|---|---|
| *Acacia saligna* | Golden Wreath Wattle |
| *Acer negundo* | Box Elder |
| *Ailanthus altissima* | Tree of Heaven |
| *Celtis spp.* | Celtis |
| *Cotoneaster spp.* | Cotoneaster |
| *Erythrina crista-galli* | Common Coral Tree |
| *Erythrina indica* | Indian Coral Tree |
| *Ficus elastica* | Rubber Tree |
| *Ficus pumila* | Climbing Fig |
| *Hedera helix* | Ivy |
| *Olea europaea subsp. Africana* | African Olive |
| *Pyracantha spp.* | Firethorn |
| *Rhaphiolepis indica* | Indian Hawthorn |
| *Salix babylonica* | Weeping Willow |
| *Senna pendula* | Cassia |

# Appendix C. – Nuisance Plants

Adopted by Council, *#date#*

| Botanical Name | Common Name |
|---|---|
| *Acacia baileyana* | Cootamundra Wattle |
| *Acacia podalyriifolia* | Queensland Silver Wattle |
| *Agapanthus orientalis* | Agapanthus |
| *Ageratina spp.* | Crofton Weed/Mist Weed |
| *Alectryon tormentosum* | Rambutan |
| *Amaranthus viridis* | Green Amaranth |
| *Angiozanthos flavidus* | Yellow Kangaroo Paw |
| *Araujia sericiflora* | Moth Vine |
| *Aristea ecklonia* | Ecklonia |
| *Brachychiton acerifolius* | Illawarra Flame Tree |
| *Chlorophytum comosum* | Spider Plant |
| *Conium maculatum* | Hemlock |
| *Conyza spp.* | Fleabane |
| *Coreopsis lanceolata* | Coreopsis |
| *Crocosmia x crocosmiiflora* | Montbretia |
| *Cyathea cooperi* | Scaly Tree-fern |
| *Cynodon dactylon* | Common Couch |
| *Cupressocyparis x leylandii* | Leyland Cypress |
| *Eragrostis curvula* | African Lovegrass |
| *Erharta spp.* | Erharta |
| *Erigeron karvinskianus* | Seaside Daisy |
| *Foeniculum vulgare* | Fennel |
| *Genista spp.* (all cultivars & hybrids) | Broom |
| *Grevillea robusta* | Silky Oak |
| *Hedychium gardneranum* | Ginger Lily |
| *Impatiens balsamina* | Impatiens |
| *Jasminum polyanthum* | Jasminum |
| *Lilium formosanum* | Formosan Lily |
| *Liquidambar styraciflua* | Liquidambar |
| *Lonicera japonica* | Honeysuckle |

| Botanical Name | Common Name |
|---|---|
| *Nephrolepis cordifolia* | Fishbone Fern |
| *Nothoscordum borbonicum* | Onion Weed |
| *Oxalis spp.* | Oxalis |
| *Parthenocissus quinquefolia* | Virginia Creeper |
| *Paspalum dilatatum* | Paspalum |
| *Passiflora edulis* | Passionfruit |
| *Paraserianthes lophantha* | Albizia, Crested Wattle |
| *Pennisetum clandestinum* | Kikuyu Grass |
| *Persicaria capitata* | Japanese Knotweed |
| *Phoenix canariensis* | Date Palm |
| *Phytolacca octandra* | Inkweed |
| *Pistacia chinensis* | Chinese Pistachia |
| *Plantago lanceolata* | Plantain |
| *Psoralea pinnata* | Scurfy Pea Bush |
| *Ranunculus repens* | Creeping Buttercup |
| *Robinia pseudoacacia* | Black Locust |
| *Robinia pseudoacacia "Frisia"* | Golden Robinia |
| *Rumex crispus* | Curled Dock |
| *Sapium sebiferum* | Chinese Tallow Tree |
| *Senecio madagascariensis* | Fireweed |
| *Setaria palmifolia* | Palm Grass |
| *Sida rhombifolia* | Paddy's Lucern |
| *Solanum jasminoides* | Potato Vine |
| *Solanum mauritianum* | Wild Tobacco Tree |
| *Sollya heterophylla* | Western Australian Bluebell |
| *Tetrapanax papyriferus* | Rice Paper Plant |
| *Verbena bonariensis* | Purple Top |
| *Vicia spp.* | Vetch |
| *Watsoni a meriana c. Bulbillifera* | Wild Watsonia |

Ku-ring-gai Council
818 Pacific Highway
Gordon NSW 2072
Ph: (02) 9424 0888
www.kmc.nsw.gov.au