

## CONSTRUCTION CERTIFICATE

issued under the Environmental Planning and  
Assessment Act 1979  
Section 109C (1) (b), 81A (2) and 81A (4)

rec-

127970

**COUNCIL:** Pittwater

**CONSTRUCTION CERTIFICATE NO:** 2003/251

### APPLICANT

**Name** Mr Robert Richer  
**Address** 15 Boronia Road, Ingleside NSW 2101  
**Contact No: (telephone/fax)** 9999 2552

### OWNER

**Name** Mr R Richer & Ms Jan Gobsill  
**Address** 15 Boronia Road, Ingleside NSW 2101  
**Contact No: (telephone/fax)** 9999 2552

### SUBJECT LAND

**Address** 15 Boronia Road, Ingleside  
**Lot No: 2** DP: 314402

### DESCRIPTION OF DEVELOPMENT

**Type of Work** ☒ Building work ☐ Subdivision work  
**Description** Onsite wastewater disposal system

Insight Development Consultants Pty Limited

**COUNCIL  
COPY**

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**DEVELOPMENT CONSENT**

Development Consent No: NO 766/02 (as modified)  
Date of Determination 12 June 2003

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**BUILDING CODE OF AUSTRALIA**

Building Classification 10b

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**BUILDER or OWNER/BUILDER** AAA Wastewater  
Contractor License No./Permit  
No. in case of Owner Builder

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**\$ VALUE OF WORK**

Building/Subdivision \$4,500.00

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**DATE C.C APPLICATION RECEIVED**

Date Received 27 October 2003

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**DETERMINATION**

Decision Approved  
Date of Decision 30 October 2003

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**ATTACHMENTS** Nil

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Insight Development Consultants Pty Limited

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**PLANS AND SPECIFICATIONS****APPROVED/REFUSED**

List plan no(s) and specifications  
Reference

1. Plan of Effluent reuse area and proposed Taylex Clearwater Sewage Treatment System as Stamped Approved by Pittwater Council.
2. Form 2 of Policy 144 "Geotechnical Risk Management Policy for Pittwater" completed by J Hodgson Geotechnical Engineer, dated 16 October 2003.
3. Plan of Bush Fire Asset Protection Zone, endorsed by R Coffey, Bush Fire Consultant, dated 31 July 2003.
4. Certified copy of Bushland Management Plan, prepared by Dragonfly Environmental, dated August 2003, including Bush Fire Report, Reference No. 31-07-2003-1, prepared by Fire Base Consulting, dated 31 July 2003.

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**RIGHT OF APPEAL**

*under S109K where the Certifying Authority is a Council an applicant may appeal to the Land and Environmental Court against the refusal to issue a Construction Certificate within 12 months from the date of the decision.*

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**CERTIFICATE**

Certificate Final

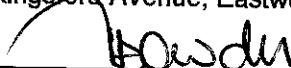
I certify that the work if completed in accordance with these plans and specifications will comply with the requirements of S81A(5) of the land Environmental Planning and Assessment Act 1979.

---

**CERTIFYING AUTHORITY**

Name of Certifying Authority    Insight Development Consultants Pty. Limited  
Name of Accredited Certifier    Tom Bowden  
Registration No                      93  
Contact No                            (02) 9889 4770  
Address                                7 Kingsford Avenue, Eastwood NSW 2122

**SIGNED**



**DATE**

30 OCT 2003

**ENVIRONMENTAL SUSTAINABILITY POLICY FOR PITTWATER**  
**FORM NO. 3A REQUIREMENTS FOR ECOLOGICAL SUSTAINABILITY PLAN**  
**To be attached to Plan**

Development Application for MR BOB RICHER

Address of site 15 BORONIA RD, INGLESIDE NSW

Declaration made by environmental consultant as part of the Ecological Sustainability Plan or Ecological Sustainability Concept Plan

I, ANDRE OLSON of Dragonfly Environmental

on this the 31-07-03

(Date)

certify that I have completed the following as marked:

**Site Plan**

The following check sheet is to be completed and attached to the Map for the Ecological Sustainability Plan or Ecological Sustainability Concept Plan

| <b>Annotated plan showing the following</b>                                                                |  | <b>✓ or n/a</b>          |
|------------------------------------------------------------------------------------------------------------|--|--------------------------|
| All areas of native vegetation                                                                             |  | ✓                        |
| Native trees include species, size, condition (e.g. SULE rating)                                           |  | None                     |
| Accurate survey and describe native trees within 5m of proposed works                                      |  | ✓                        |
| Trees to be retained and those to be modified/removed                                                      |  | ✓                        |
| Areas with medium to high regeneration potential                                                           |  | - in fuel free zone na   |
| Areas of native vegetation to be retained                                                                  |  | ✓                        |
| Areas of vegetation proposed to be removed                                                                 |  | ✓                        |
| Areas of Noxious and Environmental Weeds                                                                   |  | scattered ✓              |
| Areas of habitat features, bushrock (over 2m), caves, termite mounds etc                                   |  | bushrock only ✓          |
| Footprint of house and associated works (fuel reduced zones, waste-water etc)                              |  | ✓                        |
| Areas for exclusion fencing—during development/establishment phase                                         |  | ✓                        |
| Areas appropriate for storage of materials during construction                                             |  | on cleared site ✓        |
| Recommended access ways during construction                                                                |  | na - all ready present ✓ |
| Areas for bush-regeneration                                                                                |  | na                       |
| Areas for planting trees (if appropriate)                                                                  |  | na                       |
| Areas for planting low and or mid strata                                                                   |  | ✓                        |
| Areas for landscaping                                                                                      |  | ✓                        |
| Fuel reduced zone                                                                                          |  | ✓                        |
| Fuel free zone                                                                                             |  | ✓                        |
| Waste-water disposal zone                                                                                  |  | ✓                        |
| Recommended Environmental Protection Zone (EPZ) if appropriate                                             |  | rest of block/bushland ✓ |
| Areas for managing domestic animals (see requirements of Pittwater Council Control Documents Pittwater 21) |  | ✓                        |
| Wildlife Corridors and Core/Fragmented Bushland (as per Pittwater Council Maps)                            |  | addressed ✓              |

**GEOTECHNICAL RISK MANAGEMENT POLICY FOR PITTWATER**  
**FORM NO. 2 – To be submitted with detailed design for construction certificate**

|                                                  |
|--------------------------------------------------|
| Development Application for <u>R Ricker</u>      |
| Name of Applicant                                |
| Address of site <u>15 Boronia Road Ingleside</u> |

Declaration made by Structural or Civil Engineer in relation to the incorporation of the Geotechnical issues into the project design

I, J HODGSON (insert name) on behalf of Sack Hodgson Consultants Pty. (trading or company name)

on this the 16-10-03 (date)

certify that I am a Structural or Civil Engineer as defined by the Geotechnical Risk Management Policy for Pittwater. I am authorised by the above organization/company to issue this document and to certify that the organization/company has a current professional indemnity policy of at least \$2million. I also certify that I have prepared the below listed structural documents in accordance with the recommendations given in the Geotechnical Report for the above development

**Geotechnical Report Details:**

|                                                                                                          |
|----------------------------------------------------------------------------------------------------------|
| Report Title: <u>Risk Analysis &amp; Risk Management for Proposed House at 15 Boronia Road Ingleside</u> |
| Report Date: <u>16-10-03</u>                                                                             |
| Author: <u>J HODGSON</u>                                                                                 |

**Structural Documents list:**

|                                      |
|--------------------------------------|
| <u>Plan of Water Treatment Tank.</u> |
|                                      |
|                                      |

I am also aware that Pittwater Council relies on the processes covered by the Geotechnical Risk Management Policy, including this certification as the basis for ensuring that the geotechnical risk management aspects of the proposed development have been adequately addressed to achieve an "Acceptable Risk Management" level for the life of the structure taken as at least 100 years unless otherwise stated and justified.

J HODGSON  
(name)

J Hodgson  
(signature)

**Declaration made by Geotechnical Engineer or Engineering Geologist in relation to Structural Drawings**

I prepared and/or technically verified the abovementioned Geotechnical Report as per Form 1 dated \_\_\_\_\_ and now certify that I have viewed the above listed structural documents prepared for the same development. I am satisfied that the recommendations given in the Geotechnical Report have been appropriate taken into account by the structural engineer in the preparation of these structural documents. I am aware that Pittwater Council relies on the processes covered by the Geotechnical Risk Management Policy, including this certification as the basis for ensuring that the geotechnical risk management aspects of the proposed development have been adequately addressed to achieve an "Acceptable Risk Management" level for the life of the structure taken as at least 100 years unless otherwise stated and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk.

Signature J Hodgson  
Name J HODGSON  
Chartered Professional Status MEMBER FIEAust.  
Membership No. 149 788

**COUNCIL  
COPY**

AND EFFICIENT REUSE AREA AT  
INSIGHT DEVELOPMENT  
CONSULTANTS PTY LTD LESIDE

CONSTRUCTION CERT. NO. 2003/251

**CONSTRUCTION  
CERTIFICATE <sup>Form</sup> PLANS**

30 OCT 200

PROPOSED EFFLUENT RE-USE.....  
AREA = 505m<sup>2</sup> Predication No. 93

**ZONE 1**

NOTE: TIME SURVEYS FOR CORTINA PURPOSES ONLY.  
THE RULE BOUNDARIES HAVE BEEN OBTAINED  
BY PLAN TIMING ONLY AND NOT BY FIELD SURVEY.  
IMPROVES KNOWN HAVE BEEN LOCATED WHERE POSSIBLE  
BY THE SURVEY.

FOR: MR. B. RICHER + MS. J. GOBSILL

DRAWN:  
G. AUSTIN, BMG+~~ES~~ P/L  
MARCH, 2002

LGA: PITTSWATER COUNCIL

PLEASE NOTE: The stamping of this plan by Insight Development Solutions Pty Ltd does not relieve the Applicant's responsibility to obtain approval from Sydney Water or other utilities prior to the commencement of any works.

**Call Before You Dig - 800-4-A-DIG**

~~THE COUNCIL OF PITTSBURGH~~

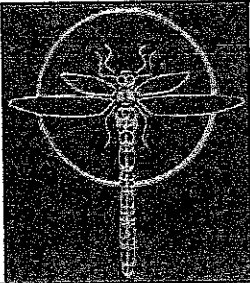
**APPROVED**  
DEVELOPMENT CONSENT PLAN

**COPIES**

**BORONIA ROAD**

# Dragonfly Environmental

Environmental  
Consultancy  
103 Whale Beach Rd  
Avalon 2107  
Australia  
Tel : 0409 840 826  
Fax: (02) 99184486  
ABN 72875068377  
DragonflyEnviron@aol.com



**From:** ☒ André Olson ☐ Mike Pattison ☐ Mark Schultz

**To:**

**For:**  
Action ☒ Information ☐

**Subject: 15 Boronia Rd Ingleside**

Date: 26.09.03

To Whom It May Concern:

As a condition of development consent a Bushland Management Plan (BMP) was required for 15 Boronia, Ingleside under Development Application No. NC806/02 and N0879/02. The BMP completed by Dragonfly Environmental (Environmental Consultants) is consistent with Department of Urban Affairs and Planning's Urban Bushland Management Plan Guidelines, The Conservation of Biodiversity DCP and the Management Plan for Threatened Fauna and Flora in Pittwater.

In particular it addresses and satisfies matters: B15, B15b, B15c and B16 outlined in the notice to applicant of determination of a development application by Pittwater Council.

Kind Regards,

*a. Olson*

André Olson

Dragonfly Environmental

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**ENVIRONMENTAL SUSTAINABILITY POLICY FOR PITTSWATER**  
**FORM NO. 3B ECOLOGICAL SUSTAINABILITY PLAN REQUIREMENTS**  
**To be attached to inside front cover of ESP Report**

Development Application for MR BOB RYCHER  
Name of Applicant

Address of site 15 BORONIA RD, INGLESIDE NSW

*Declaration made by environmental consultant as part of the Ecological Sustainability Plan*

I, André Olson of Dragonfly Environmental  
(Insert Name) (Trading or Company Name)

on this the 31. 07. 03  
(Date)

certify that I have completed the following as marked:

*The following is to be completed and attached to the inside front cover of the Ecological Sustainability Plan.*

| Report covering                                                                                                                                                                                                                                                                                                                                                   | ✓ or n/a                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>Site Preparation</b>                                                                                                                                                                                                                                                                                                                                           |                               |
| Description of:                                                                                                                                                                                                                                                                                                                                                   |                               |
| <ul style="list-style-type: none"> <li>Tree, vegetation and habitat protection,</li> <li>Sediment and erosion control for natural features,</li> <li>Weed control,</li> <li>Surface treatment and stabilisation (mulch etc), top soil/ litter layer treatment,</li> <li>Site drainage with respect to natural features,</li> </ul>                                | ✓<br>✓<br>✓<br>✓ present<br>✓ |
| <b>Weed Removal and Regeneration</b>                                                                                                                                                                                                                                                                                                                              |                               |
| <ul style="list-style-type: none"> <li>List of Noxious and Environmental Weeds</li> </ul>                                                                                                                                                                                                                                                                         | ✓                             |
| <ul style="list-style-type: none"> <li>Timeline for removing Noxious Weeds and controlling/removing Environmental Weeds (for updated weeds list see Dept of Agriculture web page). Timeline to include the area / number of weed species acceptable as a background level. Cross reference location with Map.</li> </ul>                                          | all to be removed             |
| <b>Description of Planting (if planting)</b>                                                                                                                                                                                                                                                                                                                      |                               |
| <ul style="list-style-type: none"> <li>Planting aims, e.g. supplementary planting in a regeneration area, or a native vegetation area or planting in a landscape area.</li> </ul>                                                                                                                                                                                 | ✓                             |
| <ul style="list-style-type: none"> <li>Species list recommended for planting—as appropriate (if the ESP is replacing a Landscaping Plan give details of species to be planted and size range / species). Local native species to be used (for at least 70% of plantings, 80% in Endangered Ecol. Comm.). Identify source of local native, plant stock.</li> </ul> | ✓                             |
| <ul style="list-style-type: none"> <li>Description of areas for bush regeneration, trees to be retained, trees to be planted (and what size), etc</li> </ul>                                                                                                                                                                                                      | no trees to be planted        |
| <ul style="list-style-type: none"> <li>A schedule of materials—including elements such as weed matting, mulch, edging, walling, paving and fencing.</li> </ul>                                                                                                                                                                                                    | NA                            |
| <ul style="list-style-type: none"> <li>Description of works meeting minimum requirements of Landscaping Policy (i.e. 50% of development screened in 3 yrs).</li> </ul>                                                                                                                                                                                            | NA - already present          |
| <b>Long-term Management</b>                                                                                                                                                                                                                                                                                                                                       |                               |
| <ul style="list-style-type: none"> <li>Management of habitat, inc. protection during construction and for the life of development. Provision of nesting boxes etc. Maintenance for 12 to 24 months after Issue of Occupation Certificate—maintenance can be by land occupier.</li> </ul>                                                                          | ✓                             |
| <ul style="list-style-type: none"> <li>Indicate areas that are to be kept as 'bushland' for the life of the development</li> </ul>                                                                                                                                                                                                                                | ✓                             |
| <ul style="list-style-type: none"> <li>Description of exclusion areas for domestic animals as relevant</li> </ul>                                                                                                                                                                                                                                                 | ✓                             |
| <ul style="list-style-type: none"> <li>Reference to other documents if relevant (e.g. frequency and type of fuel reduction, care for on-site water disposal system)</li> </ul>                                                                                                                                                                                    | ✓                             |
| <b>Check-sheets listing activities to be completed on an on-going basis.</b>                                                                                                                                                                                                                                                                                      |                               |
| <ul style="list-style-type: none"> <li>List of Noxious Weeds &amp; Environmental Weeds to be managed/removed.</li> </ul>                                                                                                                                                                                                                                          | ✓                             |
| <ul style="list-style-type: none"> <li>Area of native vegetation and trees to be retained.</li> </ul>                                                                                                                                                                                                                                                             | on map plan                   |

**ENVIRONMENTAL SUSTAINABILITY POLICY FOR PITTWATER**  
**FORM NO. 3 ECOLOGICAL SUSTAINABILITY PLAN**  
**To be submitted with Development Application**

Development Application for MR BOB RICHER  
Name of Applicant

Address of site 15 BORONIA RD, INGLESIDE NSW

*Declaration made by environmental consultant as part of the Ecological Sustainability Plan*

I, ANDRÉ OLSON of DRAGONFLY ENVIRONMENTAL  
(Insert Name) (Trading or Company Name)

on this the 31.07.03  
(Date)

certify that I am an environmental consultant/bushland consultant as defined by the Environmental Sustainability Policy for Pittwater and I have:

**Please mark appropriate box**

- ☒ Visited the site.
- ☒ Consulted and relied upon findings and conclusions from all relevant reports in particular the Ecological Impact Assessment.
- ☒ Completed the Ecological Sustainability Concept Plan (Map) as per Pittwater Council Environmental Sustainability Policy and filled in Form 3a and attached it to the inside front cover of the Report.
- or
- ☒ Completed the Ecological Sustainability Plan (Map and Report) as per Pittwater Council Environmental Sustainability Policy and filled in Forms 3a and 3b and attached them to the inside front cover of the ESP Report.

**Ecological Sustainability Plan Report Details:**

|                                                      |
|------------------------------------------------------|
| Report Title: <u>BUSHLAND MANAGEMENT PLAN</u>        |
| Report Date: <u>31.07.03</u>                         |
| Report Reference:                                    |
| Author: <u>ANDRÉ OLSON</u>                           |
| Author's Affiliation: <u>DRAGONFLY ENVIRONMENTAL</u> |

I am aware that the Ecological Sustainability Plan, prepared for the above mentioned development is to be submitted in support of a Development Application and will be relied on by Pittwater Council to assess potential impacts of the development on the ecology of the site and surrounds. The life of the development is taken as at least 100 years unless otherwise stated and justified.

Signature A. Olson

Name ANDRÉ OLSON

Chartered Professional Status B.Sc. (Ecology Science)

Ref: Interim Environmental Sustainability Policy for Pittwater

# BUSHLAND MANAGEMENT PLAN

15 Boronia Road, Ingleside NSW

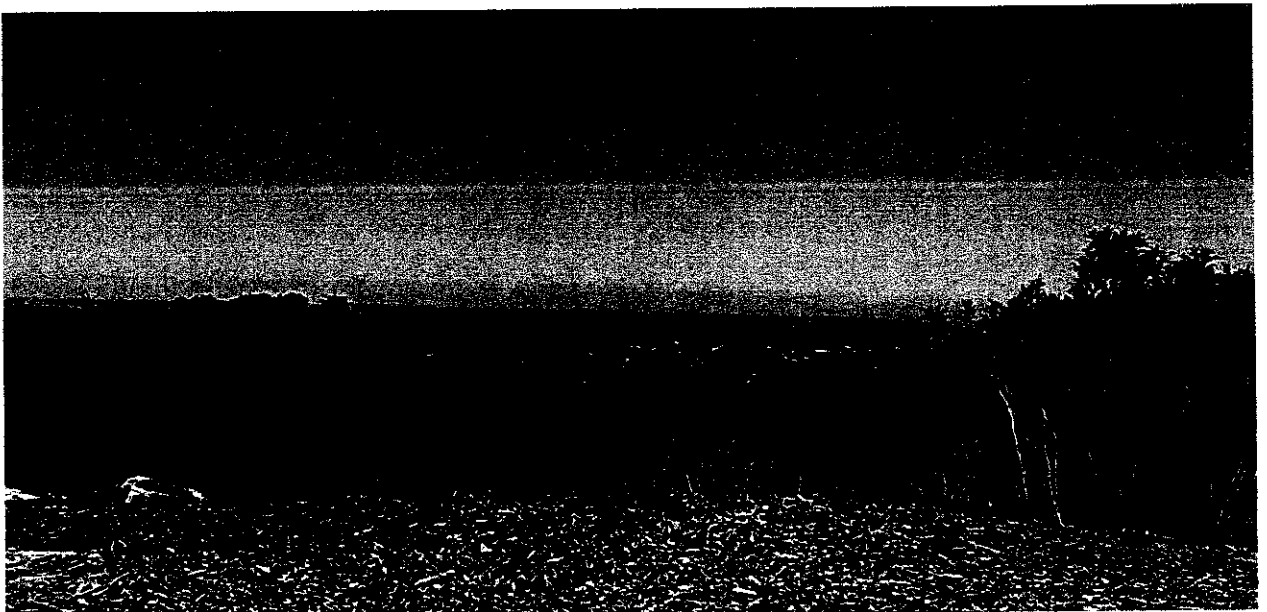


Plate 1. View of site from Boronia Road October 2002



**August 2003—Dragonfly Environmental  
Environmental Consultants  
ph/fax. (02) 9918 4486**

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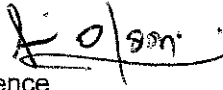
#### Limitations Statement

The purpose of this report is to compile a Bushland Management Plan for 15 Boronia Road, Ingleside in accordance with the requirements of Pittwater Council DCP 25. The scope of services were as per DCP 25 and by the time and budgetary constraints imposed by the Client.

#### Statement of Authorship

This report: **Bushland Management Plan—15 Boronia Road, Ingleside** and the study described herein were undertaken by contract by Dragonfly Environmental. The principle author of the report is André Olson whose qualifications are BSc. The author was involved in the Flora/Fauna impact assessment study undertaken in 1998 and visited the site again in October 2002 and July 2003.

Information presented in this report is based on an objective study based to site visits, previous work in the Ingleside area, associated reports by other consultants (Flora and Fauna Impact Study and On-site Waste-water Report). Opinions expressed in this report are the professional, objective opinions of the author and are not specifically intended to advocate any particular proposal or pre-determined position.

Signature of Principle Author   
André Olson (BSc) Aquatic Science

#### Purpose of the document

This Bushland Management Plan is to aid the owners of 15 Boronia Road, Ingleside manage their property and immediate surrounds in a way that maximises the long-term ecological viability of the site and surrounds.

The plan is required because the property and surrounds are

- (i) known habitat for Red-crowned Toadlets
- (ii) mostly pristine heath and open woodland communities
- (iii) habitat for threatened plant and animals species
- (iv) part of an identified wildlife corridor with the classification MH (Major Habitat Area)
- (v) classified as Core bushland in the Draft DCP for Biodiversity (Pittwater Council 1998);

Defined as the Blue Hatch Area—this heathland is known for its conservation significance.

The site has been identified as Class D fauna habitat (Pittwater Council).

Class D has the following description:

*Areas which are significant in terms of fauna habitat but can accept low density, strategically located residential development subject to a detailed fauna study which indicates that such development, with a high level of ameliorative measures designed to retain or improve habitat, can be applied to ensure the continued viability of fauna populations, and should be preserved."*

## **1 CURRENT STATE OF THE SITE**

### **1.1 Location**

The site is 15 Boronia Road, Ingleside, in the Pittwater LGA (hereafter referred to as 'the site'). See Flora Fauna report for location description including reference to neighboring reserves. Surrounding area is Bushland as defined in SEPP 19—Bushland in Urban Areas.

### **1.2 Site Description**

Close to the ridge-top the site is underlain by Hawkesbury sandstone. Soils are sandy and shallow. Currently the site is Bushland, the rear ¾ of the site are in pristine condition. The front ¼ is disturbed (see Skeleton & Burcher 2002, Plate 1 and Map from DCP 25). The site is mapped as all core bushland in DCP 25, however the front portion of the site is cleared and in its current state would be classified as cleared within Core Bushland.

The proposed house and associated works are described in the Development Application submitted to Pittwater Council (2002). In general the proposed development is a house, porous drive, water tanks and on-site waste water system. The potential impacts of these works on the flora and fauna of the site and surrounding bushland are described in the Flora and Fauna Report (2002).

This updated BMP is based on previous reports and two site visits in July 2003.

A bush fire consultant was present on the last site visit 31.07.03 and reviewed the recommendations outlined in this plan. In short, the asset protection zone and the two areas of vegetation to be retained do not compromise the effectiveness of the asset protection zone or the safety of the dwelling at the time of the site inspection. For full report refer to Appendix 1.

### **1.3 Bushland Vegetation**

#### **1.3.1 Native Species**

High diversity health grading into Woodland see Flora Fauna Report for species list.

### 1.3.2 Major trees on the site

Trees on the site are important general habitat for fauna. However, there are no trees of individual high conservation significance.

### 1.3.3 Importance to Fauna

As per Flora and Fauna impact study. In summary the site is of importance to Red-crowned Toadlets a threatened species. Surrounding heath is important to other threatened and endangered species.

## 2 PROTECTION OF EXISTING VEGETATION/NATURAL FEATURES

### 2.1 Protection Fencing

Fencing is to be a minimum of star pickets with bright colored protection mesh.

- /// Fence off all bush land areas outside APZ as per Plan 1 shown in pink (29.07.03)
- /// Fence off trees within APZ area as per Plan 1
- /// Fence off bushland within APZ and conduct hazard reduction on this vegetation. Understorey sedges/rushes to be kept, over-storey species are to be cut to 1-1.5m tall. Leave some vertical stems for bird habitat. All cut material must be gathered and removed from site. This section is to be made weed free and retained weed free for the life of the development.

### 2.2 Sediment Fencing

- /// Sediment fencing is to be placed between works and bushland, and between works and vegetation/watercourse being retained within the APZ. Sediment fencing is not to be removed until all works are complete and land is stabilised. Areas requiring fencing are shown in purple dashed line on Plan 1.

### 2.3 Natural Features

- /// All exposed sandstone is to be retained *in situ*. Sandstone surfaces are not to be damaged by machinery etc. Exposed sandstone is to be fenced until works are completed. If any archeological/Aboriginal markings etc. are discovered at any time these are to be reported to Council and National Parks and Wildlife.

## 3 VEGETATION MANAGEMENT

### 3.1 Vegetation Management in APZ

- /// Only one area requires further clearing. This is located on the eastern boundary adjacent to Lot 32. Clearing is not to be outside the subject site, this area is shown on the Plan 1 and is referred to as managed bushland. Vegetation here is to be brush cut to 200mm cut material must be collected and removed from the site. This area is to be maintained and kept as low vegetation. A dry sandstone wall or equivalent fire/heat retarding fence is to be erected along the boundary with Lot 32 (as per recommendation for fire management).
- /// The APZ zone is to be planted out with non-invasive grass (not Kikuyu), preferably native. Regeneration of native heath plants is desirable, providing they are kept in discontinuous clumps and brush-cut.
- /// Grass planting over the transpiration zone is discussed in this report. In summary it is to be *Paspalum distichum*, native water couch (readily available as turf from suppliers).

- /// Invasive plants are not to be planted, and noxious weeds are to be controlled at all times, even if they have moved from the property onto surrounding land.

### 3.2 Existing wetland

The existing wetland is 30m<sup>2</sup> (6m x 5m). *Gahnia melanocarpa* and other wetland species dominate the existing wetland (refer to Plate 2). This is an important habitat area and must be **retained for the life of the development**. The wetland area is Hazard management can be achieved by cutting over-storey to 200-600mm high. Some stems should be retained as bird habitat. Water loving species should be encouraged to spread from this area into the waterway and pond.

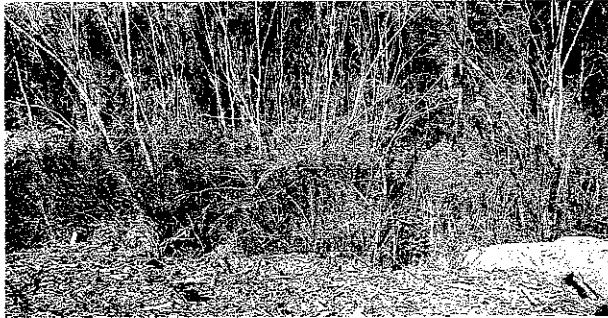


Plate 2: Existing wetland to be retained for the life of the development. Wetland and wet soak area are prime habitat and important for the life history of the threatened Red Crowned Toadlet. It is recommended to planted out wet soak areas with recommended plants listed in Table 1

### 3.3 Landscaped Areas

The objective for landscaping in this Blue Hatch area is:

*"...reinstate elements of the natural environment, and maintain and enhance the natural character and environment of the area."* (Pittwater Council 1994).

#### 3.3.1 Species to be planted

##### Terrestrial species

Planting is to be at least 80% locally native species. Grown from local seed (suppliers details see Appendix I, there may be other nurseries that do this as well and it is recommended that the owners of the site follow this up. Any species that are not from the local area must be non-invasive. Non-invasive in this case means *will not spread into surrounding areas by growth, seeds or any other means. It also includes the spread of genetic material via hybridisation with locally native species.* For example many hybrid species of *Grevillea* (Spider Flowers) sold in nurseries will hybridise with local species.

### 3.4 Vegetation outside the APZ

Vegetation outside the APZ is bushland and is an Environmental Protection Zone (EPZ) for the life of the development. Development is not permitted in this area. Degradation of this area could result in making the Occupation Certificate invalid.

/// Saturate with water immediately then allow to drain. Keep moist for the first few weeks.

## 4 RED-CROWNED TOADLET HABITAT

### 4.1 Channel

Vegetate the remainder of the cut channel leading to the pond with a selection of species in Table 1. Refer to location column in Table 1 as to whether the plant will prefer to grow on the edge, instream or in a saturated soak area.



Plate 3. Channel to be battered back and replanted



Plate 4. Channel leading to pond

### 4.2 Pond

1. Hand remove *Isolepis prolifera* (Plate 5) and Arum Lily (Plate 6) from pond area. The site is the top of the catchment and both plants are invasive. It is important to remove these plants before they spread.
2. Batter the edges of pond (grade of 1:4) using a shovel or equivalent (refer to Cross Section A, Figure 1).



Plate 5. *Isolepis proliferata* to be removed



Plate 6. Arum lily to be removed

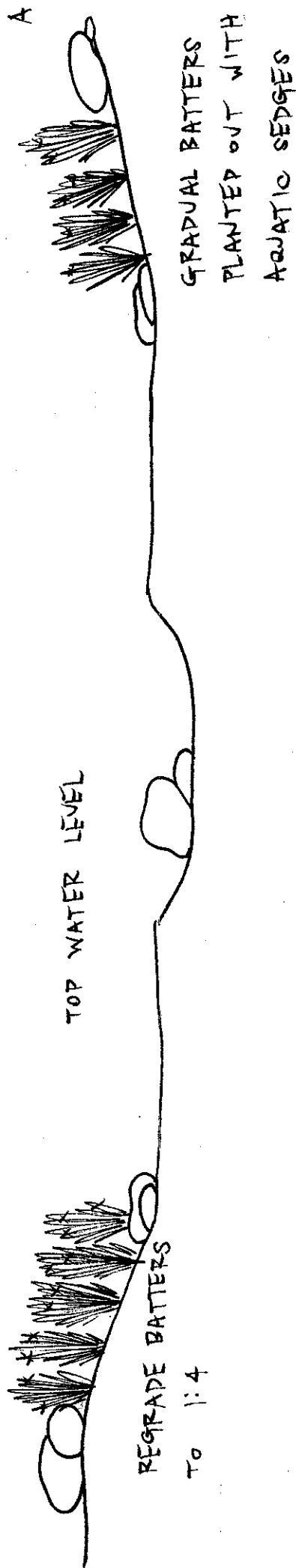
3. Pond batters are to be vegetated with sedges and ferns. Plants are to have a minimum density as per Table 1 (below). Pond batters are to be planted with at least 120 plants and comprise of at least five different species from Table 1. The pond floor is to be planted with at least 20 sedge plants from at least two different species.

#### 4.3 Ephemeral Creek/Marsh

- /// Make the current flow path into a shallow bedded waterway with intermittent shallow marsh zones separated by sandstone weirs (refer to Cross Section B, Figure 1). These are soft engineering works and only require a spade/shovel to batter the existing flow path, careful use of a small machine is permitted for placement of sandstone.
- /// Utilise sandstone rocks to define edge of waterway and to prevent scouring and erosion. Sandstone is not to cover the creek bed as this is to be densely planted (refer to Table 1 for species selection). Sandstone along the edges of the waterway is not to exceed 50% cover. Areas without stone will be densely planted.
- /// Ephemeral creek batters are to be densely planted with at least 250 plants and comprise of at least five different species from Table 1.
- /// The Ephemeral creek/marsh zone is to be planted with at least 350 sedge plants from at least five different species (refer to Cross-section B, Figure 1).

CROSS SECTION A OPEN POOL AREA.

A



CROSS SECTION B MARSH ZONE

B



EPHEMERAL CREEK/MARSH ZONE. DENSELY PLANTED OUT FOR  
FROG HABITAT.

**Table 1: Plant List for Wet Areas**

|               | Plant                                | Location                                        | Planting Density (m <sup>2</sup> ) |
|---------------|--------------------------------------|-------------------------------------------------|------------------------------------|
| <b>Ferns</b>  | <i>Blechnum ambigum</i>              | Soaks, Damp Ground, At or above Top Water Level | 4                                  |
|               | <i>Blechnum cartilagineum</i>        | Soaks, Damp Ground, At or above Top Water Level | 6                                  |
|               | <i>Hypolepis muelleri</i>            | Soaks, Damp Ground, At or above Top Water Level | 6                                  |
|               | <i>Histopteris incisa</i>            | Soaks, Damp Ground, At or above Top Water Level | 6                                  |
|               | <i>Calochlaena dubia</i>             | Soaks, Damp Ground, At or above Top Water Level | 6                                  |
|               | <i>Gleichenia dicarpa</i>            | Soaks, Damp Ground, At or above Top Water Level | 6                                  |
|               | <i>Sticherus flabellatus</i>         | Soaks, Damp Ground, At or above Top Water Level | 6                                  |
|               | <i>Todea barbara</i>                 | Soaks, Damp Ground, At or above Top Water Level | 6                                  |
| <b>Sedges</b> | <i>Juncus planifolius</i>            | In-stream, floor of ponds, on edge of bank      | 8                                  |
|               | <i>Juncus continuus</i>              | In-stream, floor of ponds, on edge of bank      | 6                                  |
|               | <i>Carex appressa</i>                | In-stream, floor of ponds, on edge of bank      | 6                                  |
|               | <i>Caustis reflexuosa</i>            | Edge of Bank, soaks, overflow zones             | 6                                  |
|               | <i>Cyathochaeta diandra</i>          | Soaks, overflow zones                           | 6                                  |
|               | <i>Ghania melanocarpa</i>            | Soaks, overflow zones                           | 6                                  |
|               | <i>Lepidosperma laterale</i>         | Soaks, overflow zones                           | 6                                  |
|               | <i>Leperodia scariosa</i>            | Soaks, overflow zones                           | 6                                  |
|               | <i>Restio</i> spp. (Ingleside stock) | Soaks, overflow zones                           | 6                                  |

## **5 ON-SITE WASTE WATER DISPOSAL**

### **5.1 Wastewater treatment and disposal**

#### **5.1.1 Location and Bund Wall**

The Disposal area is to be as close to the front of the property as possible (proposed changes to location see Plan). A bund wall is to be built around the lower edge of the system to minimise overland flow of waste-water (as shown on Plan 1 29.07.03). On-site waste-water disposal has a high potential to degrade bushland downslope of the system.

#### **5.1.2 Location of Transpiration Zone**

The transpiration zone has been modified. It is to be moved away from the rear boundary, and equivalent area located on the site as per Plan 1. The transpiration zone must be as far away as possible from watercourse and bushland because it will cause weeds to flourish and pollute natural watercourses on the site and down stream.

#### **5.1.3 Planting and weeding over the disposal zone**

The disposal zone is to be planted with native lawn (Native Couch Grass) *Paspalum distichum*. This can be obtained as turf from a number of nurseries including Abulk. Kikyu is not to be used. Weeds occurring on or around the disposal area are to be managed at all times. Weed species are not to be allowed to enter the bushland. Weeds are to be kept out of bushland areas for the life of the development.

#### **5.1.4 System Maintenance**

Any system that is put in place is to be regularly maintained recommendations given in the Waste-water Report regarding avoiding phosphate containing soaps, detergents etc and toxic substances such as chemical drain clearer.

Details regarding the type of wastewater treatment and disposal system are discussed in the Waste-water Report 2002. The proposed system must include a polishing system such as a biofiltration unit that reduces Phosphorous and Nitrogen. Such a system limits nutrient rich water leaving the detention area in the future. Any system that is put in place is to be regularly maintained recommendations given in the Waste-water Report regarding avoiding phosphate containing soaps, detergents etc and toxic substances such as chemical drain clearer. If the system appears to be failing (i.e. releasing nutrients into the bushland and effective bushland or water quality the system is to be modified to stop deleterious effects. The site is to be connected to the sewerage system as soon as it is available.

## **6 WEED PLANT SPECIES**

### **6.1 Currently on the site**

Weeds are growing along the path of a polluted water plume from on-site waste-water systems of the adjacent properties. The remainder of the site is 99% weed free. Species recorded are listed below. Pampas Grass and Lantana are noxious weeds and active and constant suppression is essential if the surrounding bushland is to keep its integrity.

The following introduced species are on the site but have been 90% killed.

| Species name                    | Common name         | Status & Abundance    |
|---------------------------------|---------------------|-----------------------|
| <i>Bidens pilosa</i>            | Devil's Pitchfork   | Intro. Weed ##        |
| <b><i>Lantana camara</i></b>    | <b>Lantana</b>      | <b>Noxious W2 ###</b> |
| <i>Crocosmia crocosmiiflora</i> | Crocosmia           | Intro. Weed ##        |
| <i>Eupatorium adenophorum</i>   | Crofton Weed        | Intro. Weed ##        |
| <b><i>Cortaderia sp.</i></b>    | <b>Pampas Grass</b> | <b>Noxious W2 ##</b>  |

#one or two recorded on the site, ## common on the site in the disturbed area, ### abundant on the site in the disturbed area. Species in **bold** are classed as Noxious (Noxious Weeds Act 1993-see Appendix I.

### Noxious Weeds

Two species classed as a noxious weeds are/were growing on the site.

Pampas Grass and Lantana. Both are classed W2 weeds thus they must be: *fully and continuously suppressed and destroyed* (Noxious Weeds Act 1993).

### Action to be taken

The owner has been removing all noxious weed species from the site however the neighboring on-site waste-water systems should be upgraded ASAP to stop the cause of the weed plume. The owners of the polluting systems should be made to contribute financially to the weed suppression on the site until nutrients from their on-site systems are reduced so that they do not result in excessive weed growth. Neighbors should remove Noxious Weeds from their properties particularly from the boundaries with other properties/bushland.

#### 6.1.1 Non-problem introduced species growing on the site

None were identified on the site. Some non-invasive non-indigenous species may be suitable for growing close to the house however all species not native to the local area should be checked by a person with sufficient knowledge about the species and local flora.

#### 6.1.2 Edge effects

Any disturbance impacts on not only the area but the surrounding area. This is known as an edge effect and much research has been done on this. Weed encroachment is one of the main edge effects (Bennett 1999 and Bennett *et al* 1998). It is commonly accepted that edges can not be kept free from weeds without constant maintenance, especially in urban areas. Weed domination along the edge of surrounding roads is clearly apparent and without management weeds will grow along the drive to the house. Regular maintenance of plants along the drive and other disturbed areas will keep weed establishment to a minimum.

#### 6.1.3 Aquatic weeds

The only location for aquatic weeds to establish on the site is in the proposed storm water detention area. Aquatic weeds that could establish in the stormwater detention area will not be able to grow in surrounding terrestrial habitats they could however be transported to natural wet areas by birds. The most problematic aquatic weeds that could grow in the wet areas on the site are:

- *Salvinia*, *Salvinia molesta*;
- Water Hyacinth, *Eichornia crassipes* (sometimes sold in nurseries); and
- Parrots Feather, *Myriophyllum aquaticum* (sometimes sold in pet shops).
- *Isolepis prolifera*

It is very unlikely that the first three species will establish in the detention area. The first two species are declared Noxious and as such must be vigorously and consistently suppressed. All could be controlled manually due to the small size of suitable habitat. The fourth weed *Isolepis prolifera* is just beginning on the property. This plant can be removed by hand pulling, or gently lifting roots from ground with a lever. Stems should be placed in a bag as they can continue to grow from plant material left on site.

If any plant is found that is suspected of being a weed either send the specimen to the councils weed officer or the Royal Botanic Gardens, Sydney or Sainty and Associates—wetland specialists (02) 9332 2661. Alternatively weeds may be identified in *Waterplants In Australia* by Sainty and Associates, available on loan from Mona Vale Library and the Coastal Environment Center (Narrabeen Lake).

## 6.2 Weed Identification and Removal techniques

### \*Cautionary Note

*The use of herbicide near on in the waterway/damp soaks is not allowed. Many aquatic invertebrates, frogs, mollusks and crustaceans are herbicide sensitive, and can be negatively impacted upon if herbicide is administered inappropriately.*

The cause of the existing weed plume should be controlled (Waste-water systems on adjacent land). Plate 7 shows entry area for nutrient rich water and recently cleared weed species.



Plate 7. Downslope of waste-water systems (adjacent properties). Weeds species surrounding natives (Bottlebrush and Cheese Tree).

Weed control measures as stated in Pittwater Council's Urban Bushland Plan of Management, (1996) are to be referred to along with the following information.

### 6.2.1 Lantana, *Lantana camara*

*Growing along the line taken by the waste-water from adjacent property. Most has been kill/removed by the client. Follow up work, by hand, will be required where seeding and re-shooting occur.*



Plate 8. Lantana on neighbouring property.

Rambling shrub to about 4m. Lantana has prickly stems and clusters of orange and yellow small flowers. Fruit is a green berry that hangs in a cluster. Problem plant that smothers native vegetation and changes community structure for plants and animals.

#### Dispersal

Seeds are eaten and dispersed by birds. Also spread quickly by re-growing from cut stems.

#### Control

Cut stems and dig out base or paint freshly cut stem with Glyphosate. Where possible burn stems (with permission) or pile away from ground/moisture as stems can re-shoot. Biological control is not suitable for the site.

Areas where Lantana has been removed should be re-vegetated or covered as soon as possible. A suitable cover is crushed sandstone (~\$15/m<sup>3</sup> from Benedicts Quarry Belrose). Natural regeneration of surrounding native species will occur through/over sandstone. Other forms of mulch can carry weed seeds and provide a nutrient layer that generally favors weeds over natives. Once the plants are removed control of seedlings by hand pulling is easy providing it is done regularly.

### 6.2.2 Pampas Grass, *Corteria jubata*

*Removed from the site but growing on adjacent property (one seed head present-Plate 7).*

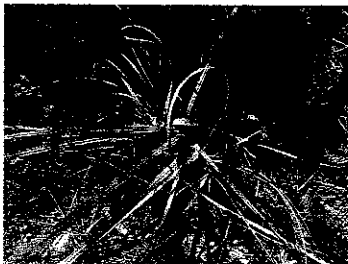


Plate 9. Young Pampas Grass (roadside ~ 100m from site)

A tussock-forming grass growing to 4 m in height. Strap-like leaves grow to 2 m. Stems are hollow and hold a 'fluffy' plumed flowerhead. Flowerheads are pink to beige and can be almost 1 m long. Plants were flowering in July.

NB Young Pampas Grass looks similar to the native *Gahnia* spp. a native plant important in the area and growing on the site. *Gahnia* generally has leaves growing off stalks whereas Pampas Grass generally grows as a clump from the base (have specimens checked if unsure).

**Method of Dispersal**

Seed are spread easily by wind and plant parts can spread vegetatively.

**Removal**

Flower heads should always be removed as soon as they are seen. Flowerheads must be bagged in a long-lasting bag, or burnt. Once Flowerheads have been removed Pampas Grass can be controlled with applications of Glyphosate. Non-chemical control involves the removal of the flowerheads, then leaves, then removal of the crown by slicing or sawing below the foliage. Plants may grow back and removal of entire plants is sometimes necessary.



Plate 10. Mature Pampas Grass (and other weeds) on adjacent property, one seed head—most seeds have already dispersed.

**6.2.3 Privet**

Privet was growing on the site has been removed by Client. Follow up work will be required to remove any seedlings. Privet is easily controlled by hand pulling seedlings. Seeds usually only last 1 year in the ground.

Native Cheese tree (growing on the site) looks similar to Privet.

**Distinguishing features**

|        | <b>Cheese Tree</b>                           | <b>Privet</b>        |
|--------|----------------------------------------------|----------------------|
| Leaves | Glossy                                       | Matt                 |
| Fruits | Yellow-cream compressed disc with wavy edges | Dark spherical fruit |

**6.2.4 Devils Pitchfork, *Bidens pilosa***

An annual plant that grows up to around 1.5–2 m tall. Sticklike in appearance, with numerous flower heads, yellow approximately 7mm across. Balls of seed form from flowers. Each seed is about 1 cm long and 1 mm wide with barbs on the out end. Seeds easily stick to animals including humans and are transported into bushland.

**Dispersal**

Seeds easily stick to animals including humans and are transported into bushland.

**Control**

Bag the plant to avoid being stuck by seed then pull out roots (hand pulling easy).

**6.2.5 Fleabane, *Conyza bonariensis***

Nearby—along roads—but not yet on the site.

Sticklike weed to around 1m tall. Leaves are concentrated at the top of the stem. Flowerheads are on the top of the plant, beige and feathery on maturity.

**Dispersal**

Seeds are dispersed by wind.

Control

- Bag flower heads
- Pull whole plant from the ground, wetting soil makes removal easier.

6.2.6 Yellow Daisy, *Coreopsis lanceolata*

Nearby but not yet on the site.



Plate 11. Yellow Daisy,  
*Coreopsis lanceolata* growing  
~50m from the site.

Yellow Daisy, *Coreopsis lanceolata* is a weed species that would be a direct threat to the long-term survival of native species on the site. The Yellow Daisy is a vigorous grower and prolific seeder it quickly colonises areas and becomes dominant to the exclusion of native species (as can be seen along the Wakehurst Parkway). *Coreopsis lanceolata* should be removed from the site as soon as it is seen.

Method of Dispersal

Spreads from runners that grow from tap roots.

Removal

Remove whole plant including taproot and runners

6.2.7 Cotoneaster, *Cotoneaster glaucophyllus*

New plants are establishing in disturbed areas close to but not on the site.

A large shrub growing to about 4 m, easily recognised by its bright red berries.

Method of Dispersal

Seeds are eaten and dispersed by birds. Pied Currawongs are usual vectors in Pittwater. Cotoneaster is food for this species and increasing the breeding success of Currawongs. Currawongs are known to have higher densities in urban areas and prey on small birds and nestlings—thus removal of this plant is important.

Cotoneaster can re-shoot from cuttings.

Control

Manual removal is best particularly as the plants are currently small. Chemical control can be used—cut the tree at base and apply a woody weed or tree killer substance.

6.2.8 *Crocasmia*, *Crocasmia x crocosmiiflora* and *Gladiolus*

Growing on adjacent property downslope of waste-water plume.

Bright green leaves growing in clumps. Flowers bright orange arranged along a 'stem'.

Dispersal

Both species disperses via corms (underground swellings) that multiply rapidly. Also spreads via seed.

Control

Remove flowers before seeding and dig whole plant from the soil.

#### 6.2.9 Black-eyed Susan, *Thunbergia alata*

*Not yet on the site but within 100m and this species is invasive.*

An attractive plant, occasionally grown in gardens. The vigor of this species makes it unsuitable in many areas particularly where there is bushland. Black-eyed Susan is a climber to about 3 m tall.

It can and does grow up and over shrub species smothering them. Where Black-eyed Susan establishes it reduces the structural diversity of vegetation which is a reduction in habitat space for native fauna species. Many of the shrub plants that get smothered are flower species that native birds feed from.

##### Dispersal

Black-eyed Susan can root at the nodes and hence travel underground and shoot up new plants away from the parent plant. It can also grow from broken plant pieces.

##### Control

Manual removal is most effective. All parts of the plant are to be removed and placed in a bin or bag. The root mass has to be dug out. Thick mulch is recommended to deter re-growth. Re-growth should be removed (including from underground) as soon as it is sighted.

#### 6.2.10 Crofton Weed, *Eupatorium adenophorum*

Crofton weed has recently spread onto the site

##### Control

Manual removal is most effective. All parts of the plant are to be removed and placed in a bin or bag. Re-growth should be removed as soon as it is sighted.

#### 6.2.11 Turkey Rhubarb Vine, *Acetosa sagittata*

Turkey Rhubarb has been introduced onto the site from the imported forest mulch. It is growing in area where the mulch has been spread. This is an invasive weed and should be identified and controlled ASAP.

##### Control

Manual removal of this weed is recommended. The plant has an underground storage tuber, and this must be dug out and removed. A legal herbicide may also be employed if an infestation occurs on site.

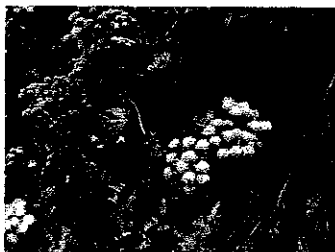
#### 6.2.12 Other weed species

Other species that have been observed within 100 m of the site are listed below. Bush managers need to be familiar with these species. If any of these plants are located on the site or surrounds all efforts should be taken to eradicate them. Early detection and control is the most effective. Details on control methods for these species can be found in books in the reference list or in a Bush Regeneration Manual.

**Other species recorded close to the site.**



A. Honeysuckle



B. Crofton Weed



C. Whisky Grass

- Honeysuckle (see A)
- Crofton Weed, *Eupatorium adenophorum* (see B).
- Turkey Rubarb Vine, *Acetosa sagittata*
- Morning Glory, *Ipomoea indica*
- Broadleaf and Small-leaf Privet, *Ligustrum lucidum* & *L. sinense*
- Formosan Lily, *Lilium formosanum*
- Fishbone Fern, *Nephrolepis cordifolia*
- Rhus Tree, *Toxicodendron succedaneum*—(DO NOT BURN this plant, as the smoke from the wood is toxic)
- Canna Lili, *Canna indica*
- Impatiens, *Impatiens balsamina*
- Whiskey Grass (yellow grass common along the road see C)
- Wattle from WA *Acacia saligna* common on road sides (thick green leaves with 1 vein in the middle of leaf) get ID checked if not sure.

Plate 12. a,b,c.

### 6.3 Frequency of work

#### 6.3.1 Weed removal—existing weeds.

Considerable work has already been undertaken by the owner of the property. Further work includes suppression of re-growth by:

- piling/removing Lantana,
- cutting and painting Lantana stumps with herbicide where appropriate (where they can not be removed without disturbing adjacent vegetation).
- hand removal of seedlings of all weed species.

If these species grow again—which is likely—on-going work is required. It is suggested that 20 hours be spent on follow up manual suppression with a follow up 8 hours three weeks later. After initial work, weeding will be required at least four times per year. Frequency will decrease once the source of water and nutrients is better managed on up slope of the site.

### 6.3.2 Weed removal—potential weeds.

Weeds will continue to establish in the nutrient rich run-off zone (from adjacent properties). Further the proposed on-site waste-water system for this site may have periods of failure where nutrient rich water seeps from the disposal area. Even a system in good working order has a limited capacity to hold nutrients, particularly phosphorous, over time, hence weeds will establish in areas around the proposed on-site system. Frequent removal of weeds will be required as soon as weeds start to grow. Checks of the system to ensure it is working (as per waste-water report) are essential.

The status of weeds should be recorded at least twice-yearly.

### 6.4 Who should do the work

Anyone who can identify weed species and has practical knowledge of the correct removal and disposal techniques. Preferably the person(s) would have done a course in Bush Regeneration. Courses are run at T.A.F.E colleges.

### 6.5 Recording sheets

At each of the site inspections the following should be recorded:

- weed species location;
- abundance on the site are to be recorded at the initial and subsequent inspections and;
- where weeding has been done and how well the control methods are working.
- The recording sheet—Appendix III—can be photocopied and used as a template.

## 7 ANIMALS

### 7.1 Native animals

Species known to occur on the site are listed in the Flora and Fauna reports (Skeleton & Burcher 2002 and Dalby-Ball *et al* 2000) and include a number of species of possums, birds and reptiles. Fauna of conservation significance that may use the site and surrounding bushland are listed in Appendix II) and include:

Pygmy Possum—*Cercartetus nanus*—rare and locally significant

Long-nosed Bandicoot—regionally significant terrestrial mammal;

Heath Monitor—*Veranus rosenbergi*—Endangered Species:

Long-nosed Bandicoots (Regionally Significant) and Southern Brown Bandicoots (Endangered)

Micro-bats, listed as Vulnerable, may visit the site to feed upon blossoms/insects.

Frogs Red-crowned Toadlets (on the site) and Giant Burrowing Frogs are expected on the down slope site.

#### 7.1.1 Habitat for native animals

##### Nesting boxes

No tree hollows were observed on the site. Trees with hollows do occur in open woodland downslope of the site. Hollows are very important habitat for birds, particularly parrots and arboreal mammals. Many animals that are now considered Threatened or Endangered are reliant on tree hollows for living and or raising young. Nesting boxes can be placed in trees to increase habitat for these animals. Nesting boxes can be monitored by the owners to determine what species are using them. Two nesting boxes could be placed on the site. Attachment would be to a rough barked tree. Boxes should be at least 3m from the ground.

Nesting boxes are made from wood. Entrance hole size would vary depending on which animals the boxes are being designed for. We recommend entrance holes of 4–8cm in diameter and placed on the side of the box at the top. Box size can vary. Gliders and Owls are thought to prefer long hollows, up to a couple of feet long. Box attachment is usually by rope, secured around the tree trunk and around a branch. Details on designs for nesting boxes can be found at [www.birdsaustralia.com.au/infosheets](http://www.birdsaustralia.com.au/infosheets) and see (Christensen 1988, Philipps 2000 and references therein). Boxes should be monitored to ensure undesirable species, such as Indian Mynar Birds and non-native Bees are not using them.

Dense mid-tall heath is utilised by many small bird species for nesting. The proposed lowering of this vegetation (for fuel reduction purposes see Flora/Fauna Report) will result in loss of some nesting habitat. Try to carry out fuel reduction activities in winter, outside the breeding season for most birds, and check plants for nests before cutting. Aim to keep bands of vegetation so that patches of habitat do not become isolated.

#### **Ground cover**

The current natural covering of leaf litter, rock outcrops and fallen logs provide habitat for invertebrates, frogs and reptiles. For the longevity of the site's Bushland ecosystem the invertebrates and associated organisms must be able to persist. Leaf litter is to be maintained in areas not directly affected by the development including the fuel reduced/fuel free zone. Around the house leaf-litter can be reduced to a level that it does not pose a fire problem.

## **7.2 Potential Problem Animals and Management Techniques**

### **7.2.1 Mosquitoes**

Mosquitoes will breed in areas of fresh, still, open water. The proposed stormwater detention areas is potential breeding area for mosquitoes. Mosquitoes can be controlled by having native predators such as dragonfly larva and native locally native crustaceans. Insectivorous bats feed on mosquitoes and these bat species are in the area.

Periodic drainage of the detention area will aid in mosquito control. Prior to emptying, water should be allowed to evaporate naturally from the basin for as long as practical.

### **7.2.2 Mosquito Fish (*Gambusia* spp.)**

Mosquito fish *Gambusia* spp. must be immediately killed if they enter the basin. These fish have been listed as a Threatening Process on the Threatened Species Conservation Act (1995) because of their predation on tadpoles and native fish. Mosquito fish (*Gambusia* spp.) to be introduced to the detention basin.

### **7.2.3 Cats and Dogs**

Habitat trees for arboreal mammals do occur within 300 m of the site and terrestrial native species occur on the site. For the protection of all native animals **it is essential that cats are excluded from the site and dogs are restrained from entering areas of wildlife habitat.** If cats from neighboring properties are seen entering Bushland the cat's owner should be notified by other residents or by Council. If a cat is not restrained from entering Bushland the owner of the cat can be fined. If the owner can not be identified the cat may be killed.

**It is essential that dogs and cats are kept out of all bushland as they will attack and kill Heath Monitors and Southern Brown Bandicoots—both species are Endangered and have isolated populations in the Ingleside area.**

## 8 WATER

Changes to the water regime can degrade bushland in the following ways:

- /// Increased water can cause changes to the composition and abundance of soil invertebrates and fungi.
- /// Increased soil moisture can increase the susceptibility of plant roots to fungal infestation (root rot).
- /// Increased soil moisture can decrease plants ability to exchange gasses in the roots leading to inefficient breakdown of materials and cell death.

### 8.1 Stormwater Run-off from the house and associated structures

Stormwater run-off from the property will be directed into the water tank on the site and hence is not expected to be an issue. In times where there is excessive water the sandy soils will allow the water to leave the site quickly. Any future changes to the development must ensure water leaving the site is free from contaminants and run off is in a sheet flow rather than concentrated in a way that causes excessive erosion.

### 8.2 Over-land flows

Stormwater from Boronia Road is not adequately managed and should be dealt with by the RTA/Council. Currently water is draining onto the site from the road and the adjacent property. A stormwater swale has been recently created to drain water off the site and direct it to an ephemeral pond (refer Flora and Fauna Report).

This stormwater swale must be stabilised and planted ASAP (see Plate13). Hesion, coir, mulch mat or similar material should be used to line/stabilise the banks. Plants, particularly *Juncus* spp. should be planted into banks through stabilising material.



Plate13. Stormwater drainage ditch leading to wet/dry pond area.



Plate 14. Stormwater drainage ditch showing weed plume and slope where water drains onto the site.

Frogs are likely to come to the drainage swale and pond. Likely species include the Striped Marsh Frog. Red-crowned Toadlets may breed in or close to the detention area if it is vegetated

appropriately. Dense vegetation and rocks with under-shelves should be placed around the pond to provide a day refuge for frogs. NB rock can not be removed or moved on-site. Removal/disturbance of Bushrock (sandstone) is listed as a Threatening Process NPWS and carries a heavy fine.

## 9 ABORIGINAL HERITAGE

Objective is *"that development does not occur on or impact on any items which may be of significance in terms of aboriginal heritage"* (Pittwater Council Aboriginal Heritage—web page information).

No official records for aboriginal artifacts / special places pertain to the site, however the area is likely to have been used / visited by aboriginal people. If items, engravings etc are located on the site these must be reported to National Parks and Wildlife Service and should be reported to the Pittwater Council Heritage Officer.

## 10 FIRE

Fire management will be one of the greatest impacts on bushland. The fire report (Hoschke 2002) recommends areas for fuel reduction (cutting vegetation to a max of 50cm). Recommendations do not take into account the impacts on Threatened Species. The Flora and Fauna Impact Assessment (Skeleton & Burcher 2002) recommends these areas be minimised as much as possible and for a focus to be on the building materials, siting of structures etc.

The Rural Fire Service is responsible for advising residents of the fire management requirements on the site. Control burning in the area is likely. It is important that burning is no more frequent than ~8-14 years as some of the plant species require this length of time to become mature enough to set seed and/or to produce underground roots/stems (lignotubers), capable of surviving fire.

Requirements of animals must also be taken into account. The Southern Brown Bandicoot is reported to need a mosaic of burnt and unburnt areas. Any control burns must take this and other species into consideration.

Methods for reducing the risk of fire or limiting the spread of fire such as using building materials with low flammability should be carried out.

*Plan First / Planning for Bushfire Protection* (Rural Fire Service 2002) available on the internet needs to be taken into consideration however this document does not take into consideration Threatened Species or long-term ecological viability and a compromise will have to be achieved for the site. NB The Threatened Species Act (see NPWS - on internet) must be adhered to when carrying out activities for fire safety. If unsure check with the Natural Resources Unit at Pittwater Council.

### 10.1 Brushcutting vegetation.

Carryout fuel reduction activities in winter, outside the breeding season for most birds, and check plants for nests before cutting. Taller dead vertical branches / stems are used by a number of bird species during courtship rituals. Birds that do this include the White-cheeked and New Holland Honeyeaters, both live on the site.

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**Fire Consultant's Report**

# Fire Base Consulting

## Building Construction in Bush Fire Prone Areas

ABN - 14 640 865 430

Reference No 31 - 07 - 2003 - 1

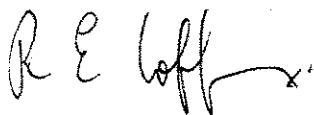
Ron Coffey  
20 Lake Park Road  
North Narrabeen  
Sydney NSW 2101

(02) 99137907 - 0408220443  
[roncoffey@optusnet.com.au](mailto:roncoffey@optusnet.com.au)  
[roncoffey64@msn.com](mailto:roncoffey64@msn.com)

## Bush Fire Report - 15 Boronia Road Ingleside

**For Mr Bob Richer**

The site was inspected on 31st July 2003



Ron Coffey Grad I Fire E  
Graduate Institute Fire Engineers  
Hazard Mitigation Engineer [Bush Fire Prone areas]  
Member Institute fire Engineers

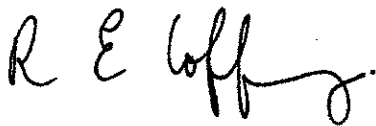
**Subject:** Bushfire report – 15 Boronia Road Ingleside for Mr B. Richer

**Reference:** Planning for Bushfire protection 2001 – Development Application  
NA80602 – Condition of approval No B16

The site was inspected on 31<sup>st</sup> July 2003, at the request of Mr B Richer, to confirm that the proposed asset protection zones conform with the approval conditions of the Development Consent.

The asset protection zone of 30m, as accepted in the development consent, has been cleared of trees, ground fuel and undergrowth with the exception of two small areas of native vegetation. These two areas are approximately 20m<sup>2</sup> and 12m<sup>2</sup> and have been preserved adjacent to a natural water course for flora and fauna issues.

The two preserved areas of native bush in the asset protection zone are of significant importance for the habitat of threatened species and the preserving of these areas does not compromise the effectiveness of the asset protection zone or the safety of the proposed dwelling.

A handwritten signature in black ink, appearing to read 'R E Coffey'.

Ron Coffey Grad I Fire E  
Graduate of the Institute of Fire Engineers  
Hazard Mitigation Engineer [bush fire prone areas]  
Member of Institute of Fire Engineers  
Past Fire Brigade Officer NSW Fire Brigades  
Past Hazard Reduction Officer NSW Fire Brigades

## APPENDIX II

### Animal Species of Particular Conservation Significance

Species that could occur on/near 15 Boronia Rd Ingleside.

| Common Name                  | Scientific Name                | Status in Pittwater             | Status in NSW |
|------------------------------|--------------------------------|---------------------------------|---------------|
| Eastern Pygmy Possum         | <i>Cercartetus nanus</i>       | R locally significant           | -             |
| Eastern Quoll,               | <i>Dasyurus maculatus</i>      | O                               | V             |
| Long-nosed Bandicoots        | <i>Permeles nasuta</i>         | R regionally significant        | -             |
| Southern Brown Bandicoots    | <i>Isoodon obesulus</i>        | E                               | E             |
| All micro bats               |                                |                                 |               |
| Brush bronzwing              |                                | R/U                             | M             |
| Eastern Bristle Bird         | <i>Dasyornis brachypterus</i>  |                                 | V             |
| Glossy-black Cockatoo        | <i>Calytorhynchus lathamii</i> | R restricted                    | V             |
| Pheasant Coucal              | <i>Centropus phianus</i>       | Regionally Significant          |               |
| Regent Honeyeater            | <i>Xanthomyza phrygia</i>      |                                 | E             |
| Rock Warbler                 | <i>Orima solitaria</i>         | Regionally Significant          | Endemic NSW   |
| Swift parrot*                | <i>Lathamus discolor</i>       | -                               | V             |
| Tawny Grass-bird             | <i>Megalurus timoriensis</i>   | Regionally Significant          |               |
| Turquoise Parrot             | <i>Neophema pulchella</i>      | Regionally Significant          |               |
| Variegated Wren              |                                | R/U                             |               |
| White-bellied Cuckoo-shrike  | <i>Coracina papuensis</i>      | Regionally Significant          |               |
| White-throated nightjar      |                                | S locally significant migratory | -             |
| Yellow-tailed Black-cockatoo | <i>Calytorhynchus funereus</i> | R locally significant           | -             |
| Brown snake                  |                                | R locally significant           |               |
| Eastern Leaf-tailed Gecko    | <i>Phylurus platurus</i>       | R Regionally significant        |               |
| Giant Burrowing Frog         | <i>Helioporus australiacus</i> | R                               | V             |
| Heath Monitor                | <i>Varanus rosenbergi</i>      |                                 | V             |
| Red Crowned Toadlet          | <i>Pseudophryne australis</i>  | R                               | V             |
| Tusked frog                  |                                | R locally significant           |               |
| Tyler's toad                 |                                | R locally significant           |               |

E = Endangered (Part 1—schedule 1, TSC Act); V = Vulnerable (Part 2—schedule 2, TSC Act), R = rare, U = uncommon, M = migratory. NB this list is not exhaustive.

## APPENDIX III

### Summary Table for recording bushland management work

Date: \_\_\_\_\_

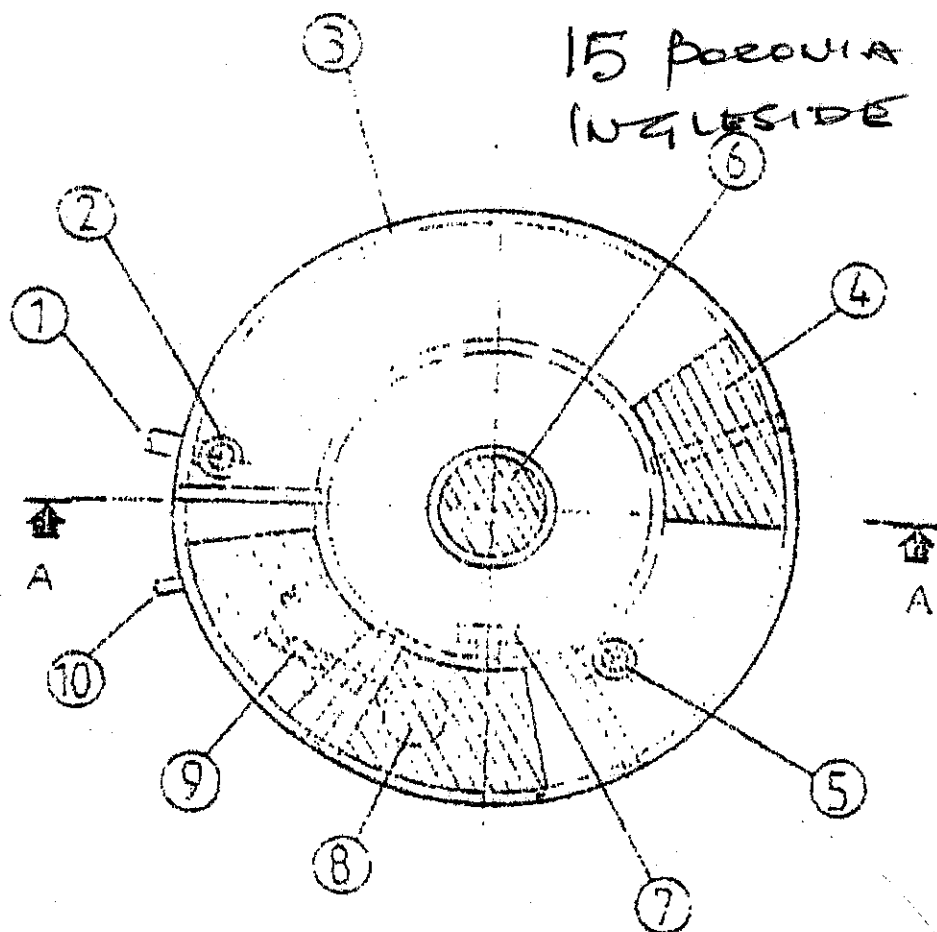
Work done by: \_\_\_\_\_

| Plant Name   | Location | Abundance*<br>+, ++ or +++ | Action taken | Further action<br>required Y/N: when? |
|--------------|----------|----------------------------|--------------|---------------------------------------|
| Pampus Grass |          |                            |              |                                       |
| Lantana      |          |                            |              |                                       |
|              |          |                            |              |                                       |
|              |          |                            |              |                                       |
|              |          |                            |              |                                       |
|              |          |                            |              |                                       |
|              |          |                            |              |                                       |
|              |          |                            |              |                                       |
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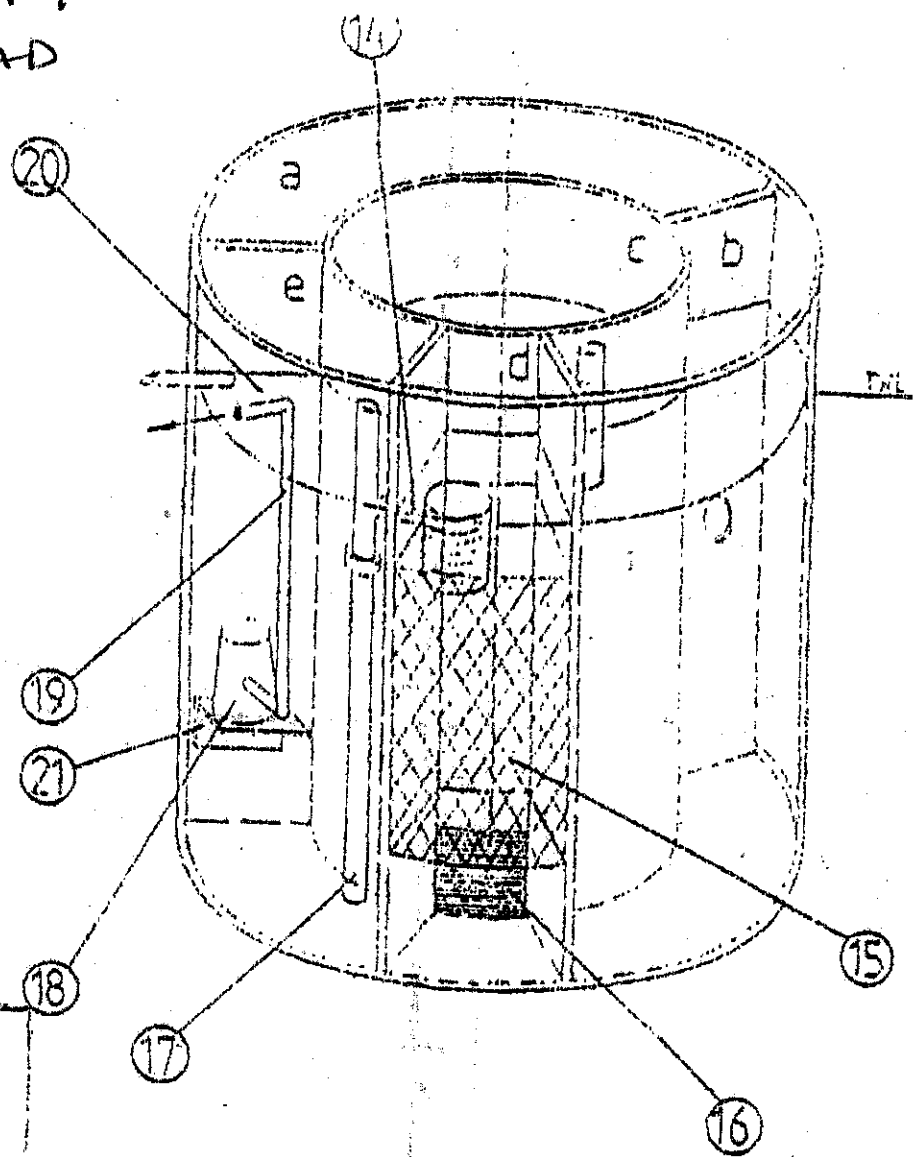
\*Abundance: += 1–10 plants (or <20m<sup>2</sup> covered), ++= 11–50 plants (or 20–50m<sup>2</sup> covered), and +++ = >50 plants (or >50m<sup>2</sup>).

Further Comments:

B. Richter & J. Gopsill  
15 POROVIA ROAD  
INGLESIDE



TOP VIEW

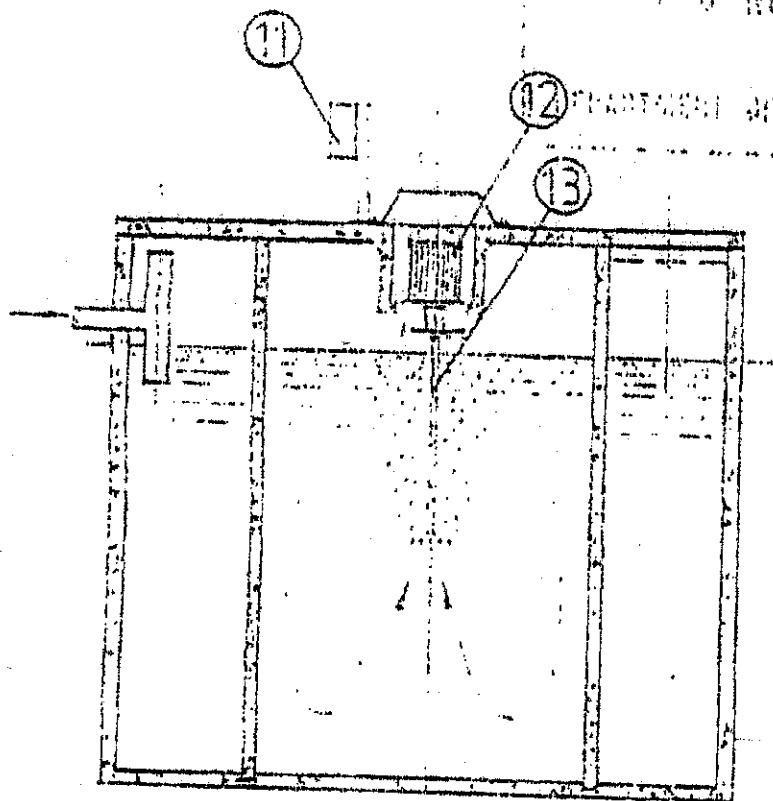


ISOMETRIC VIEW  
LID REMOVED

APPROVED

1 0 NOV 1999

DEPARTMENT OF HEALTH, N.S.W.



SECTION A-A

- a PRIMARY PRE-TREATMENT CHAMBER
- b SECONDARY PRE-TREATMENT CHAMBER  
a + b = 2806 LTR
- c AERATION CHAMBER - 2367 LTR
- d CLARIFIER - 757 LTR
- e CHLORINATOR/PUMPWELL - 740 LTR

TOTAL UNIT CAPACITY : 6720 LTR  
TOTAL VOLUME OF SYSTEM : 9100 LTR

### LEGEND

- 1 INLET 100 DIA. SEWER TO A.S. 3500
- 2 PRECAST CONCRETE INLET PEEP TO A.S./N.Z. 1546/1993
- 3 PRECAST CONCRETE TANK TO A.S./N.Z. 1546/1993
- 4 PRECAST CONCRETE ACCESS LIDS (3 OFF) TO A.S./N.Z. 1546/1993
- 5 PRECAST CONCRETE TRANSFER PEEP TO A.S./N.Z. 1546/1993
- 6 PRECAST CONCRETE AERATOR LID TO A.S./N.Z. 1546/1993
- 7 100MM SEWER GRADE TEE/SURFACE SKIMMER
- 8 ZADOL A100 FILTER
- 9 TAYLEX MOULDED POLYPROPYLENE CHLORINATOR
- 10 50MM S.W.V. EMERGENCY OVERFLOW
- 11 TAYLEX ELECTRONIC CONTROL PANEL WITH PRINTED CIRCUIT
- 12 C.H.G./TAYLEX AERATOR MOTOR
- 13 STAINLESS STEEL SHAFT WITH FOAM RESTRICTOR AND ASPIRATOR
- 14 100MM DIA. SEWER TRANSFER PIPE
- 15 FOOD GRADE P.V.C. BIOMASS PANELS
- 16 STAINLESS STEEL SLUDGE RETURN VORTEX PLATE
- 17 CHLORINE MIXING AND RETENTION 100 DIA. SEWER P.V.C.
- 18 EASYPUMP SUB 700A WITH AUTO FLOAT OPERATION
- 19 32MM DIA. PRESSURE P.V.C. WITH UNION
- 20 32MM IRRIGATION OUTLET SOCKET
- 21 STAINLESS STEEL (316) SUPPORT BRACKET

*Certified as imported & modified*

*N.S.W. Engineer*

*Resident State Council*

*M. Briggs (West) C.P. Engineer 200459*

TAYLEX CLEARWATER 90 COMPACT  
HOME SEWAGE TREATMENT SYSTEM

CLIENT

TAYLEX CLEARWATER 90 PTY. LTD.  
14 ACTIVITY CRESCENT ERNEST, QLD 4214 PH 0755 715 122

DRAWN

ALAYNE WILLIAMS PH 0413 317 020  
QNSA GOLD LICENCE NO. 903 843

DATE FEBRUARY 1996

REVISED

NOV 99

THE COUNCIL OF PITWATER  
**APPROVED**  
DEVELOPMENT CONSENT PLAN

LOT 31 & PART LOT 30  
SECTION A  
DP 11786  
2618m<sup>2</sup>

OUTER FIRE PROTECTION  
ZONE 35m

GAR 146.625 7.53  
5.000

OPEN SWALE AND DRAIN TO RETURN  
WATER FLOWS TO NATURAL COURSE  
(WORK BY OWNER)

DRIVEWAY GRADE  
SCALE 1:200

INNER FIRE PROTECTION  
ZONE 25m

LEGEND

- SEWAGE BUND MOUND 0.5m HIGH
- SILT FENCE
- PROTECTION FENCING
- LOT 1  
DP 314402
- ▲ BUSH/VEGETATION TO BE RETAINED (FF)
- ▲ ENERGY DISSIPATOR (CLOSELY PLACED  
SANDSTONE 400mm X 400mm) TO DISSIPATE  
FLOWS
- SS- SANDSTONE OUTCROP - to be retained
- TRANSPIRATION ZONE

To be brush cut  
to 200mm.

LOT 32  
DP 11786

MANAGED  
BUSH

SEDIMENT CONTROL  
BARRIER

PROPOSED  
RESIDENCE

FFL 146.700  
FGL 146.500

4.200 DIA. PROPOSED  
WATER TANKS 1500 OF  
BODY

GAR FFL  
146.625

CONC BLOCK  
SHED

SEWER  
TANKS

PROPOSED 505m  
TRANSPORATION ZONE

PROPOSED POSITION  
OF ENVIRON CYCLE  
TREATMENT SYSTEM  
(WORK BY OWNER)

1.2m MOUND TO COLLECT  
OVER LAND WATER FLOW  
(WORK BY OWNER)

RELOCATED  
SHED REFERRED  
D4  
N0879/02  
COLOUR - MIST GREEN.

- WORK BY OWNER
- CLEARING OF TREES, ROOTS, SHRUBS
  - RETAINING WALLS
  - SEPTIC CONNECTION FROM 1.0m BEYOND  
HOUSE TO ENVIRON CYCLE SYSTEM
  - ENVIRON CYCLE SYSTEM
  - STORMWATER (90%) CONNECTION  
FROM DOWNPIPES TO HOUSE TO PITS AND  
TANK BY OWNER
  - DISPOSAL OF SURFACE WATER

BORONIA ROAD

RECEIVED  
31.07.03

Ecological Consultant

Bush Fire Consultant Refer Appendix 1 for credentials

Pittwater Council

ABN: 61340837571

**TAX INVOICE**  
**OFFICIAL RECEIPT**

30/10/2003 Receipt No 127970

To INSIGHT DEVELOPMENT PTY LTD

15 BORONIA RD  
INGLESIDE

| Qty/<br>Applic | Reference | Amount |
|----------------|-----------|--------|
|----------------|-----------|--------|

|                |            |         |
|----------------|------------|---------|
| 1              | RMIC-Rcrrd |         |
| GL Rec 1 X DA: | N0766/02   | \$27.27 |

|        |     |        |
|--------|-----|--------|
| GL Rec | GST | \$2.73 |
|--------|-----|--------|

To GL Receipt:

Total Amount: \$30.00

Includes GST of: \$2.73

Amounts Tendered

|          |         |
|----------|---------|
| Cheque   | \$30.00 |
| Total    | \$30.00 |
| Rounding | \$0.00  |
| Change   | \$0.00  |
| Nett     | \$30.00 |

Printed 30/10/2003 11:21:25

Cashier MAnasson