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# **Appendix I**

## **Flora and Fauna Assessment**

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# Flora and Fauna Assessment

Jacks Gully Alternative Waste Treatment Facility,  
Narellan  
(Project No. 02-18)

Report prepared for:  
GHD



September 2004

## Document Tracking

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## 1. Introduction

GHD Pty Ltd commissioned Eco Logical Australia to assess the impact of a proposed Alternative Waste Treatment (AWT) Facility on surrounding flora and fauna at the Jacks Gully Waste Management Centre (WMC).

This report reviews existing data and information, presents results of field survey and provides results and a discussion of implications and recommendations.

### 1.1 Study Area

Jacks Gully WMC is located within the Camden Local Government Area, approximately 55km to the southwest of the Sydney CBD (34.077S latitude, 150.745E longitude) (Figure 1). The site contains an operating regional landfill, materials recycling facility and associated structures and infrastructure.

Surrounding land use consists of: an electricity substation, a chicken hatchery, a waste composting facility, Clutha Coal Washery, Narellan Truck Centre, lands used for sandmining, Elizabeth Macarthur Agricultural Institute (agricultural research activities), and the Nepean River and associated vegetation. Grazing lands also occur, with residential suburbs beyond these to the north and north east, and Mount Annan Botanic Gardens to the northeast. There are proposed residential land releases at Spring Farm, Elderslie and Mount Annan South.

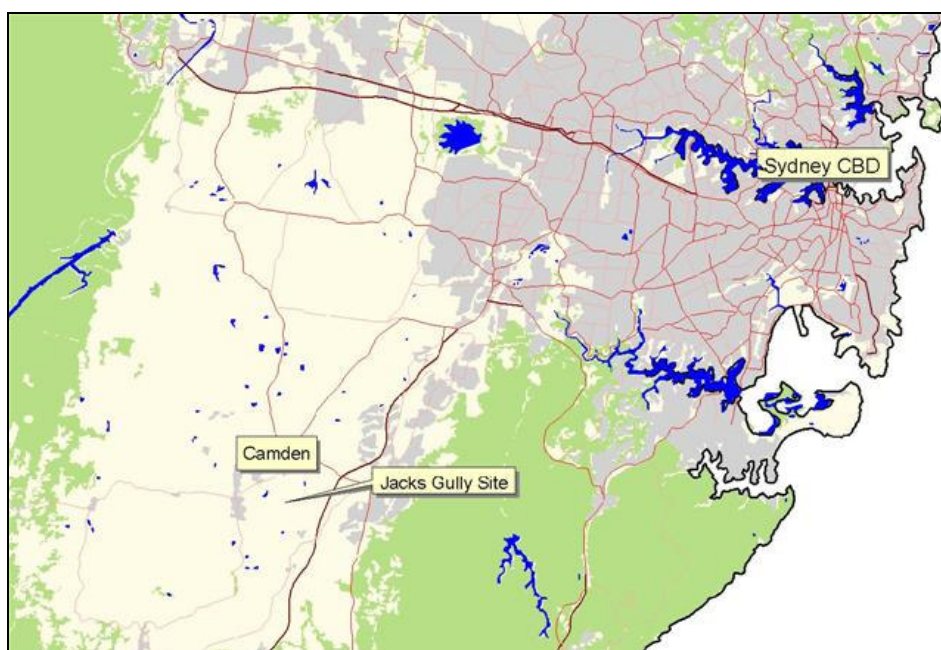


Figure 1. Study area location.

Slopes within the WMC range from steeply sloping (10-20%) to gently sloping (1-5%) (Woodward-Clyde 1999). Topography on the site has also been altered through previous earthmoving and continuing landfilling activities (Figure 3). A large stormwater detention basin has been constructed to the north of the site. Water

runoff from the proposed construction envelope (Figure 2) is generally to the east and north. However, all runoff from the proposed construction envelope would run into the stormwater construction basin to the north. A small unnamed watercourse flows in a northwest direction to the east of the sediment catchment basin and eventually drains to the Nepean River.

The original soils on the site are derived from Bringelly Shale or Tertiary Aeolian Sands (Woodward-Clyde 1999), with much of the soils disturbed due to past activities.

Figure 2 indicates the location of the study area for the proposed AWT Facility in the south western portion of the Jacks Gully WMC. This area is current cleared of vegetation.

Some vegetation clearing does occur on site as part of landfilling activities. This report does not provide an approval for or an assessment of the impact of such activities.

## **1.2 Description of Project**

The proposed AWT Facility at Jacks Gully, Narellan, would consist of four buildings (Figure 2): a Post Processing Building, a Processing Building, a Receiving Hall and a Bio-filter Facility. Associated infrastructure for these four buildings would be included within the building envelope. An access road would be constructed to enter the building envelope at the north west corner and would be built to give access from the north of the site. The facility would be constructed on vacant, cleared land that has already been levelled.

It is understood from discussions with the project team that no vegetation would be removed as part of this proposal and that the building envelope would be sited as far from the adjacent vegetation on the site as the topography and building design allows.

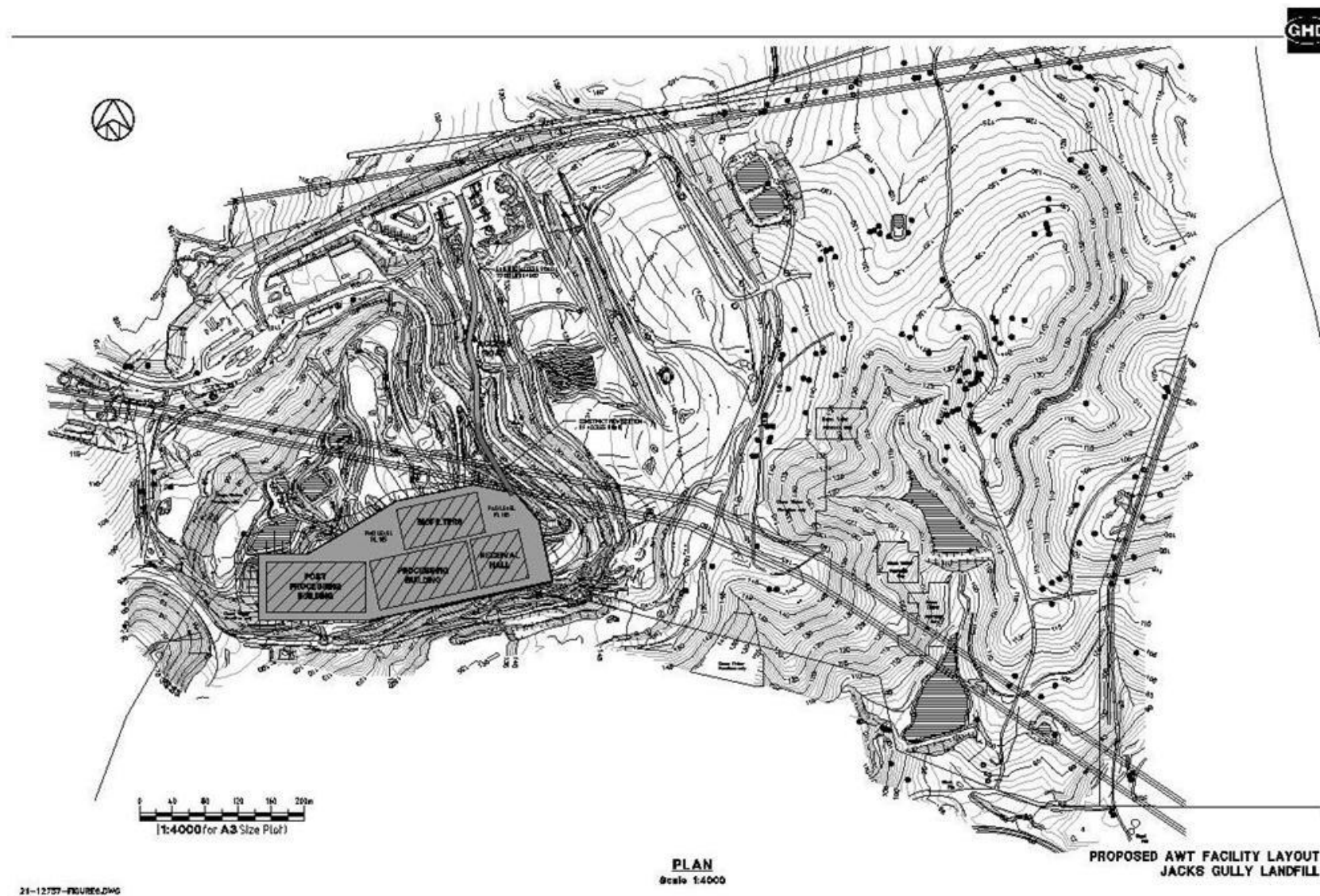


Figure 2: Proposed building envelope



Figure 3: Aerial photograph of the study site.

### 1.3 Legislative Requirements

The legislative requirements pertaining to this proposal and the Flora and Fauna Assessment are discussed below.

#### 1.3.1 *Environmental Planning and Assessment Act 1979*

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) is the principal planning legislation for the state, providing a framework for the overall environmental planning and assessment of development proposals. Various legislation and instruments, such as the NSW *Threatened Species Conservation Act 1995* (TSC Act), are integrated with EP&A Act (see 1.3.2).

The proposal for the Jacks Gully AWT is considered to be a designated development, hence an Environmental Impact Statement (EIS) is required.

In determining a Development Application, the consent authority is required to take into consideration the matters listed under Section 79C of the EP&A Act that is relevant to the application. Key considerations for flora and fauna include:

- Any environmental planning instrument, including drafts
- The likely impacts of the development on flora and fauna

#### *1.3.2 Threatened Species Conservation Act 1995*

The TSC Act aims to protect and encourage the recovery of threatened species, populations and communities listed under the Act. The TSC Act is integrated with the EP&A Act and requires consideration of whether a development (Part 4 of the EP&A Act 1979) or an activity (Part 5 of the EP&A Act) is likely to significantly affect threatened species, populations and ecological communities or their habitat. This report considers the impact of the proposed AWT Facility on threatened species and vegetation communities that have been recorded within and adjacent to the proposal site.

#### *1.3.3 Environment Protection and Biodiversity Conservation Act 1999*

The Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) stipulates that approval from the Commonwealth Environment Minister is required if a development is likely to have a significant impact on matters considered to be of national environmental significance.

#### *1.3.4 LEP zoning*

Jacks Gully is zoned 5(a) Special Uses - Waste Management Centre under the Camden LEP No.104, which allows waste management facilities as a permissible use with development consent.

## **2. Methods**

### **2.1 Data Audit**

Searches of both the EPBC Act Protected Matters and Atlas of NSW Wildlife (threatened species) databases were performed on 3/6/2004. For these searches a search with a 10 kilometre radius from a centre point of -34.0767° latitude, 150.7448° longitude was used. Results from these searches were combined to produce a list of threatened and migratory species for consideration (sections 3.2 and 3.3).

NSW National Parks and Wildlife Service (NPWS) vegetation mapping was also reviewed (section 3.1).

### **2.2 Field Survey**

On Wednesday 9 June 2004 Eco Logical Australia staff conducted a reconnaissance survey of the proposed building area and surrounds at Jacks Gully WMC. The survey effort was in excess of 7 person hours in total. Weather conditions were fine and mild with almost no wind.

As there is no vegetation within the proposed building envelope, effort was focused on confirming vegetation communities and condition immediately adjacent to the site, assessing habitat for fauna and recording opportunistic fauna sightings. Due to the highly disturbed nature of the proposed building footprint no other formal survey methodology was undertaken.

### 3. Results

#### 3.1 Vegetation Communities

Field investigations found that no vegetation was present in the proposed construction envelope. One Endangered Ecological Community (EEC), Cumberland Plain Woodland (mapped by NSW NPWS, 2002 as Shale Hills Woodland) listed under both the TSC Act and EPBC Act, occurs immediately to the west of the building envelope. Impacts on this EEC are considered through an 8-part test (section 4.1).

A total of five vegetation communities are mapped by NSW NPWS as occurring in the vicinity of the study site (within 400m of the study site), and these communities are shown in Figure 6 and their status given in Table 1 below.

**Table 1. Legal status of vegetation communities in the vicinity of the study site**

| <b>Mapped as:</b>     | <b>Endangered Ecological Community (EEC) listing under TSC Act as:</b> | <b>Listed Under EPBC Act</b> |
|-----------------------|------------------------------------------------------------------------|------------------------------|
| Shale Hills Woodland  | Cumberland Plain Woodland                                              | Yes                          |
| Shale Plains Woodland | Cumberland Plain Woodland                                              | Yes                          |
| Alluvial Woodland     | Sydney Coastal River Flat Forest                                       | No                           |
| Riparian Forest       | Sydney Coastal River Flat Forest                                       | No                           |
| Moist Shale Woodland  | Moist Shale Woodland                                                   | No                           |

##### 3.1.1 Cumberland Plain Woodland

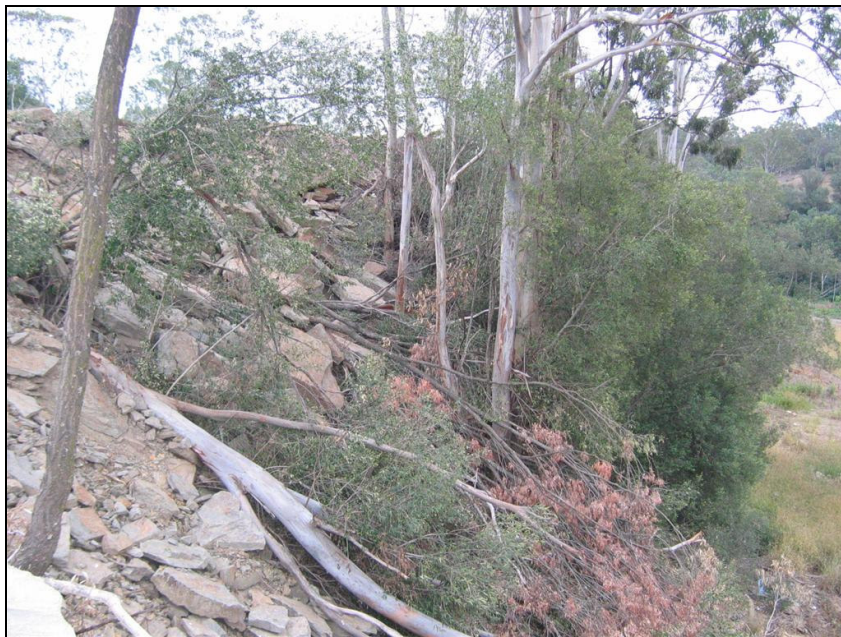
The Cumberland Plain Woodland immediately to the west and adjacent to the building envelope has an intact canopy of native species, including forest red gum (*Eucalyptus tereticornis*), broad-leaved apple (*Angophora subvelutina*), narrow-leaved ironbark (*Eucalyptus crebra*), cabbage gum (*Eucalyptus amplifolia*), and brown stringybark (*Eucalyptus eugenioides*).

Current impacts on this vegetation community include:

- Some fill and felled timber have been pushed against the remnant EEC vegetation, on top of tree root systems (Figures 4 and 5).
- Heavy weed infestation – including African olive (*Olea africanum*) predominant, lantana (*Lantana camara*) and broad-leaved privet (*Ligustrum lucidum*) common.
- Runoff – due to the steep nature of the terrain and the removal of stabilising vegetation from surrounding area, the remnant is highly susceptible to impacts from runoff and subsequent erosion.



**Figure 4: Encroachment on adjacent remnant vegetation**



**Figure 5: Encroachment on adjacent remnant vegetation**

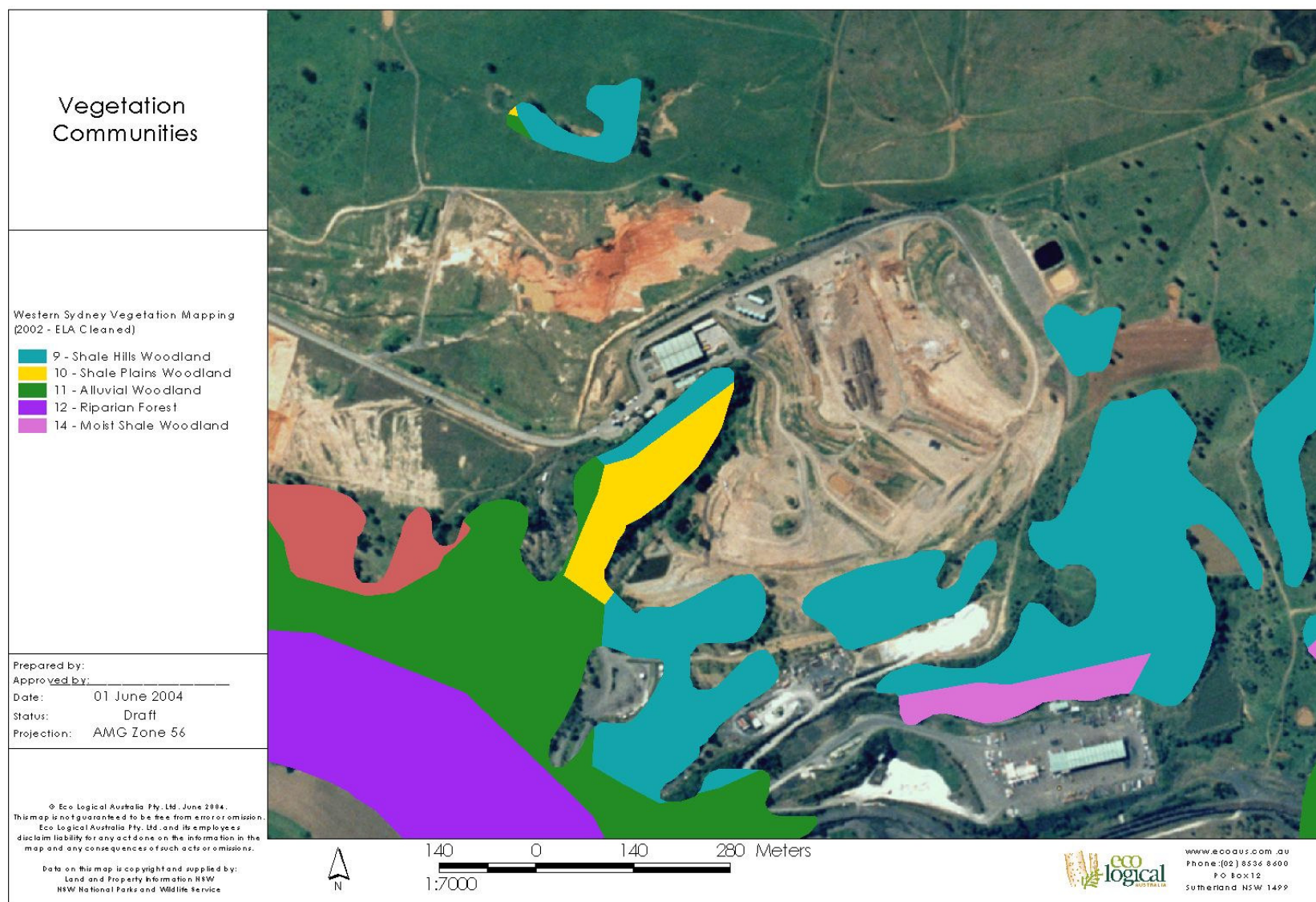


Figure 6: Mapped vegetation communities.

### 3.2 Fauna

A total of 23 bird species, 1 amphibian species and 1 invertebrate were recorded during the field reconnaissance (see Appendix 2). Evidence of the invertebrate species Cumberland Plain Land Snail (*Meridolum corneovirens*) was found (shell). This species is listed as endangered on TSC Act. An impact assessment for this species (8-part test) was conducted (section 4.2).

Habitat assessment in the field determined that a total of eight fauna species listed under the TSC Act or EPBC Act are likely to occur in bushland adjacent to the construction envelope (Table 2).

**Table 2. Fauna species likely to occur in bushland adjacent to the construction envelope.**

| Common Name                 | Scientific Name                            | TSC Status | EPBC Status |
|-----------------------------|--------------------------------------------|------------|-------------|
| Cumberland Plain Land Snail | <i>Meridolum corneovirens</i>              | Endangered | -           |
| Eastern Bent-wing Bat       | <i>Miniopterus schreibersii oceanensis</i> | Vulnerable | -           |
| Eastern False Pipistrelle   | <i>Falsistrellus tasmaniensis</i>          | Vulnerable | -           |
| Eastern Freetail-bat        | <i>Mormopterus norfolkensis</i>            | Vulnerable | -           |
| Greater Broad-nosed Bat     | <i>Scoteanax rueppellii</i>                | Vulnerable | -           |
| Large-eared Pied Bat        | <i>Chalinolobus dwyeri</i>                 | Vulnerable | Vulnerable  |
| Large-footed Myotis         | <i>Myotis adversus</i>                     | Vulnerable | -           |
| Swift Parrot                | <i>Lathamus discolor</i>                   | Endangered | Endangered  |

### 3.3 Flora

A total of 18 native flora species and 26 weed species were recorded during the field reconnaissance (see appendix 2) on or adjacent to the proposed building envelope. No native species were located on cleared areas, but some weed species were observed in these areas. None of these species are listed as threatened on either the State or Commonwealth threatened species legislation. Two of the weed species recorded are declared as noxious; blackberry (*Rubus fruticosus* complex) and broad-leaved privet (*Ligustrum lucidum*). These were observed in vegetation adjacent to the study site (Appendix 2). There are obligations to control these species under the *Noxious Weeds Act 1993*.

Habitat assessment in the field determined that a total of two flora species (Table 3) listed under the TSC Act or EPBC Act could potentially occur in bushland adjacent to the construction envelope.

**Table 3. Flora species that could potentially occur in bushland adjacent to the construction envelope.**

| Common Name              | Scientific Name           | TSC Status | EPBC Status |
|--------------------------|---------------------------|------------|-------------|
| Rufous Pomaderris        | <i>Pomaderris brunnea</i> | Vulnerable | Vulnerable  |
| White-flowered Wax Plant | <i>Cynanchum elegans</i>  | Endangered | Endangered  |

## 4. Impact Assessment

The proposal is located on a cleared and levelled area within the boundary of the existing facility. Potential impacts on flora and fauna from the proposal would be indirect impacts, such as run-off, and weed spread, rather than direct impacts such as vegetation clearing.

Threatened flora and fauna species with a range across the proposal site are listed in Appendix 1. An assessment of the likelihood of occurrence near the proposal site for each threatened species in Appendix 1 was made based on available habitat and species ecology. For those species that prefer habitat similar to that on site, the potential for the proposal to impact them was assessed. On this basis, the eight part test (section 94 of the TSC Act) was applied to the Cumberland Plain Woodland, Cumberland Plain land snail and *Pomaderris brunnea*.

### 4.1 Vegetation Communities

Cumberland Plain Woodland

**a) “In the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction”.**

The Cumberland Plain Woodland is listed as an Endangered Ecological Community, not as a threatened species.

**b) “In the case of an endangered population whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised”.**

The Cumberland Plain Woodland is listed as an Endangered Ecological Community, not an endangered population.

**c) “In relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed”.**

The proposal would not result in native vegetation clearance or modification. Potential indirect impacts should be addressed through revegetation of the embankment and appropriate stormwater management.

**d) “Whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community”.**

The proposal would not isolate Cumberland Plain Woodland from currently connected patches.

**e) “Whether critical habitat would be affected”.**

No critical habitat listed under the TSC Act was recorded on or immediately adjacent to the site.

- f) “Whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas in the region)”.**

Cumberland Plain Woodland has been subject to clearing for over 200 years causing it to be significantly reduced in distribution and extent. The community is not well represented in conservation reserves.

- g) “Whether the action proposed is of a class of action that is recognised as a threatening process”.**

Currently there are 22 threatening processes identified in schedule 3 of the Act. None of these are applicable to the proposal.

- h) “Whether any threatened species or ecological community is at the limit of its known distribution”.**

Cumberland Plain Woodland is restricted to the Sydney Basin. The study area is not at the limit of its range.

## **4.2 Fauna**

Cumberland Plain land snail

- a) “In the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction”.**

The Cumberland Plain land snail is listed as an endangered species. No Cumberland Plain land snails were found on the proposal site, however, a shell was found adjacent to the proposal site in Cumberland Plain Woodland. They are typically found in areas of dense litter, under logs or debris around the bases of trees in Cumberland Plain Woodland and on the fringes of River Flat Forest.

The proposal would not result in the clearance of Cumberland Plain land snail habitat. Appropriate management of adjacent habitat should ensure the long term survival of the species in the area.

- b) “In the case of an endangered population whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised”.**

The Cumberland Plain land snail is listed as an endangered species and ineligible for listing as an endangered population.

- c) “In relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed”.**

A significant area of suitable habitat for Cumberland Plain land snail would not be removed or modified by the proposal.

- d) “Whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community”.**

The proposal would not isolate potential habitat for Cumberland Plain land snail from currently connected patches.

**e) “Whether critical habitat would be affected”.**

No critical habitat listed under the TSC Act was recorded on or immediately adjacent to the site.

**f) “Whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas in the region)”.**

The habitat of the Cumberland Plain land snail has been subject to clearing for over 200 years causing it to be significantly reduced in distribution and extent. The Cumberland Plain land snail is not well represented in conservation reserves.

**g) “Whether the action proposed is of a class of action that is recognised as a threatening process”.**

The proposal is not a threatening process.

**h) “Whether any threatened species or ecological community is at the limit of its known distribution”.**

Cumberland Plain land snail is restricted to the Sydney Basin, but is not at the limit of its range at the study site.

#### **4.3 Flora**

*Pomaderris brunnea*

**i) “In the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction”.**

*Pomaderris brunnea* is listed as a vulnerable species. None were found on the proposal site, however, potential habitat occurs in Cumberland Plain Woodland along drainage lines east and north east of the proposal site. The species is usually found in moist forests and creek lines, although uncommon throughout its range. On the study site such habitat is weed infested and may be too degraded to support the species.

The proposal would not result in the clearance of suitable habitat, however, adequate measures should be employed to ensure bank stability along the proposal site and appropriate treatment of runoff. By adopting these measures, indirect impacts on suitable habitat for this species would be avoided.

**j) “In the case of an endangered population whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised”.**

*Pomaderris brunnea* is not listing as an endangered population.

**k) “In relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed”.**

A significant area of suitable habitat for *Pomaderris brunnea* would not be removed or modified by the proposal.

- l) **“Whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community”.**

The proposal would not isolate potential habitat for *Pomaderris brunnea* from currently connected patches.

- m) **“Whether critical habitat would be affected”.**

No critical habitat listed under the TSC Act was recorded on or immediately adjacent to the site.

- n) **“Whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas in the region)”.**

*Pomaderris brunnea* is not well represented in conservation reserves.

- o) **“Whether the action proposed is of a class of action that is recognised as a threatening process”.**

The proposal is not a threatening process.

- p) **“Whether any threatened species or ecological community is at the limit of its known distribution”.**

*Pomaderris brunnea* is not at the limit of its range at the study site.

#### **4.4 Conclusions**

The proposal should neither significantly impact threatened species known or likely to occur on site, nor the Cumberland Plain Woodland endangered ecological community. The site of the proposal occurs on an existing cleared area and would not result in the clearance of native vegetation. Adherence to the recommendations in section 5 would reduce the potential for the proposal to indirectly impact threatened species and the endangered ecological community.

## 5. Recommendations

The proposal should not significantly impact threatened species or endangered ecological communities on or near the proposal site. By adopting the following recommendations, any potential indirect impacts would be alleviated.

- A buffer zone should be created around remnant native vegetation.
- A buffer zone (and other areas on site) should be landscaped and vegetated with locally native species consistent with the adjoining endangered ecological community.
- Embankments of felled vegetation should be removed.
- Buildings or other infrastructure should be constructed as far from native vegetation as possible.
- Weeds should be controlled and suppressed across the proposal area and edge of native vegetation.
- Stabilise the steep embankment below the proposal site to limit soil movement. Where appropriate, soil should be stabilised with native vegetation and weeds should be suppressed.
- Ensure the proposal adequately captures runoff and stormwater for appropriate treatment so that it does not impact the adjoining endangered ecological community.

## 6. Conclusion

The proposed AWT Facility at Jacks Gully would consist of four buildings constructed in the south west corner of the exiting waste management facility.

Cumberland Plain Woodland and the Cumberland Plain land snail were located adjacent to the proposal site. The proposal is unlikely to impact this endangered ecological community and species provided it remains within the existing cleared building envelope.

The eight part test was applied to Cumberland Plain Woodland, Cumberland Plain land snail and *Pomaderris brunnea* and concluded that a significant impact from the proposed AWT Facility was unlikely.

A number of recommendations have been made in the report. Adhering to these would reduce the potential indirect impacts of the proposal.

## References

Woodward-Clyde (1999). *Flora and fauna study – Jacks Gully WMC*. Unpublished report prepared for Waste Service NSW.

## Appendix 1. Listed Species.

A search of the Atlas of NSW Wildlife and EPBC protected matters database was performed on 4 June 2004 from latitude -33.973S to -34.181S, and longitude 150.64079E to 150.84879E. These search boundaries are 10km from the centre of the study site. The results of the searches were combined, and are presented in the tables below.

### Definition of terms used in tables

TSC Status = Listing under the NSW *Threatened Species Conservation Act 1995*

EPBC Status = Listing under the Federal *Environment Protection and Biodiversity Conservation Act 1999*

Likelihood of Occurrence = An assessment of the likelihood of occurrence within adjacent vegetation for each species based on habitat suitability.

No = Species is highly unlikely to occur

Potential = Species could potentially occur

Likely = Species is likely to occur

Unlikely = Species is unlikely to occur, but vagrant individuals may occur infrequently.

### Flora

| Scientific Name                                      | Common Name                 | TSC Status | EPBC Status | Likelihood of Occurrence |
|------------------------------------------------------|-----------------------------|------------|-------------|--------------------------|
| <i>Acacia bynoeana</i>                               | Bynoe's Wattle, Tiny Wattle | Endangered | Vulnerable  | No                       |
| <i>Caladenia tessellata</i>                          | Thick-lipped Spider-orchid  | Endangered | Vulnerable  | No                       |
| <i>Cynanchum elegans</i>                             | White-flowered Wax Plant    | Endangered | Endangered  | Potential                |
| <i>Eucalyptus benthamii</i>                          | Nepean River Gum            | Vulnerable | Vulnerable  | No                       |
| <i>Grevillea parviflora</i> subsp. <i>parviflora</i> |                             | Vulnerable | Vulnerable  | No                       |
| <i>Lepidium hyssopifolium</i>                        | Basalt Pepper-cress         | Endangered | Endangered  | No                       |
| <i>Leucopogon exolasius</i>                          |                             | Vulnerable | Vulnerable  | No                       |
| <i>Melaleuca deanei</i>                              | Deane's Melaleuca           | Vulnerable | Vulnerable  | No                       |
| <i>Persoonia bargoensis</i>                          |                             | Endangered | Vulnerable  | No                       |
| <i>Persoonia hirsuta</i>                             |                             | Endangered | -           | No                       |
| <i>Persoonia hirsuta</i> subsp. <i>hirsuta</i>       |                             | Endangered | -           | No                       |
| <i>Pimelea spicata</i>                               |                             | Endangered | Endangered  | No                       |
| <i>Pomaderris brunnea</i>                            | Rufous Pomaderris           | Vulnerable | Vulnerable  | Potential                |
| <i>Pultenaea pedunculata</i>                         |                             | Endangered | -           | No                       |

## Fauna

| Scientific Name                            | Common Name                 | TSC Status | EPBC Status            | Likelihood of Occurrence |
|--------------------------------------------|-----------------------------|------------|------------------------|--------------------------|
| <i>Heleioporus australiacus</i>            | Giant Burrowing Frog        | Vulnerable | Vulnerable             | Unlikely                 |
| <i>Litoria aurea</i>                       | Green and Golden Bell Frog  | Endangered | Vulnerable             | No                       |
| <i>Pseudophryne australis</i>              | Red-crowned Toadlet         | Vulnerable | -                      | Unlikely                 |
| <i>Burhinus grallarius</i>                 | Bush Stone-curlew           | Endangered | -                      | No                       |
| <i>Calyptorhynchus lathamii</i>            | Glossy Black-Cockatoo       | Vulnerable | -                      | No                       |
| <i>Climacteris picumnus</i>                | Brown Treecreeper           | Vulnerable | -                      | Unlikely                 |
| <i>Gallinago hardwickii</i>                | Latham's Snipe              | -          | Migratory              | No                       |
| <i>Haliaeetus leucogaster</i>              | White-bellied Sea-Eagle     | -          | Migratory              | Unlikely                 |
| <i>Hirundapus caudacutus</i>               | White-throated Needle-tail  | -          | Migratory              | Unlikely                 |
| <i>Lathamus discolor</i>                   | Swift Parrot                | Endangered | Endangered             | Likely                   |
| <i>Melanodryas cucullata</i>               | Hooded Robin                | Vulnerable | -                      | Unlikely                 |
| <i>Monarcha melanopsis</i>                 | Black-faced Monarch         | -          | Migratory              | No                       |
| <i>Myiagra cyanoleuca</i>                  | Satin Flycatcher            | -          | Migratory              | No                       |
| <i>Ninox strenua</i>                       | Powerful Owl                | Vulnerable | -                      | Unlikely                 |
| <i>Oxyura australis</i>                    | Blue-billed Duck            | Vulnerable | -                      | No                       |
| <i>Pyrrholaemus sagittatus</i>             | Speckled Warbler            | Vulnerable | -                      | Unlikely                 |
| <i>Rhipidura rufifrons</i>                 | Rufous Fantail              | -          | Migratory              | No                       |
| <i>Rostratula australis</i>                | Australian Painted Snipe    | Vulnerable | Vulnerable & Migratory | No                       |
| <i>Stagonopleura guttata</i>               | Diamond Firetail            | Vulnerable | -                      | Unlikely                 |
| <i>Stictonetta naevosa</i>                 | Freckled Duck               | Vulnerable | -                      | No                       |
| <i>Xanthomyza phrygia</i>                  | Regent Honeyeater           | Endangered | Endangered & Migratory | Unlikely                 |
| <i>Macquaria australasica</i>              | Macquarie Perch             | -          | Endangered             | No                       |
| <i>Prototroctes maraena</i>                | Australian Grayling         | -          | Vulnerable             | No                       |
| <i>Meridolum corneovirens</i>              | Cumberland Plain Land Snail | Endangered | -                      | Likely                   |
| <i>Cercartetus nanus</i>                   | Eastern Pygmy-possum        | Vulnerable | -                      | No                       |
| <i>Chalinolobus dwyeri</i>                 | Large-eared Pied Bat        | Vulnerable | Vulnerable             | Likely                   |
| <i>Dasyurus maculatus</i>                  | Spotted-tailed Quoll        | Vulnerable | Endangered             | No                       |
| <i>Falsistrellus tasmaniensis</i>          | Eastern False Pipistrelle   | Vulnerable | -                      | Likely                   |
| <i>Miniopterus schreibersii oceanensis</i> | Eastern Bent-wing Bat       | Vulnerable | -                      | Likely                   |
| <i>Mormopterus norfolkensis</i>            | Eastern Freetail-bat        | Vulnerable | -                      | Likely                   |
| <i>Myotis adversus</i>                     | Large-footed Myotis         | Vulnerable | -                      | Likely                   |
| <i>Petaurus australis</i>                  | Yellow-bellied Glider       | Vulnerable | -                      | No                       |
| <i>Petaurus norfolcensis</i>               | Squirrel Glider             | Vulnerable | -                      | No                       |
| <i>Petrogale penicillata</i>               | Brush-tailed Rock-wallaby   | Endangered | Vulnerable             | No                       |
| <i>Phascolarctos cinereus</i>              | Koala                       | Vulnerable | -                      | Unlikely                 |
| <i>Potorous tridactylus tridactylus</i>    | Long-nosed Potoroo          | Vulnerable | Vulnerable             | No                       |
| <i>Pteropus poliocephalus</i>              | Grey-headed Flying-fox      | Vulnerable | Vulnerable             | Unlikely                 |
| <i>Scoteanax rueppellii</i>                | Greater Broad-nosed Bat     | Vulnerable |                        | Likely                   |
| <i>Hoplocephalus bungaroides</i>           | Broad-headed Snake          | Endangered | Vulnerable             | No                       |
| <i>Varanus rosenbergi</i>                  | Rosenberg's Goanna          | Vulnerable | -                      | No                       |

## Appendix 2. Flora and Fauna Observed.

| Flora Species          |                                 |             |
|------------------------|---------------------------------|-------------|
| Common name            | Scientific Name                 | Status *    |
| Forest red gum         | <i>Eucalyptus tereticornis</i>  |             |
| Kangaroo grass         | <i>Themeda australis</i>        |             |
| Broad-leaved apple     | <i>Angophora subvelutina</i>    |             |
| Narrow-leaved ironbark | <i>Eucalyptus crebra</i>        |             |
| Native geranium        | <i>Geranium solanderi</i>       |             |
| Sydney green wattle    | <i>Acacia parramattensis</i>    |             |
| Black she-oak          | <i>Allocasuarina littoralis</i> |             |
| Blackthorn             | <i>Bursaria spinosa</i>         |             |
| Maidenhair fern        | <i>Adiantum aethiopicum</i>     |             |
| Barbed wire grass      | <i>Cymbopogon refractus</i>     |             |
| Happy wanderer         | <i>Hardenbergia violacea</i>    |             |
| Couch                  | <i>Cynodon dactylon</i>         |             |
| Cumbungi               | <i>Typha orientalis</i>         |             |
| Cabbage gum            | <i>Eucalyptus amplifolia</i>    |             |
| Three-awn speargrass   | <i>Aristida ramosa</i>          |             |
| Creeping saltbush      | <i>Einadia nutans</i>           |             |
| Bracken fern           | <i>Pteridium esculentum</i>     |             |
| Brown stringybark      | <i>Eucalyptus eugenioides</i>   |             |
| Blackberry             | <i>Rubus fruticosus complex</i> | Noxious W3  |
| Broad-leaved privet    | <i>Ligustrum lucidum</i>        | Noxious W4b |
| African olive          | <i>Olea africanum</i>           | Weed        |
| Peppercorn             | <i>Schinus areira</i>           | Weed        |
| Crowfoot grass         | <i>Eleusine indica</i>          | Weed        |
| Red natal grass        | <i>Melinis repens</i>           | Weed        |
| Lantana                | <i>Lantana camara</i>           | Weed        |
| Fire weed              | <i>Senecio madagascariensis</i> | Weed        |
| Rhodes grass           | <i>Chloris gayana</i>           | Weed        |
| Common sow thistle     | <i>Sonchus oleraceus</i>        | Weed        |
| Cobblers peg           | <i>Bidens pilosa</i>            | Weed        |
| Bridal creeper         | <i>Asparagus asparagoides</i>   | Weed        |
| Purple top             | <i>Verbena bonariensis</i>      | Weed        |
| Paddy's lucerne        | <i>Sida rhombifolia</i>         | Weed        |
| Kikuyu                 | <i>Pennisetum clandestinum</i>  | Weed        |
| Wild turnip            | <i>Brassica rapa</i>            | Weed        |
| Fleabane               | <i>Conyza sp.</i>               | Weed        |
| Cape ivy               | <i>Delairea odorata</i>         | Weed        |
| Ink weed               | <i>Phytolacca octandra</i>      | Weed        |
| Red-flowered mallow    | <i>Modiola caroliana</i>        | Weed        |
|                        | <i>Eragrostis sp.</i>           | Weed        |
| Prairie grass          | <i>Bromus catharticus</i>       | Weed        |
| Stinking roger         | <i>Tagetes minuta</i>           | Weed        |
| Flatweed               | <i>Hypochaeris radicata</i>     | Weed        |
| Fennel                 | <i>Foeniculum vulgare</i>       | Weed        |
| Paterson's curse       | <i>Echium plantagineum</i>      | Weed        |

Weed = Environmental weed species.

Noxious = The species is declared as a noxious weed in the Campbelltown LGA.

W3 = The weed must be prevented from spreading and its numbers and distribution reduced.

W4b = The weed must not be sold, propagated or knowingly distributed and any existing weed must be prevented from flowering and fruiting.

| <b>Fauna Species</b>        |                                |                      |
|-----------------------------|--------------------------------|----------------------|
| <b>Common name</b>          | <b>Scientific Name</b>         | <b>Status</b>        |
| Double-barred finch         | <i>Taeniopygia bichenovii</i>  |                      |
| White eared honey eater     | <i>Lichenostomus leucotis</i>  |                      |
| Grey fantail                | <i>Rhipidura fuliginosa</i>    |                      |
| Silvereye                   | <i>Zosterops lateralis</i>     |                      |
| Indian mynah                | <i>Acridotheres tristis</i>    |                      |
| Spotted pardalote           | <i>Pardalotus punctatus</i>    |                      |
| Pied currawong              | <i>Strepera graculina</i>      |                      |
| Brown thornbill             | <i>Acanthiza pusilla</i>       |                      |
| Red-whisker bulbul          | <i>Pycnonotus Jocosus</i>      |                      |
| Australian raven            | <i>Corvus coronoides</i>       |                      |
| Bell miner                  | <i>Manorina melanophrys</i>    |                      |
| Sacred ibis                 | <i>Threskiornis aethiopica</i> |                      |
| Eastern whipbird            | <i>Psophodes olivaceus</i>     |                      |
| Spotted turtle-dove         | <i>Streptopelia chinensis</i>  |                      |
| Common blackbird            | <i>Turdus merula</i>           |                      |
| Australia magpie            | <i>Gymnorhina tibicen</i>      |                      |
| Laughing kookaburra         | <i>Dacelo novaeguineae</i>     |                      |
| Red-browed finch            | <i>Neochmia temporalis</i>     |                      |
| Welcome swallow             | <i>Hirundo neoxena</i>         |                      |
| European goldfinch          | <i>Carduelis carduelis</i>     |                      |
| Yellow-faced honeyeater     | <i>Lichenostomus chrysops</i>  |                      |
| Grey butcherbird            | <i>Cracticus torquatus</i>     |                      |
| Superb fairy-wren           | <i>Malurus splendens</i>       |                      |
|                             |                                |                      |
| Common eastern froglet      | <i>Crinia signifera</i>        |                      |
|                             |                                |                      |
| Cumberland Plain land snail | <i>Meridolum corneovirens</i>  | Endangered (TSC Act) |