

## Flora and Fauna – Summary of Outcomes

This report assesses the flora and fauna impacts of the proposed Buronga Peaking Power Plant with regard to Commonwealth and NSW State planning and environmental legislation (including the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*, the *Environmental Planning and Assessment Act 1979 (EP&A Act)*, the *Threatened Species Conservation Act 1995 (TSC Act)*, *Native Vegetation Act 2003*, State Environmental Planning Policy (SEPP) 44 and the *Noxious Weeds Act 1993*.

A desktop literature review was undertaken by URS to identify threatened species, populations and ecological communities listed under the *TSC Act* and the Commonwealth *EPBC Act* that could be expected to occur within the Study Area. Botanical surveys were conducted at and within the vicinity of the site in order to:

- map and describe the vegetation communities occurring within the study area;
- compile a flora list of those species occurring within the vegetation communities, identifying any threatened, nationally, regionally or locally significant species and communities; and
- assess the likely impacts of the proposed development and provide recommendations to assist in minimising impacts to flora in the study area.

Fauna surveys were carried out consistent with the DECC (DEC 2004) working draft survey guidelines. Methodologies employed to survey fauna included: diurnal bird counts, pitfall trapping, active searches, Anabat survey, stag watching, call playback, spotlighting, fauna habitat assessment, ground debris searches, opportunistic observations and reference site survey.

A total of 36 plant species were identified from flora surveys. None of these species are listed as threatened under the *TSC* or *EPBC Act*. The site contained 4 native vegetation communities including Sandplain Mallee, Belah Woodland, Chenopod Shrubland and Black Box Woodland.

The fauna survey recorded 15 mammals, 45 species of bird, 7 reptiles and 1 crustacean. There was an abundant and species-rich assemblage of native birds at the site. Three fauna species listed as Vulnerable under the *TSC Act*, namely the Hooded Robin (*Melanodryas cucullata*), Little Pied Bat (*Chalinolobus picatus*) and Large-footed Myotis (*Myotis adversus/macropus*), were recorded at the site during the 2007 surveys.

Areas considered within the Flora and Fauna assessment predominantly comprise of native vegetation with low to moderate disturbance. The proposed development will result in the removal of approximately 4 ha of native vegetation in total and will result in the removal of habitat, including standing and fallen dead timber and hollow-bearing trees, and foraging resources for native fauna including those listed as Vulnerable under the *TSC Act*. Overall the impacts associated with the peaking power plant location with regard to flora are minor in the context of remaining vegetation in the locality and the surrounding region.

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In addition to those *TSC Act* listed fauna species recorded at the site, a further 10 threatened fauna species are considered a medium to high likelihood of occurring in the study area on a seasonal or transitory basis based on habitats present on site and recent DECC (2007a) records in the vicinity. These include:

- *Burhinus grallarius* Bush Stone-curlew;
- *Polytelis anthopeplus monarchoides* Regent Parrot (eastern subsp.);
- *Cacatua leadbeateri* Major Mitchell's Cockatoo;
- *Nyctophilus timoriensis* Eastern Long-eared Bat (South-eastern form); and
- *Cinlosoma castanotus* Chestnut Quail-thrush.
- *Ninox connivens* Barking Owl;
- *Aprasia inaurita* Mallee Worm-lizard;
- *Ningai yvonneae* Southern Ningai;
- *Manorina melanotis* Black-eared Miner; and
- *Leipoa ocellata* Malleefowl.

Section 5A of the EP&A Act, although not formally required as part of the Part 3A assessment process, has been addressed as a guide to the consideration of impacts on threatened species, populations and ecological communities listed under the *TSC Act*. Accordingly, specific 7-part tests of significance were performed for the Hooded Robin, Little Pied Bat and Large-footed Myotis. The assessments conclude that the proposed development is not 'likely' to impose a 'significant effect' on these species should appropriate mitigation measures (outlined in **Section 12.8**) be implemented. Specifically, if practicable, the construction of the facility should be timed as to avoid the breeding period of the Hooded Robin, breeding individuals should also be avoided and a pre-clearing survey should be implemented.

Construction at the proposed site will also affect potential habitat for those threatened species predicted to occur in the study area, as listed above. A 7-part test of significance was performed which concluded that the proposed development is not 'likely' to impose a 'significant effect' on these species.

Mitigation measures related to construction and operation of the peaking power plant include:

- Erosion and sediment control;
- Dust control;
- Pre-clearance survey;
- Tree clearance protocol;
- Groundcover clearance protocol;
- Weed and pest management; and
- Site management.

## 12.1 Introduction

URS Australia Pty Ltd (URS) was engaged by International Power (Australia) Pty Ltd to undertake a flora and fauna assessment for the proposed Buronga Peaking Power Plant Project located near Buronga in the southwest of NSW. The site location and footprint is shown on **Figure 12-1**. The site assessed comprises the development footprint for the proposed peaking power plant and associated access off Arumpo Road. The study area refers to the development footprint and the surrounding area which encompasses shared features of the natural environment.

This report assesses the flora and fauna impacts of the proposed facility with regard to Commonwealth and NSW State planning and environmental legislation (including the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*, the *Environmental Planning and Assessment Act 1979 (EP&A Act)*, the *Threatened Species Conservation Act 1995 (TSC Act)*, *Native Vegetation Act 2003*, State Environmental Planning Policy (SEPP) 44 and the *Noxious Weeds Act 1993*.

The full flora and fauna assessment is provided within **Appendix E** of this Environmental Assessment.

## 12.2 Methodology

The methodology for this assessment included the following elements:

- Literature review;
- Botanical survey; and
- Fauna survey.

The methods are discussed in more detail below.

## 12.3 Literature Review

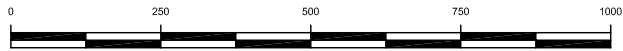
A desktop literature review was undertaken by URS to identify the representative spectrum of Threatened species, populations and ecological communities listed under the *TSC Act* and the Commonwealth *EPBC Act* that could be expected to occur within the Study Area, based on habitats present. To this end, the following documentation was reviewed prior to the conduct of the field investigations:

- a search of the NSW NPWS Wildlife Atlas database (August 2007 – 10km radius search for *TSC Act* listed flora and fauna, centred on the site. Selected NSW Robinvale Plains (Part B) sub-region for Endangered Ecological Communities); and
- *EPBC* online Protected Matters Database Search (May 2007 – a selected point, coordinates - 34.0924,142.27138 buffered at 10km).



TRANSGRID PROPERTY  
BOUNDARY

PROPOSED SITE  
FOOTPRINT



1 : 12500



Client INTERNATIONAL POWER (AUSTRALIA) PTY LTD  <b>URS</b>	Project ENVIRONMENTAL ASSESSMENT BURONGA PEAKING POWER PLANT	Title SITE FOOTPRINT					
	<table border="1"> <tr> <td>Drawn: AH</td> <td>Approved: WB</td> <td>Date: 26/10/07</td> </tr> <tr> <td>Job No: 43177455</td> <td colspan="2">File No: 43177455.001</td> </tr> </table>	Drawn: AH	Approved: WB	Date: 26/10/07	Job No: 43177455	File No: 43177455.001	
Drawn: AH	Approved: WB	Date: 26/10/07					
Job No: 43177455	File No: 43177455.001						

## 12.4 Botanical Survey

Botanical surveys were conducted at and within the vicinity of the site (the Study Area) on 8 and 9 August 2007. The primary objectives of the survey were to:

- map and describe the vegetation communities occurring within the study area;
- compile a flora list of those species occurring within the vegetation communities, identifying any threatened, nationally, regionally or locally significant species and communities; and
- assess the likely impacts of the proposed development and provide recommendations to assist in minimising impacts to flora in the study area.

The botanical surveys were consistent with the *DECC Threatened Biodiversity and Assessment; Guidelines for Developments and Activities Working Draft* (DEC 2004). All vascular taxa observed were recorded on appropriate proforma field data sheets.

Plant specimens not readily identifiable in the field were collected and subsequently identified using standard botanical texts and where required were compared with voucher specimens held in the National Herbarium of New South Wales Online Reference Collection. Vegetation communities were described according to classifications made by Specht (1970).

Plant identifications were made according to nomenclature in Harden (1990, 1991, 1992, 1993). Plant specimens which were difficult to identify (either insufficient sample collected or buds/fruitlet bodies were not available at the time of the survey) were submitted to the NSW National Herbarium for identification. Suspected *TSC Act* or *EPBC Act* listed species were submitted to the Herbarium for verification.

Conservation status of species and communities recorded across the Study Area in August 2007 were determined with reference to relevant legislation including the *TSC Act* and the *EPBC Act*.

On the basis of air photo interpretation, the initial site walkover and habitat assessment the site was divided into stratification units i.e. functionally similar units for the purposes of environmental assessment according to the Draft DECC (DEC 2004) survey guidelines.

Vegetation surveys of the peaking plant site were undertaken on 8 and 9 August 2007 to inventory and map plant taxa and target vegetation communities within the Study Area. Survey methodology included five 20m x 20m quadrats, the location of which were based on the distribution of vegetation types present within the Study Area such that the extent of vegetation which may be disturbed as a result of the proposal was appropriately assessed (**Figure 12-2**).

Whilst the above sampling method provides a broad inventory of species and enables description of the vegetation community, it does not account for threatened flora that occur at much lower densities than widespread or common species. Therefore the random meander technique was employed in an effort to capture any species overlooked during quadrat surveys. This technique involved traversing the entire survey site and recording any species not found within previous quadrant surveys. This survey methodology, prescribed by Cropper (1993), is considered appropriate by the DECC for this type of work.

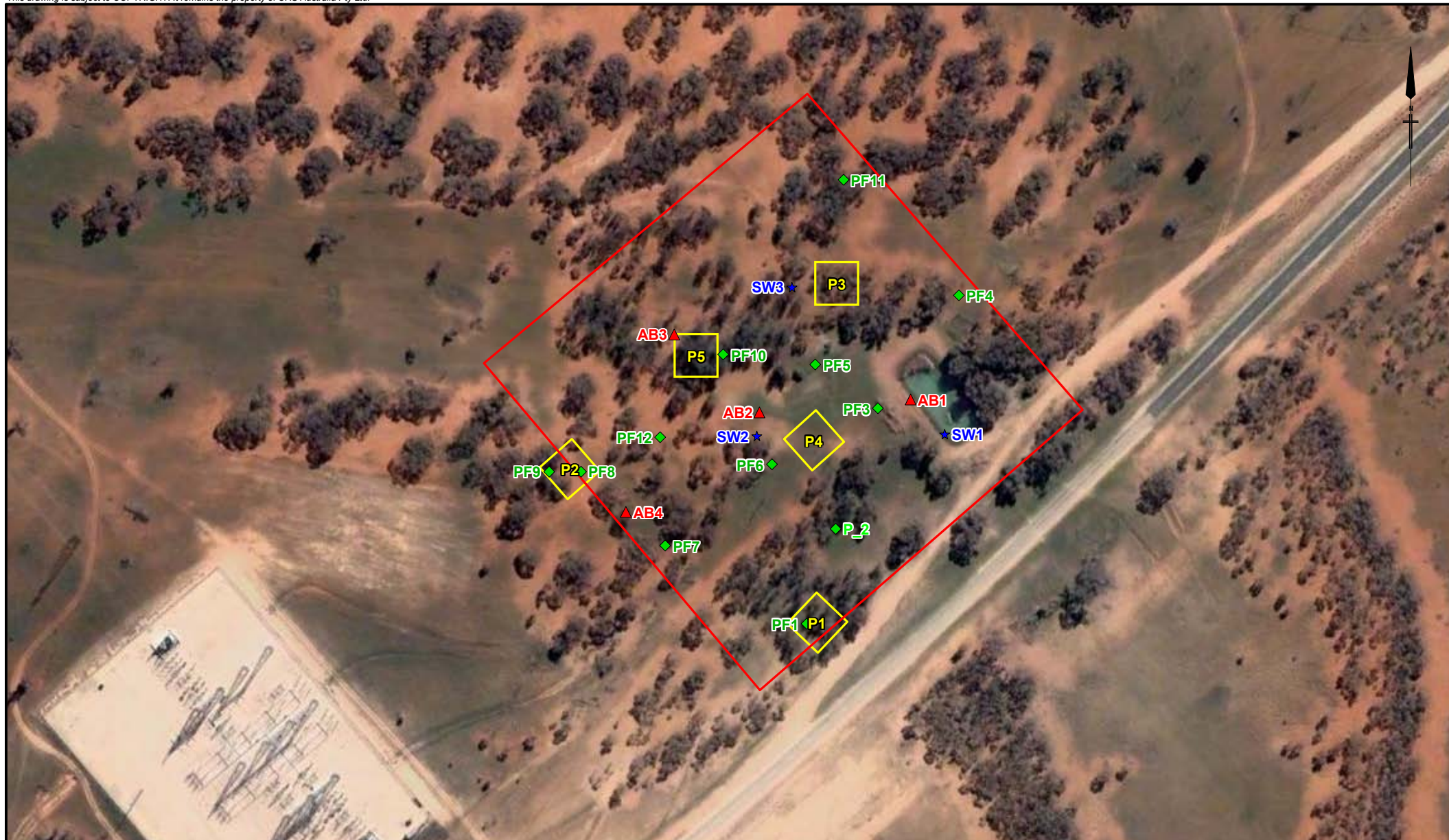
### 12.5 Fauna Survey

Preliminary fauna surveys were carried out on 8 and 9 August 2007 and were generally consistent with the DECC guidelines (DEC 2004). Methodologies employed included diurnal bird counts, litter searches, opportunistic observations and track and scat analysis.

Targeted fauna surveys were carried out from 8 to 12 October 2007 and were also generally consistent DECC guidelines (DEC 2004). The survey design was based on the likelihood of threatened species identified in the literature review occurring on site and the initial habitat assessment (**Appendix E**). Methodologies included diurnal bird counts, pitfall trapping, active searches, anabat survey, stag watching, call playback, spotlighting, fauna habitat assessment, ground debris searches, opportunistic observations and reference site survey. Survey effort and timing was consistent with the DECC guidelines (DEC 2004). The timing of the targeted surveys for the detection of targeted threatened fauna was also confirmed through consultation with Buronga National Parks and Wildlife Service (NPWS) staff (Ewan P. pers. Comm.). All observations were recorded on appropriate pro forma field data sheets.

Weather during the August 2007 preliminary surveys comprised dry, clear, cool-mild days (7-19degC) and cool nights (6degC). Conditions during the dawn and dusk bird surveys were calm, with mild westerly and north-westerly breezes (BOM, 2007).

Weather during the October 2007 surveys comprised dry, clear, cool-mild days (7-19degC) and cool nights (4-7degC). Conditions during the dawn and dusk bird surveys were calm, with mild westerly and northwesterly breezes (BOM, 2007). There was a new moon (i.e. not visible at night) during the October surveys and there was no light spill from human sources. Traffic along Arumpo road was very light with less than one vehicle movement per hour. Conditions through the October survey were suitable for the detection of small nocturnal fauna.



Legend:

- Site Boundary
- 20 x 20m Vegetation Survey Quadrats
- ▲ Echolocation (Anabat) Survey Location
- ◆ Pitfall Trap with 10m Drift Fence
- ★ Stag Watch Survey Location

Source: Google Earth

Client INTERNATIONAL POWER (AUSTRALIA) PTY LTD  	Project ENVIRONMENTAL ASSESSMENT BURONGA PEAKING POWER PLANT  Drawn: BH    Approved: WB    Date: 22/05/2008 Job No: <b>43177455</b> File No: 43177455.003	Title <p style="text-align: center;"><b>SURVEY EFFORT</b></p> Figure: <b>12-2</b>
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## 12.6 Results of Assessment

### 12.6.1 Literature Review

#### *Flora*

The desktop literature review indicates five threatened plant species listed under the *TSC/EPBC Acts* which have been previously recorded or are predicted to occur in the locality. Three species were considered unlikely to occur at the site as they are dependent upon heavy soils or periodically inundated sites. Suitable habitat for these species may occur in the study area at Lake Gol Gol however the site contains well-drained Aeolian sands. Two species were considered likely to occur in the study area:

- *Swainsona pyrophila*      Yellow Swainson-pea; and
- *Santalum murrayanum*      Bitter Quandong.

No threatened flora populations listed under the *TSC/EPBC Acts* are known from the locality.

Two endangered ecological communities (EEC's) have previously been recorded in the locality.

#### *Fauna*

The desktop review indicates the potential presence of a further 15 threatened fauna species listed under the *TSC Act* and/or *EPBC Act*, which have previously been recorded in the local area, which are predicted to occur in the local area. A review of the specific habitat requirements of these species, and the habitat present within the study area and its surrounds allowed a number of these species to be eliminated as having low likelihood of occurrence at the site.

Five species were considered a high likelihood of occurrence at the site based on the presence of suitable foraging and roosting habitat and recent records in the local area:

- *Burhinus grallarius*      Bush Stone-curlew;
- *Polytelis anthopeplus monarchoides*      Regent Parrot (eastern subsp.);
- *Cacatua leadbeateri*      Major Mitchell's Cockatoo;
- *Nyctophilus timoriensis*      Eastern Long-eared Bat (South-eastern form); and
- *Cincolosoma castanotus*      Chestnut Quail-thrush.

A further five species were considered a medium likelihood of occurrence at the site based on the presence of marginal foraging and roosting habitat and recent records in the local area:

- *Ninox connivens*      *Barking Owl*;
- *Aprasia inaurita*      *Mallee Worm-lizard*;
- *Ningai yvonneae*      *Southern Ningai*;
- *Manorina melanotis*      *Black-eared Miner*; and
- *Leipoa ocellata*      *Malleefowl*.

These threatened species may use habitat resources in the site on a transient, seasonal or opportunistic basis.

## 12.6.2 Field Assessment

### *Flora*

A total of 36 plant species were recorded during the field survey, comprising 12 exotic species, and 24 native species. Of the exotic species 2 are listed as a noxious weed within Wentworth LGA. No threatened flora species or communities listed under the *TSC* or *EPBC Acts* were observed during field surveys and there are no previous records of threatened flora occurring on the site (DECC, 2007a).

The study area provides potential habitat for 2 threatened flora species, the Yellow Swainson-pea and the Bitter Quandong. An assessment of the significance of the proposed development on threatened flora species (in general) has been undertaken (**Appendix E**). The outcome is that the proposed development is unlikely to result in a significant impact on any flora species located within the development footprint.

### *Fauna*

The URS 2007 fauna surveys recorded 15 mammals, 45 species of bird, 7 reptiles and 1 crustacean. A considerable abundance and diversity of native bird species occupy the site, the majority of which are mobile, widespread and common. The mammals observed during the 2007 surveys included the exotic European Rabbit (*Oryctolagus cuniculus*), Brown Hare (*Lepus capensis*), European Fox (*Oryctolagus cuniculus*) and the domestic dog (*Canis familiaris*). No kangaroos were observed throughout the entire survey period which may suggest the site has been degraded by livestock and Rabbit grazing and does not provide suitable foraging habitat. Microchiropteran bat call analysis revealed the presence of 11 species of microbat.

Three threatened species listed as Vulnerable under the *TSC Act*, were recorded during the 2007 surveys, namely the Hooded Robin (*Melanodryas cucullata*), Little Pied Bat (*Chalinobus picatus*) and Large-footed Myotis (*Myotis adversus/macropus*) (**Appendix E**).

### *Habitat descriptions*

Vegetation communities are illustrated in Figure 12-3. Habitat features considered in assigning the quality of habitat on site were:

- *native diversity in ground flora;*
- *structural and floristic diversity of vegetation layers, particularly presence or absence of midstorey (shrubs and juvenile canopy species) and/or presence of native tussock grasses;*
- *presence and quantity of litter layer and fallen dead timber;*
- *level of shelter, breeding, roosting and nesting resources available;*
- *presence of stem hollows and quantity of mature hollow bearing trees;*
- *exfoliated bark, feed trees and shrubs;*
- *fauna movement corridors;*
- *position in the landscape, connectivity or value as a habitat corridor;*
- *presence of rocky outcrops or partially buried rocks; and*
- *presence, size and ecological integrity of remnant communities.*

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The habitat assessment identified the following key habitat types across the study area:

#### *Sandplain Mallee*

The Sandplain Mallee was observed to be relatively intact and contained healthy, mature trees. However it was observed to support only moderate structural diversity as the canopy featured relatively uniform-aged stands of mallee-form trees with few emergents and limited recruitment of juveniles and seedlings. The shrub layer was very-sparse to absent. This lack of structural diversity may limit the habitat value of this community for some woodland and forest bird species (Keast et al, 1985). These include the threatened species Black-eared Miner (*Manorina melanotis*) and Malleefowl (*Leipoa ocellata*) which are known from the locality but prefer dense stands of mallee with a thick, variable shrub stratum. The matrix of treed vegetation communities and Chenopod Shrubland at the site is likely to suit species which favour more open mallee-country. These include the Hooded Robin, which was recorded throughout the site, the Bush Stone-curlew (*Burhinus grallarius*) and the Chestnut Quail-thrush (*Cinclosoma castanotus*).

*Eucalyptus socialis* in this community feature good quantities of exfoliating bark which would provide shelter for native reptiles, invertebrates and micro bats and foraging substrate for native birds. Further, *Eucalyptus socialis* is nectar-bearing and provides a food resource for native fauna, including birds such as the White-eared Honeyeater and Yellow-plumed Honeyeater observed on site, other nectar feeding birds, and potentially arboreal mammals.

There was a sparse, patchy ground cover of exotic pasture species and herbaceous weeds mixed with a reasonable diversity of native chenopods and herbs. This would provide suitable foraging habitat for native herbivorous mammals.

The substrate was of moderate quality throughout the majority of this community with thin, patchy leaf litter, some woody debris and occasional fallen tree hollows. This is likely to provide adequate cover for native invertebrates, reptiles and possibly small terrestrial mammals. Substrate quality was greatest in the immediate vicinity of the mature habitat trees. There was excellent, thick cover of leaf litter surrounding the largest trees and good quantities of fallen timber. This provides shelter and foraging habitat for small terrestrial animals including native invertebrates, reptiles and mammals.

Many small terrestrial animals of semi-arid Australia rely on extensive clumps of spinifex to provide shelter and foraging habitat (DECC, 2007b; Cogger, 1996). These include the TSC Act listed *Aprasia inaurita* (Mallee Worm-lizard) and *Ningui yvonnae* (Southern Ningui). Accordingly the Sandplain Mallee may only provide marginal habitat for these species.

Soils in the Sandplain Mallee were friable loamy sands and would provide suitable habitat for fossorial (burrowing) reptiles as well as species that build burrows for shelter. There were no significant rock outcrops or large, platy rock fragments that would support habitat for other reptile species.

At the local scale the Sandplain Mallee has good connectivity with other treed communities on the site. This diversity of vegetation species and structures within a relatively intact patch is likely to increase the habitat value of the site as a whole.

Sandplain Mallee on site does not form part of a continuous, treed habitat corridor at the regional scale as it occurs in a matrix with Chenopod Shrubland and cleared country. Larger patches of Sandplain Mallee may have significance as a refuge for fauna migrating across open country given the fragmented nature of vegetation throughout the region. There is important habitat in protected lands along the Murray River to the south and in Mallee Cliffs National Park to the east. Healthy populations of native fauna are likely to occur in these areas and more mobile species would utilise habitat present on the site. These may include the TSC/EPBC Act listed species Regent Parrot (*Polytelis anthopeplus monarchoides*) Major Mitchell's Cockatoo (*Cacatua leadbeateri*) and Barking Owl (*Ninox connivens*) which are likely to utilise roosting habitat in mature *Eucalyptus camaldulensis* (River Red Gums) along the Murray River and forage in the surrounding area. Sandplain Mallee on site would provide suitable foraging habitat for these species.

#### *Belah Woodland*

This community has a dense canopy of mature trees including hollow-bearing habitat trees and stags. It provides important shelter and roosting habitat for native birds. Nests of the Apostlebird, which builds mud nests in mature trees and Chestnut-rumped Thornbill, which nests in stem-hollows were observed in the study area during the field surveys. Stem-hollows may also provide diurnal roosts for micro-bats, including the Eastern Long-eared Bat (*Nyctophilus timoriensis*).

The shrub and groundcover layers are sparse, as is typical for Casuarineacea-dominated communities, and provides limited foraging opportunities for shelter-dependent native birds and terrestrial mammals. The substrate was of moderate to good quality throughout this community. Leaf litter cover was patchy but there were excellent quantities of woody debris including potentially important piles of fallen timber and hollow-bearing logs. This community is likely to support a healthy assemblage of native invertebrates, reptiles and potentially small terrestrial mammals and micro bat species. As described for Sandplain Mallee the community would not support terrestrial fauna associated with unburnt Spinifex.

Soils in the Belah Woodland were hard-setting sandy clays and would not provide habitat for fossorial species.

The Belah Woodland may constitute a fauna movement corridor to other treed communities in the study area. Due to the discontinuous nature of the community as a whole and sparse, patchy shrub and groundcover layers it is likely to be of most significance to birds and microbats and only limited value as a movement corridor for terrestrial fauna. As described for Sandplain Mallee, local populations of the Regent Parrot, Major Mitchell's Cockatoo and Barking Owl are likely to forage at the site. These species forage in open country however the Barking Owl relies on denser stands of vegetation for roosting and movement across the landscape. The Belah Woodland may therefore important foraging habitat for the Barking Owl and similar species given the fragmented nature of the surrounding vegetation and the relatively open structure of other treed communities in the study area.

#### *Chenopod Shrubland*

It is likely that some Chenopod Shrubland at the site is a product of historic clearing. However all areas of the community at the site are consistent with Chenopod Shrubland as defined by DECC (2007c) and provides habitat for native species associated with this community.

Chenopod Shrubland at the site featured a very low, sparse shrub stratum and extensive areas of bare earth. The matrix of Chenopod Shrubland and treed communities at the site provides habitat for

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open mallee-country specialists including the Hooded Robin, Bush Stone-curlew and the Chestnut Quail-thrush. It may also provide foraging habitat for larger native mammals and reptiles.

Chenopod Shrubland contains small quantities of woody debris or other shelter but occurs in close proximity to treed communities with superior habitat resources. Accordingly this community would still provide important foraging habitat for small, shelter dependent terrestrial species. As discussed above this community is unlikely to support Spinifex-dependent species including *Aprasia inaurita* and *Ningauai yvonnae*.

Chenopod Shrubland would provide foraging habitat for micro bats given the proximity of other resources such as intact vegetation and tree hollows.

### *Black Box Woodland*

The Black Box Woodland occurred as small patches and isolated individual trees which may limit its suitability for shelter-dependent species. Single-stemmed *Eucalyptus largiflorens* in this community were the tallest trees present at the site and may provide important roost sites for raptors. Overall this community has similar structural attributes and connectivity to Belah Woodland at the site and is likely to support an equivalent suite of native fauna and threatened species.

*Eucalyptus largiflorens* is a secondary food tree species for the Koala (*Phascolarctos cinereus*) in the Far West & South West Koala Management Area. However there are no records of the species in the locality or for Wentworth LGA (DECC, 2007a) and so the species is unlikely to occur at the site.

### *Aquatic and wetland habitat*

The site contained one ephemeral wetland – a man made dam of approximately 100 m<sup>2</sup>. Crayfish shells were observed in the dam. The dam is likely to support other native aquatic fauna however there are no recent records or specific habitat attributes that suggest the presence of threatened aquatic species. The dam would have a dense cover of *Typha orientalis* (Bulrush) when inundated which would provide suitable habitat for many native birds, reptiles and frogs. Due to the isolation of this aquatic habitat within extensive areas of semi arid woodland and shrubland, these species would be dominated by more mobile bird, bat and reptile species and burrowing species of frogs. This may include the *TSC/EPBC Act* listed Australian Painted Snipe (*Rostratula australis*). Wetlands and associated fringing vegetation on site are probably too disturbed and too small in area to support local populations of the species however they may be used intermittently as foraging habitat. The *TSC/EPBC Act* listed *Litoria raniformis* (Southern Bell Frog) has been recorded in the study area (DECC, 2007b) but requires permanent aquatic habitats as refuges during dry periods and so is unlikely to occur at the site (Ehmann, 1997).

During inundated periods the dam is likely to provide foraging habitat for micro-bats, namely the *TSC Act* listed Large-footed Myotis (*Myotis adversus/macropus*), given the proximity of intact woodland and hollow-bearing trees. It may also be an important resource for terrestrial mammals and birds given the aridity of the surrounding landscape.

### *Other habitat resources*

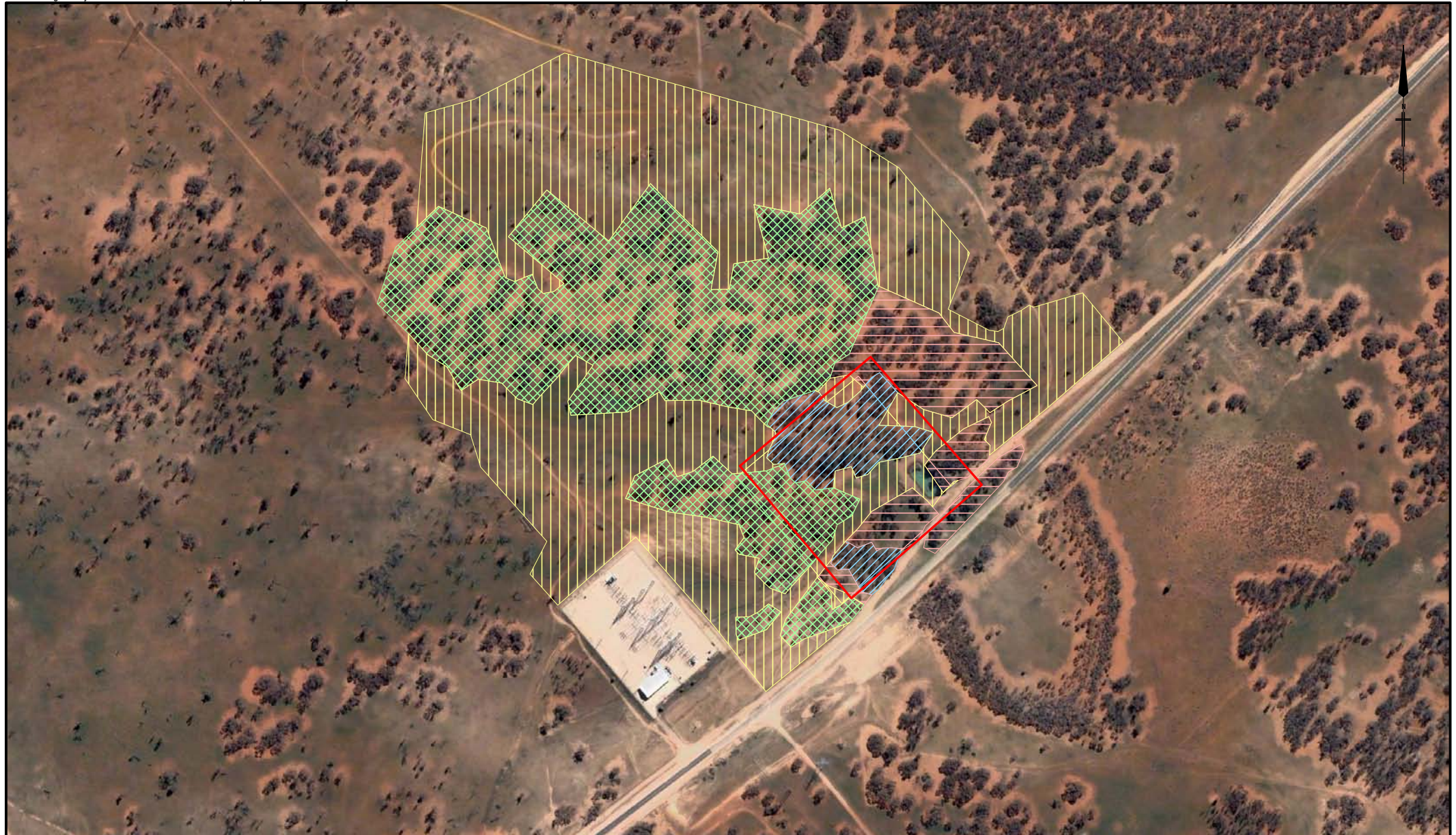
The DEC (2004) guidelines identify “special habitats” (e.g. water bodies, rocky outcrops and cliffs) that are likely to support specific fauna assemblages. These resources may be significant for threatened species (DECC, 2007b). Tree hollows are of particular significance for native fauna as diurnal or nocturnal shelter sites, for rearing young, for feeding, for thermoregulation, and to facilitate ranging behaviour and dispersal. An estimated 15% of all terrestrial vertebrate fauna in Australia are dependent upon tree hollows and for many of these species the relationship is obligate ie. no other habitat resource represents an adequate substitute (Gibbons and Lindenmayer, 2002). Accordingly the August 2007 field survey included a targeted survey of habitat resources in addition to the assessment of the communities described above.

Approximately ten important habitat trees are present on site (**Appendix E**). Hollow-bearing trees may provide suitable diurnal roost sites for tree-roosting microbats including the *TSC Act* listed Little Pied Bat (*Chalinolobus picatus*) and Large-footed Myotis (*Myotis adversus/macropus*) which were recorded at the site. They are also likely to support native parrots including the Mallee Ringneck and Galah, observed during the field survey. The Superb Parrot and Major Mitchells Cockatoo may also use these resources though local populations of these species are more likely to select hollows in taller trees and larger, less disturbed patches of vegetation.

Other habitat resources such as fallen logs and debris were present in good quantities through the site. Fallen timber piles are probably a product of previous land clearing however in their current state they provide excellent shelter for native fauna.

There were no significant rock outcrops, boulder piles or caves in the study area. Rock fragments were sparse to absent.

No SEPP 44 Schedule 2 koala feed tree species are present on site, however *Eucalyptus largiflorens* is a secondary food tree species as discussed above.



Legend:

- Site Boundary
- Chenopod Shrubland
- Chenopod Mallee
- Black Box Woodland
- Belah Woodland

Source: Google Earth

Client

INTERNATIONAL POWER  
(AUSTRALIA) PTY LTD



Project

ENVIRONMENTAL ASSESSMENT  
BURONGA PEAKING POWER PLANT

Drawn: BH	Approved: WB	Date: 22/05/2008
Job No: 43177455		File No: 43177455.004.wor

Title

**VEGETATION COMMUNITIES**

Figure: 12-3

## 12.7 Impact Assessment

### 12.7.1 Conservation Significance

No threatened flora species or communities listed under the *TSC* or *EPBC Acts* were observed during field surveys and there are no previous records of threatened flora occurring on the site (DECC, 2007a).

The study area provides potential habitat for 2 threatened flora species namely the Yellow Swainson-pea and Bitter Quandong. An assessment of the significance of the proposed development on threatened flora species (in general) has been undertaken (**Appendix E**). The outcome is that the proposed development is unlikely to result in a significant impact on any flora species located within the development footprint.

Three threatened fauna species listed as Vulnerable under the *TSC Act*, namely the Hooded Robin, Little Pied Bat and the Large-footed Myotis, were recorded at the site during the 2007 surveys. The Hooded Robin is likely to utilise the site on a semi-permanent basis (during breeding season) and will be directly impacted by construction of the peaking power plant. The Little Pied Bat and the Large-footed Myotis are also likely to intermittently use the site as foraging habitat and may also use hollow bearing trees as diurnal roosts. Potential impacts upon these species due to the construction and operation of the proposed peaking power plant site are outlined below. Section 5A of the EP&A Act has been addressed as a guide to the consideration of impacts on threatened species, populations and ecological communities listed under the *TSC Act*.

A 7-part test of significance was performed for the local population of the Hooded Robin that is known to occupy the site (**Appendix E**). The 7-part test concludes that the proposed development is not 'likely' to impose a 'significant effect' on the Hooded Robin should appropriate mitigation measures outlined in **Section 12.7** be implemented.

A 7-part test of significance was also performed for the Little Pied Bat and the Large-footed Myotis that are likely to intermittently use the site (**Appendix E**). The 7-part test concludes that the proposed development is not 'likely' to impose a 'significant effect' on these species should appropriate mitigation measures outlined in **Section 12.7** be implemented.

A 7-part test of significance was also performed on the 10 threatened fauna species considered to have a medium to high likelihood of occurrence in the study area based on habitats present on site and recent DECC (2007a) records in the vicinity (**Appendix E**). The 7-part test concludes that the proposed development is not 'likely' to impose a 'significant effect' on these species.

### 12.7.2 Peaking Power Plant Site

#### ***Vegetation Clearing and Construction Impacts***

IPRA, prior to commencement of work at the development site, would prepare detailed construction programs and methods. These would be dependent on the detailed design and would demonstrate compliance with conditions of consent issued for the Buronga Peaking Power Plant Project and other statutory requirements. This assessment of construction impacts is based on indicative design drawings.

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## Flora and Fauna

The peaking power plant would occupy an area of approximately 4.1 ha. Buildings would be constructed on site to provide for office work area, amenities, a control room, workshop and stores facilities. The plant footprint would be surrounded by a chain mesh fence. Construction activities will be limited to within the site and should not impact on any additional areas of native vegetation.

#### Flora

The proposed development will require the disturbance of approximately 4 ha of native vegetation in total. The area to be impacted in each vegetation community is summarised in the **Table 12-1** below.

**Table 12-1 Vegetation Communities to be affected by proposed development**

No.	Vegetation Community	Area to be disturbed during construction (m <sup>2</sup> )	Conservation significance
1	Sandplain Mallee	0.8 ha	Not listed ( <i>TSC Act/EPBC Act</i> )
2	Belah Woodland	1.3 ha	Not listed ( <i>TSC Act/EPBC Act</i> )
3	Chenopod Shrubland	1.3 ha	Not listed ( <i>TSC Act/EPBC Act</i> )
4	Black Box Woodland	0.6 ha	Not listed ( <i>TSC Act/EPBC Act</i> )
<b>Total</b>		4 ha	

This footprint includes the portion of the peaking power plant site footprint and landscaped areas. Native vegetation that falls within the landscaped strip will be retained.

Overall the impacts associated with the peaking power plant location with regard to flora are minor in the context of remaining vegetation in the locality and the surrounding region.

#### Fauna

The proposed development will involve the construction and operation of a peaking power plant occupying a footprint of approximately 200m x 200m. This infrastructure will result in the removal of habitat and foraging resources for native fauna, including the threatened species outlined in **Section 12.5**. The development will involve the removal of important resources such as standing and fallen dead timber and hollow-bearing trees. Three Key Threatening Processes listed in Schedule 3 of the *TSC Act* will be directly contributed to by the proposal:

- Clearing of native vegetation;
- Removal of dead wood and dead trees; and
- Loss of hollow-bearing trees.

Native vegetation within the site footprint is shown on **Figure 12-3** and important habitat resources within **Appendix E**. The removal of these resources is 'likely' to 'threaten the survival or evolutionary development of species, populations or ecological communities' within the site. The magnitude of these 'likely' impacts is assessed below.

A considerable abundance and diversity of native bird species occupy the site and will be impacted by the removal of these resources. The majority of these species are mobile, widespread and common. It is unlikely that native birds will be killed or otherwise directly impacted by the construction or operation of the peaking power plant. However, there are large quantities of equivalent habitat and resources in the surrounding region and so it is likely that the impact on local populations of native birds will be low to moderate.

A breeding pair of Hooded Robins was nesting within the plant footprint during the October 2007 survey. The development footprint and the immediate surroundings are likely to constitute the majority of their home range during the breeding season, however for the remainder of the year they are likely to occupy a much larger home range of up to 30 ha (ACT Govt, 1999; Bell, 1983). Some plasticity in the home ranges of the species is likely and there are large areas of equivalent habitat in the locality. Therefore the loss of up to 4 ha of habitat within the home range of these individuals is unlikely to prevent them from occupying the local area on an ongoing basis. Mitigation measures including, timing of construction outside the breeding period if practicable, a pre-clearing survey and avoidance of breeding individuals, will be required to avoid significant impacts on this species during construction. The existing switching station immediately adjacent to the site is of similar size and activity levels as the proposed peaking power plant. This has not precluded the species from occupying and breeding within the site. Therefore operation activities of the peaking power plant are also unlikely to prevent the species from occupying alternative habitats adjacent to the site. Provided the mitigation measures outlined in **Section 12.7** are followed it is not 'likely' that the proposed development and operation of the peaking power plant will have a significant impact upon local populations of the Hooded Robin (refer to **Appendix E**).

A total of 11 species of micro bat were recorded by Anabat at the site during the 2007 surveys. As these species are mobile and generally widespread and considering that there is connecting habitat adjacent to the site, the loss of 4 ha of foraging resources and potential roost habitat at the site is likely to constitute a minor impact upon these species in the local area. Mitigation measures outlined in **Section 12.7** are likely to ameliorate any impacts on these species.

A moderate diversity and abundance of native reptiles are likely to occupy the site. Species recorded during field surveys were widespread and common (Cogger, 1996). It is likely that individuals will be killed or displaced during clearing, particularly species which burrow or shelter beneath woody debris. Mitigation measures outlined in **Section 12.7** are likely to ameliorate these impacts. These include: a pre-clearance survey and relocation of individuals where practicable; and careful removal of large woody debris and placement within landscaped areas of the site or adjoining areas. The loss of up to 4ha of habitat is likely to have a minor impact on local populations of these species given the large areas of native vegetation and other resources in the vicinity of the site.

The existing dam will be entirely removed which will result in the death or displacement of native burrowing frogs and crustaceans currently occupying this habitat. The proposed evaporation and sediment pond may provide compensatory habitat for these species once constructed. Since the pond would be lined and lack aquatic vegetation this habitat would provide far less habitat value than the existing dam. During wet periods the existing dam is considered to provide an important resource for terrestrial mammals, such as micro bats, and birds given the aridity of the surrounding landscape. The operating plant site will be fenced and hence this resource would be lost to terrestrial mammals though birds and bats are likely to use the evaporation and sediment pond.

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## Flora and Fauna

There will be moderate, short term impacts on fauna utilising adjacent areas of habitat during the construction period associated with noise and other disturbances. Impacts during the operational phase are likely to be minor, especially given the relatively brief proposed periods of operation (up to a maximum of 10% of any year). Mitigation measures such as sound-proofing of the turbines and fencing of all operational areas should ensure these impacts are minimal.

### ***Secondary and Operational Impacts***

#### *Sediments and Runoff*

The Construction Environmental Management Plan (CEMP) should include safeguards and mitigation measures to minimise potential impacts from additional runoff and associated erosion and transfer of sediments during high rainfall events. The design of the facility will incorporate stormwater and wastewater ponds. This storage would be separated and lined to ensure no contamination of surface or groundwater in the vicinity of the site.

The risk of additional impacts is considered low because the local area is relatively flat and there are no water bodies or other sensitive receptors in the vicinity of the site. Standard construction controls, such as hay bales and silt fences, should ensure no adverse impacts from erosion or transport of sediments should this occur during construction. The site is relatively flat and there are no sensitive receptors immediately downslope.

#### *Artificial lighting*

Night-time security or operational lighting can potentially discourage habitat use where diffuse light penetrates into adjoining areas of vegetation. Nocturnal foraging regimes could be disrupted and may advantage predators such as cats, dogs and foxes as they are not strictly nocturnal foragers.

Nocturnal species' (such as owls, gliders and possums) eyesight is hindered by bright lights, and where they are affected by this, they become more susceptible to predation.

Construction would only occur during daylight hours and so it unlikely that large floodlights would be required during the construction. It is likely that some lighting may be required for emergencies, maintenance or security. Such lighting should be designed as 'down lights' and not spill outside the areas of disturbance proposed by the development.

#### *Roads and Access*

Proposed access to the Site is from Arumpo Road via a short constructed entrance road. Predicted traffic volumes during the construction phase include: average peak hour traffic during the two months of high construction activity of 9 heavy vehicle movements per day and 39 light vehicle movements per day. This will represent an increase in the risk of vehicle collisions with fauna utilising habitats adjacent to Arumpo Road, which experiences very light traffic volumes.

The entrance road itself is less than 50m long. Collisions within this area are unlikely as vehicle speeds over such a short distance will be very low and ongoing disturbance from construction activities are likely to discourage fauna from using this area. Construction would only occur during daylight hours and so vehicle collisions with macro-fauna are unlikely to correspond to travel periods for species present in the area.

During the operational phase staff levels are expected to average one (1) full time person with up to 2 (two) more on an intermittent basis generating two (2) vehicle trips over the morning and evening peak periods. This volume of operational traffic is likely to have a minor impact upon travelling macro-fauna. Additional traffic (normally during daylight hours) associated with raw water and fuel deliveries post-construction is relatively light and infrequent and so is unlikely to have significant impacts on native fauna utilising habitats through this area.

## 12.8 Mitigation Measures

A number of mitigation measures have been identified in order to minimise potential impacts to flora. The CEMP and Operational Environment Management Plan (OEMP) developed for the project would include the mitigation measures outlined in **Table 12-1**.

### ***Soil Erosion / Runoff***

The CEMP should contain detailed safeguard measures to reduce soil erosion and pollutant run-off during both construction and operation phases.

### ***Dust***

Appropriate construction and operational mitigation measures must be incorporated into the final detailed design to minimise the generation of dust and associated impacts on adjacent natural environments. These are likely to include:

- Setting maximum speed limits for construction and operational traffic on site to limit dust generation;
- Use of a water tanker or similar to spray unpaved roads during construction; and
- Hard paving of the operational areas of the facility.

### ***Pre-clearance Survey***

A detailed pre-clearance survey by a qualified ecologist will be required prior to development of the site. This should involve:

- diurnal searches for birds, nests and roosts;
- active searches for reptiles, including checking of woody debris within the development footprint,
- active searches for micro bats, including checking under exfoliating bark; and
- nocturnal surveys, including stag-watching of identified habitat trees, specifically focusing on observing use of trees by micro bats.

This survey would focus on locating individuals, and especially nests, of the Hooded Robin as this species is very likely to occur within the local area. Construction should be planned to occur outside the species' breeding season of August to November if practicable. The species is likely to occupy a home range of up to 30 ha surrounding the site outside of this period and so direct impacts on the species should be avoidable (BIBY, 2007; Bell, 1983).

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## Flora and Fauna

If nests or nestlings of the Hooded Robin are observed within, or close to, the development footprint then construction should be postponed until the nestlings have hatched and fully-fledged. The incubation period of the species is approximately 14 days and rearing period is a further 14 days (BIBY, 2007). If construction constraints mean that this delay is not practicable then Buronga DECC should be consulted to determine if relocating the birds is acceptable.

A similar approach of delaying or modifying construction should be adopted if any other *TSC/EPBC Act* listed species are recorded during the pre-clearance survey. Should micro bats be observed roosting within habitat trees within, or close to, the development footprint then construction should be postponed until a suitably qualified bat expert is consulted.

If non-threatened birds or other arboreal species are detected within the footprint then they should be managed according to the Tree Clearance Protocol outlined below.

If reptiles or other fauna are detected then they should be relocated by appropriately qualified personnel to equivalent habitat outside of the development footprint wherever practicable.

### ***Tree Clearance Protocol***

A Tree Clearance Protocol (TCP) is required for the site as it involves the removal of important habitat trees (>40cms diameter breast height or any trees with hollows). Further, nesting birds were observed in the development footprint during field surveys and would potentially occupy the site during construction.

Due care during clearing is recommended to reduce direct impacts to any tree dwelling fauna species which may be utilising the area. Trees should be monitored for fauna during clearing operations and the following procedure applied:

- Trees with resident fauna should be felled with a heavy bulldozer that pushes from the same side as the roost in question so that the roost is uppermost when the tree is lying on the ground.
- The tree should be "tapped" several times with the bulldozer blade to alert any resident fauna and then pushed using the base of the blade at approximately 1 -2 metres from the ground until it starts to lean. The blade is then lowered to the base of the trunk where major roots protrude, and the tree is then held in position.
- The tree is then gently lowered to the ground by raising the blade so the machine operator can control the rate of fall to reduce damage.
- It is assumed that resident fauna will depart of its own accord.
- Trees with nesting birds should not be felled until they are fledged, but if this is not possible they should be taken to a WIRES wildlife carer. However no attempt should be made to fell trees housing the Hooded Robin. In this instance, the Buronga DECC should be consulted to discuss relocating the birds.
- Cleared vegetation should not be 'pushed' into surrounding intact native vegetation.

### ***Groundcover Clearance Protocol***

Groundcover substrate and especially large woody debris provides important habitat for native fauna, including threatened species. It is recommended that a groundcover clearance protocol be incorporated into the CEMP. It is recommended that the protocol involve the following steps:

- identify areas of intact leaf litter or large woody debris and avoid if possible;
- remove large woody debris using excavator grabs or manual handling if practicable (racking);
- place intact large woody debris within landscaped areas (i.e. the visual-screening strip around the margin of the plant site);
- scrape and stockpile leaf litter and topsoil separately from deeper fill material; and
- reuse leaf litter and topsoil within landscaped areas.

### ***Landscaping and revegetation***

The final design of the proposed peaking power plant will include landscaped areas around the perimeter of the site to reduce the visual impact on neighbouring properties. This should involve retention of existing vegetation where possible and supplementary plantings as required. Plant species selected should be representative of the vegetation communities previously located on the site. A variety of native species, including trees, shrubs and groundcover species should be selected to increase species and structural diversity. Species selected and spacing will also need to meet the Asset Protection Zone (APZ) planting requirements as specified within **Chapter 13** and **Appendix F** of this Environmental Assessment Report. The health of revegetated areas should be monitored closely and supplementary watering supplied as appropriate. Revegetated areas should be monitored for weed infestation and any infestations actively managed to minimise further weed spread.

It is recommended that security fencing surrounding the site be located inside landscaped areas to maximise the connectivity between landscaped or retained areas and surrounding habitat. This may also serve to minimise the risk of negative operational impacts upon fauna utilising these areas by excluding them from built areas of the site.

The site contains fallen timber that is likely to constitute an important habitat resource for native fauna. It is recommended that timber within the development footprint be carefully replaced in areas of intact vegetation adjacent to the site.

### ***Weed and Pest Management***

Intact areas of native vegetation should be temporarily fenced prior to construction, thereby restricting access by construction crew and machinery. Additionally, stockpiles of fill or vegetation should not be placed in areas of adjoining remnant vegetation but instead within existing cleared areas.

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## Flora and Fauna

A Weed and Pest management plan should be prepared as part of the Construction Environmental Management Plan and Operation Environmental Management Plan for the site.

It is recommended that the following measures be adopted to manage environmental weeds during construction and operation of the site:

- Perform a baseline weeds survey to assess the extent and severity of weed infestation in extant native vegetation within the study area pre and post construction;
- Incorporate control measures in the design of the proposed development to limit the spread of weed propagules downstream of the site;
- During construction: maintenance of silt fences and other mitigation measures to isolate runoff; and immediate rehabilitation of disturbed vegetation to limit the potential for colonisation by weeds;
- During construction areas of vegetation that will not be cleared should be fenced, restricting access by construction crew and machinery to remnant vegetation. Additionally, stockpiles of fill should not be placed in areas of remnant vegetation but instead in adjacent cleared areas;
- During operations monitor and control Noxious Weed species in line with legislative obligations; and
- Perform ongoing monitoring of weed infestation on and on and adjoining the study area utilising the baseline weeds survey of the site and its surrounds.

### ***Site Management***

The following mitigation measures are recommended in order to minimise operational impacts of the proposed development:

- Setting maximum speed limits during construction and operation traffic on site to reduce fauna road fatalities;
- Limit vehicular and personnel entry into adjacent remnant vegetation during construction and operation through appropriate marking of operational areas; and
- Using down-lights and motion sensor lighting in order to reduce light spill and the associated secondary impact on nocturnal fauna species potentially utilising the adjoining vegetation.

## 12.9 Summary

Areas considered within the Flora and Fauna assessment predominantly comprise of native vegetation of low to moderate disturbance including Sandplain Mallee, Belah Woodland, Chenopod Shrubland and Black Box Woodland. Other habitat resources at the site include aquatic and wetland habitats. Clearing of approximately 4ha of these habitat types for construction of the proposed Buronga Peaking Power Plant is unlikely to have significant impacts with regard to flora in the context of remaining vegetation in the locality and the surrounding region.

Section 5A of the EP&A Act, although not formally required as part of the Part 3A assessment process, has been addressed as a guide to the consideration of impacts on threatened species, populations and ecological communities listed under the *TSC Act*. Accordingly, 7-part tests of significance were performed for the threatened biota described above. The assessments conclude that the proposed development is not 'likely' to impose a 'significant effect' on these species should appropriate mitigation measures be implemented during construction and operation of the peaking power plant.

Mitigation measures related to construction and operation of the plant include:

- Erosion and sediment control;
- Dust control;
- Pre-clearance survey;
- Tree clearance protocol;
- Groundcover clearance protocol;
- Weed and pest management; and
- Site management.

A summary of mitigation measures is presented in **Table 12-2**.

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## Flora and Fauna

Table 12-2 Summary of Flora and Fauna Mitigation Measures

Mitigation Measures	Implementation of mitigation measures		
	Design	Construction	Operation
Large floodlights would generally not be used, although it is likely that some lights may be required for emergency lighting to allow emergency maintenance	✓		✓
Security lighting would be designed not to direct light outside the property boundary.	✓		✓
Development and implementation of Groundcover Clearance Protocol to reduce impact to habitat values of area.		✓	
Development and implementation of a Pre-clearance Survey to locate fauna to reduce direct impacts to any ground or tree dwelling fauna species.		✓	
Development and implementation of Tree Clearance Protocol to reduce direct impacts to any tree dwelling fauna species.		✓	
Develop and implement a Weed and Pest Management Plan as part of the CEMP and OEMP for the site. The plan would include active control of Noxious weeds.		✓	✓
Implement site management practices such as: <ul style="list-style-type: none"> <li>– Setting maximum speed limits during construction and operation traffic on site to reduce fauna road fatalities;</li> <li>– Limit vehicular and personnel entry into adjacent remnant vegetation during construction and operation through appropriate fencing; and</li> <li>– Using down-lights and motion sensor lighting in order to reduce light spill and the associated secondary impact on nocturnal fauna species potentially utilising the adjacent vegetation.</li> </ul>		✓	✓
CEMP and OEMP to include safeguard measures to reduce soil erosion and pollutant run-off during both construction and operation phases.		✓	✓
Revegetation and Landscaping of the plant site. Species selected to be representative of local provenance. Revegetated and Landscaped areas to be monitored for weed infestation and any infestations actively managed.	✓	✓	✓