Legend:

- Site Boundary
- Hooded Robin (August, 2007) *Melanodryas cucculata*
- Hooded Robin Nesting Pair (October, 2007) *Melanodryas cucculata*

Source:
Datum: GDA94, Projection: UTM, Grid: MGA Zone 54

Drawn: AJW	Approved: DRAFT	Date: 19/10/2007
Job No: **43177455**	File: 43177455-005.wor	

Client

INTERNATIONAL POWER
(AUSTRALIA) PTY LTD

Project

ENVIRONMENTAL ASSESSMENT
- BURONGA PEAKING POWER PLANT

Title

THREATENED SPECIES

Figure: **5**

URS

Legend:

- Site Boundary
- Fallen Timber Pile
- Habitat Tree
- Nest/Roost
- Ephemeral Wetland (Farm Dam)

Source:
Datum: GDA94, Projection: UTM, Grid: MGA Zone 54

Drawn: AJW	Approved: DRAFT	Date: 19/10/2007
Job No: **43177455**	File: 43177455-006.wor	

Client

INTERNATIONAL POWER
(AUSTRALIA) PTY LTD

Project

ENVIRONMENTAL ASSESSMENT
- BURONGA PEAKING POWER PLANT

Title

IMPORTANT HABITAT FEATURES AND RESOURCES

Figure: **6**

URS

Plates

Plate 8-1 Sandplain Mallee

Plate 8-2 Belah Woodland

Plates

Plate 8-3 Chenopod Shrubland

Plate 8-4 Important habitat resources in Belah Woodland

Plates

Plate 8-5 Important habitat tree

Appendix A Species Lists

Plate 8-6 Hollow-bearing tree with Chestnut-rumped Thornbill nest

Plate 8-7 Hooded Robin nest within plant site

Appendix A Species Lists

Table 1. Threatened plants and EECs known or predicted to occur within the locality

Botanical Name	Common Name	*TSC Act* Status	*EPBC Act* Status	Habitat Requirements	Previous Records	Potential Occurrence at the Site
Brassicaceaea						
Lepidium monoplocoides[2]	Winged Pepper-cress	E	E	Occurs on seasonally moist to waterlogged sites, on heavy fertile soils, with a mean annual rainfall of around 300-500 mm. Predominant vegetation is usually an open woodland dominated by *Allocasuarina luehmannii* (Bulloak) and/or eucalypts, particularly *Eucalyptus largiflorens* (Black Box) or *Eucalyptus populnea* (Poplar Box). The field layer of the surrounding woodland is dominated by tussock grasses.[a]	Predicted by EPBC Search	Low. Soils at site too light (sandy loams) and too well-drained.
Fabaceae Subf Faboides						
Swainsona murrayana[2]	Slender Darling-pea, Slender Swainson, Murray Swainson-pea	V	V	The species has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with *Maireana* species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated.[a]	Predicted by EPBC Search	Low-medium. Soils at site may be too light (sandy loams).
Swainsona pyrophila[2]	Yellow Swainson-pea	V	V	Grows in mallee scrub on sandy or loamy soil, usually found only after fire. Sites include cleared and burnt mallee scrub on red loam to sand, previously burnt *Eucalyptus dumosa* mallee, disturbed woodland in sheltered aspects, a bulldozed firebreak adjacent to wheat paddocks, roadsides, claypans and at the edge of fire ash.[a]	Predicted by EPBC Search	Medium. Suitable habitat across site, however no evidence of recent fire.

Appendix A Species Lists

Botanical Name	Common Name	*TSC Act* Status	*EPBC Act* Status	Habitat Requirements	Previous Records	Potential Occurrence at the Site
Santalaceae						
Santalum murrayanum[1]	Bitter Quandong	E1		*Santalum* species are root-parasitic shrubs or small trees. NSW populations found in mallee habitats on soft linear dune-crests, with deep and well-drained calcareous earths or red and brown sands, loamy sands or clay-loams. Associated species include *Eucalyptus socialis* and *Pimelea microcephala*. Also recorded in gravely and sandy loam soils on dunes, in open woodland , tall shrubland and in sand in spinifex-shrub steppe.[a]	Recent NPWS Wildlife Atlas record within 10km of site.	Medium. Suitable habitat across site.
Solanum karsense[2]	Menindee Nightshade	V	V	Grows in occasionally flooded depressions with heavy soil, including level river floodplains of grey clay with Black Box and Old Man Saltbush, and open treeless plains with solonized brown soils. Habitats are generally lake beds or floodplains of heavy grey clays with a highly self-mulching surface. Also found on sandy floodplains and ridges and in calcareous soils, red sands, red-brown earths and loamy soils. Vegetation types include saltbush and bluebush plains and mallee associations. Associated species include *Morgania floribunda, Myriocephalus stuartii, Minuria denticulata and Maireana pyramidata.*[a]	Predicted by EPBC Search	Low. Soils at site too light (sandy loams) and too well-drained.

Appendix A Species Lists

Botanical Name	Common Name	*TSC Act* Status	*EPBC Act* Status	Habitat Requirements	Previous Records	Potential Occurrence at the Site
Endangered Ecological Communities						
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions[2]	Buloke Woodlands	EEC*	EEC	The woodlands are distributed widely across the bioregions, occurring in tracts or as patches within open forests or woodlands dominated by other species. A feature common to many areas where the woodlands occur is the presence of clayey and/or alkaline sub-soils. In many of the South Australian areas, massive calcrete underlies the sub-soil at depths of less than one metre.[b]	Predicted by EPBC Search	Medium. Suitable habitat across site.
Aquatic ecological community in the natural drainage system of the lower Murray River catchment [3]	Lower Murray ecological community	EEC		Occurs in a lowland riverine environment characterised by meandering channels and wide floodplains. In their natural state, these lowland rivers experienced extremely variable water flows, ranging from floods to droughts. Lowland rivers provide a wide range of habitats for fish and invertebrates, including pools, runs or riffles, backwaters and billabongs, snags, and aquatic plants. Floodplains also provide a mosaic of habitat types, including permanent and temporary wetlands and terrestrial habitats.[a]	Occurs in CMA sub-region.	Low. No drainage lines or depressions within vicinity of site.

1 =Threatened species listed under TSC Act 1995 previously recorded within 10km of the Site.
2 = Threatened species or species habitat listed under EPBC Act 1999 in local area.
3= EEC found in the same CMA sub-region as the Site.
V= Vulnerable species listed on TSC/EPBC acts.
E1= Endangered species listed on TSC act
E = Endangered species listed on EPBC Act
EEC = Endangered Ecological Community listed on TSC/EPBC Acts
EEC* = preliminary determination for listing as EEC on TSC Act
a = DECC threatened species profile (http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/browse_allspecies.aspx?kingdom=community)
b = EPBC Act Species profiles and threats database (http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=3)
c = National Herbarium Flora Online (http://plantnet.rbgsyd.nsw.gov.au/search/simple.htm)

Appendix A Species Lists

Table 2: Threatened fauna taxa recorded or predicted to occur in the locality

Scientific Name	Common Name	*TSC Act* status	*EPBC Act* Status	Habitat Requirements	Previous Records	Potential Occurrence at the Site
Amphibia						
Litoria raniformis[2]	Growling Grass Frog, Southern Bell Frog, Warty Bell Frog, Green and Golden Frog	E	V	Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat. Requires still or very slow flowing water[a,c]	Predicted by EPBC Search	Low. No permanent aquatic habitats in study area.
Aves						
Manorina melanotis[2]	Black-eared Miner	E	E	Birds are restricted to large tracts (30,000ha or greater) of mature, unfragmented mallee on the more fertile soils. Occupies vegetation with a post fire age of greater than 25 years, but is most abundant in areas with a post fire age of 50 years or more.[a]	Predicted by EPBC Search	Medium. Suitable foraging habitat in mallee on site however patches may be too small, disturbed and fragmented.
Rostratula australis[2]	Australian Painted Snipe	E	V	Fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.[a]	Predicted by EPBC Search	Low-medium. May opportunistically use ephemeral wetland on site.
Melanodryas cucullata	Hooded Robin	V		Hooded Robins occupy a wide range of Eucalypt woodlands, Acacia shrublands and open forests. Home ranges are relatively large and average 30ha outside of the breeding season.	Recent NPWS Wildlife Atlas record within 10km of site	High. Currently uses the Site as roosting habitat.
Leipoa ocellata[1,2]	Malleefowl	E1	V	Mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300-450 mm mean annual rainfall) areas. Less frequently other eucalypt woodlands and Gidgee. Prefers areas of light sandy to sandy loam soils and habitats with a dense but discontinuous canopy, dense and variable shrub and herb layers.[a]	Recent NPWS Wildlife Atlas record within 10km of site	Medium. Suitable habitat on site but canopy and shrub layers may be too sparse and discontinuous to provide optimum habitat.

Appendix A Species Lists

Scientific Name	Common Name	*TSC Act* status	*EPBC Act* Status	Habitat Requirements	Previous Records	Potential Occurrence at the Site
Burhinus grallarius	Bush Stone-curlew	E1		Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights. Feed on insects and small vertebrates, such as frogs, lizards and snakes.[a]	Recent NPWS Wildlife Atlas record within 15km of site	High. Suitable foraging habitat present on site.
Cacatua leadbeateri[1]	Major Mitchell's Cockatoo	V		A wide range of treed and treeless inland habitats, always within easy reach of water.Feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines. Nests in hollows. [a]	Recent NPWS Wildlife Atlas record within 10km of site	High. Likely to utilise foraging habitat on site on an intermittent basis.
Ninnox connivens[1]	Barking Owl	V		Inhabits eucalypt woodland, open forest, swamp woodlands and, especially in inland areas, timber along watercourses. Denser vegetation is used occasionally for roosting. [a]	Recent NPWS Wildlife Atlas record within 20km of site	Medium May utilise foraging habitat on site during excursions from roosting habitat along the Murray River.
Polytelis anthopeplus monarchoides[1,2]	Regent Parrot (eastern subsp.)	E1	V	The species nests within the redgum forest along the Murray and Wakool Rivers, and possibly the Darling River downstream of Pooncarrie. Typical nest trees are large, mature healthy trees with many spouts (though dead trees are used), typically located close to a watercourse. Principal foraging habitat is mallee woodlands, though foraging also occurs in riverine forests and woodlands. Mallee woodland within 20km of nesting sites is critical foraging habitat for breeding birds. Birds move between the riverine nesting habitat and foraging sites along corridors of natural vegetation.[a]	Recent NPWS Wildlife Atlas record within 10km of site	High. Likely to utilise foraging habitat on site during excursions from nesting habitat along the Murray River.
Cinclosoma castanotus[1]	Chestnut Quail-thrush	V		Wide range of arid and semi-arid habitats; mainly in the low shrubs and undergrowth of mallee scrub, but also in Acacia scrubs, dry sclerophyll woodland, heath, and native pine. Occupies vegetation with a post fire age of 4-40 years, however	Recent NPWS Wildlife Atlas record within 10km of site	High. Suitable foraging habitat present on the site.

Appendix A Species Lists

Scientific Name	Common Name	*TSC Act* status	*EPBC Act* Status	Habitat Requirements	Previous Records	Potential Occurrence at the Site
				is most abundant in areas more recently burnt. Forages on the ground, often among spinifex clumps, on invertebrates. [a]		
Mammalia						
Ningaui yvonneae[1]	Southern Ningaui	V		Mallee woodland in south-western corner of NSW. Shelters beneath logs, dense vegetation and may dig its own burrows. Nocturnal and preys on a wide range of arthropods. [a]	Recent NPWS Wildlife Atlas record within 10km of site	Medium. Mallee on site may provide foraging habitat but is limited by the lack of mature spinifex clumps.
Nyctophilus timoriensis (South-eastern form)[2]	Eastern Long-eared Bat		V	Inhabits a variety of vegetation types, including mallee, bulloke *Allocasuarina leuhmanni* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.[a]	Predicted by EPBC Search	High. Suitable foraging and roosting habitat on site.
Osteoicthes						
Craterocephalus fluviatilis[2]	Murray Hardyhead	E	V	Murray hardyheads live along the edges of slow-flowing lowland rivers and in lakes, billabongs and backwaters. They are often found amongst aquatic weeds, in both fresh and quite saline waters.[a]		Low. No permanent aquatic habitat on site.
Maccullochella peelii peelii[2]	Murray Cod, Cod, Goodoo		V	The Murray Cod is sedentary and territorial rather than free ranging, and has a distinct preference for woody debris (snags), debris piles and bank side vegetation that provides shelter from high water velocities.[b]	Predicted by EPBC Search	Low. No permanent aquatic habitat on site.

Appendix A Species Lists

Scientific Name	Common Name	*TSC Act* status	*EPBC Act* Status	Habitat Requirements	Previous Records	Potential Occurrence at the Site
Reptilia						
Aprasia inaurita[1]	Mallee Worm-lizard	E1		Inhabits semi-arid mallee woodlands on red sands. Often shelters in sand, beneath mallee stumps, in leaf litter or in the nests of ants and other insects. Thought to be dependent on Spinifex (*Triodia scariosa*). Feeds on the eggs of small black ants of the genus *Aphaenogaster*. a	Recent NPWS Wildlife Atlas record within 10km of site	Medium. Mallee on site may provide foraging habitat but is limited by the lack of mature spinifex clumps

1 =Threatened species listed under TSC Act 1995 previously recorded within 10km of the Site
2 = Threatened species or species habitat listed under EPBC Act 1999 predicted to occur in local area.
V= Vulnerable species listed on TSC/EPBC acts.
E1= Endangered species listed on TSC act
E = Endangered species listed on EPBC Act
a = DECC threatened species profile (http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/browse_allspecies.aspx?kingdom=community)
b= Bishop, T (1996), *Field Guide to the Orchids of NSW*, UNSW press.
C = Ehmann, H (1997), *Threatened frogs of NSW: Habitats, Status and Conservation,* Frog and Tadpole Study Group.

Appendix A Species Lists

Table 3: Plant species recorded during the August 2007 survey

Family	Scientific name	Common name
Aizoaceae		
	Aizoaceae sp.	
	*Psilocaulon tenue**	Wiry Noon flower
	Tetragonia tetragonoides	New Zealand Spinach
Apiaceae		
	Daucus glochidiatus	Native Carrot
Asphodelaceae		
	*Asphodelus fistulosus***	Onion Weed
Asteraceae		
	Brachyscome lineariloba	Hard-headed Daisy
	Calotis hispidula	Bogan Flea
	Rhodanthe pygmaeum	Pigmy Sunray
Boraginaceae		
	*Echium sp**	
Brassicaceae		
	*Brassica tournefortii**	Mediterranean Turnip
	*Carrichtera annua**	Ward's Weed
	Sisymbrium erysimoides	Smooth Mustard
	*Sisymbrium irio**	London Rocket
Casuarinaceae		
	Casuarina pauper	Belah
Chenopodiaceae		
	Dissocarpus paradoxus	Cannonball Burr
	Einadia nutans subs *nutans*	Climbing Saltbush
	Enchylaena tomentosa	Ruby Saltbush
	Maireana pyramidata	Black Bluebush
	Rhagodia spinescens	
	Sclerolaena diacantha	Grey Copperburr

Appendix A Species Lists

Euphorbiaceae		
	Chamaesyce drummondii	Caustic Weed
Fabaceae		
	*Medicago minima**	Woolly Burr Medic
Fabaceae		
	Acacia colletioides	Wait-a-while
Geraniaceae		
	Erodium crinitum	Blue Storksbill
Lamiaceae		
	*Salvia verbenacea**	Wild Sage
Myrtaceae		
	Eucalyptus largiflorens	Black Box
	Eucalyptus socialis	Red Mallee
Poaceae		
	*Hordeum leporinum**	Barley Grass
	*Schismus barbatus**	Arabian Grass
Portulacaceae		
	Calandrinia eremaea	
Scrophulariaceae		
	*Verbascum virgatum**	Twiggy Mullein
Solanaceae		
	*Lycium ferocissimum***	African Boxthorn
Sapindaceae		
	Alectryon oleifolius subsp. elongatus	Western Rosewood
Typhaceae		
	Typha orientalis	Broadleaf Cumbungi
Zygophyllaceae		
	Zygophyllum apiculatum	Gallweed, Pointed or Common Twinleaf
	Zygophyllum iodocarpum	Violet Twinleaf

* Exotic
**Declared noxious weed for Wentworth LGA.

Appendix A Species Lists

Table 4: Fauna species recorded during the August 2007 survey

Common Name	Scientific Name
Aves	
Inland Thornbill	*Acanthiza apicalis*
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*
Slender-billed Thornbill	*Acanthiza iredalei*
Yellow Thornbill	*Acanthiza nana*
Chestnut-rumped Thornbill	*Acanthiza uropygialis*
Southern Whiteface	*Aphelocephala leucopsis*
Wedge-tailed Eagle	*Aquila audax*
Australian (Mallee) Ringneck	*Barnardius zonarius barnardi*
Black-eared Cuckoo	*Chalcites osculans*
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*
White-winged Chough	*Corcorax melanorhamphos*
Australian Raven	*Corvus coronoides*
Grey Butcherbird	*Cracticus torquatus*
Pallid Cuckoo	*Cuculus pallidus*
Emu*3*	*Dromaius novaehollandiae*
Galah	*Eolophus roseicapillus*
Spotted Nightjar	*Eurostopodus argus*
Nankeen Kestrel	*Falco cenchroides*
Western Gerygone	*Gerygone fusca*
Magpie-lark	*Grallina cyanoleuca*
Australian Magpie	*Gymnorhina tibicen*
Little Eagle*3*	*Hieraaetus morphnoides*
Welcome Swallow	*Hirundo neoxena*
White-eared Honeyeater	*Lichenostomus leucotis*
Yellow-plumed Honeyeater	*Lichenostomus ornatus*
White-plumed Honeyeater	*Lichenostomus penicillatus*
Yellow-throated Miner	*Manorina flavigula*
Hooded Robin	*Melanodryas cucullata*[1]
Brown-headed Honeyeater	*Melithreptus brevirostris*
Rainbow Bea-eater	*Merops ornatus*
Black Kite	*Milvus migrans*
Restless Flycatcher	*Myiagra inquieta*

Appendix A Species Lists

Common Name	Scientific Name
Southern Boobook	*Ninox boobook*
Blue Bonnet[3]	*Northiella haematogaster*
Crested Pigeon	*Ocyphaps lophotes*
Rufous Whistler	*Pachycephala rufiventris*
Spotted Pardalote	*Pardalotus punctatus*
Striated Pardalote	*Pardalotus striatus*
Red-capped Robin	*Petroica goodenovii*
Tawny Frogmouth	*Podargus strigoides*
Red-rumped Parrot	*Psephotus haematonotus*
Mulga Parrot	*Psephotus varius*
Willie Wagtail	*Rhipidura leucophrys*
Weebill	*Smicrornis brevirostris*
Apostlebird	*Struthidea cinerea*
Mammalia	
Brown Hare	*Lepus capensis**
Western Grey Kangaroo[3]	*Macropus fuliginosus*
European Rabbit	*Oryctolagus cuniculus*
Sheep	*Ovis aries**
White-striped Mastiff Bat	*Tadarida australis*
Southern Freetail Bat *(long penis form)*	*Mormopterus planiceps*
Inland Freetail Bat	*Mormopterus sp.4*
Gould's Wattled Bat	*Chalinolobus gouldii*
Chocolate Wattled Bat	*Chalinolobus morio*
Little Pied Bat[1]	*Chalinolobus picatus*
Large-footed Myotis[1]	*Myotis adversus macropus*
Long-eared Bat	*Nyctophilus sp.*
Large Forest Bat	*Vespadelus darlingtoni*
Southern Forest Bat	*Vespadelus regulus*
Little Forest Bat	*Vespadelus vulturnus*
Fox	Oryctolagus cuniculus
Dog	Canis familiaris
Reptilia	
Shingleback Lizard	*Tiliqua rugosa*
Central Bearded Dragon[3]	*Pogona vitticeps*
Prickly Gecko	*Heteronotia binoei*
Thick-tailed Gecko	*Underwoodisaurus milii*

Appendix A Species Lists

Common Name	Scientific Name
Shiny-palmed Shinning-skink	*Cryptoblepharus carnabyi*
South-eastern Morethia Skink	*Morethia boulengeri*
Unidientified Ctenotus sp.	*Ctenotus* sp.
Parastacidea	
Yabby	*Cherax sp.*

1 = Threatened species listed under TSC Act 1995
2 = Threatened species listed under EPBC Act 1999
* = exotic
[3] recorded at reference site (Mallee Cliffs NP).

Appendix B Assessment of Significance

Appendix B 7-Part Tests

B.1 Transient, seasonal or migratory species

B.1.1 Background Ecology

This assessment is for TSC/EPBC Act listed species which are predicted to occur within the study area, based on habitat assessments conducted during the URS (2007) field surveys. No individuals of these species were recorded. Further, no evidence such as recent records in the immediate vicinity of the Site or important habitat for these species was observed. However these species may occupy the study area on a transient, seasonal or migratory basis and so Section 5A (s.5A) of the EP&A Act has been addressed.

Table 2 of **Appendix A** lists TSC/EPBC Act listed species which may occur within the study area along with their habitat requirements and an assessment of the likelihood of their occurrence. This 7-part Test of significance was performed for species with a medium or high likelihood of occurrence in the study area. These include:

Burhinus grallarius Bush Stone-curlew;
Polytelis anthopeplus monarchoides Regent Parrot (eastern subsp.);
Cacatua leadbeateri Major Mitchell's Cockatoo;
Cinclosoma castanotus Chestnut Quail-thrush.
Ninnox connivens Barking Owl;
Aprasia inaurita Mallee Worm-lizard;
Ningaui yvonneae Southern Ningaui;
Manorina melanotis Black-eared Miner; and
Leipoa ocellata Malleefowl.

B.1.2 Seven Part Test

a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

There is no evidence of, a 'viable local population' of any of the above-listed threatened fauna species inhabiting the Site on a permanent basis. Hence, the proposed development is not likely to have an adverse effect on the life cycle of any such species such that it could be placed at risk of extinction.

b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

In the case of an endangered population, there is no evidence for any of the listed endangered populations that are recorded from the locality occurring within the study area. Accordingly, the proposed action is not likely to have an adverse effect on any such population such that it could be placed at risk of extinction.

c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable.

Appendix B 7-Part Tests

d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

(i) Approximately 4ha of habitat will be removed by the proposed development, including potentially important resources such as standing and fallen timber and hollow-bearing trees. The loss of this vegetation and operation of the facility may also result in modification of adjacent areas of intact habitat by reducing the overall patch size and through noise and light fall.

(ii) The proposal will not result in a significant area of habitat becoming fragmented or isolated. Native vegetation in the surrounding region has been modified by historical clearing and grazing. Intact native vegetation features a matrix of treed and treeless vegetation communities such as Chenopod Shrubland. North-south fauna movement corridors are already disrupted by the existing TransGrid switching station and east-west corridors by Arumpo Road. The proposed plant site abuts these two features and so would not constitute a significant additional barrier.

In this context the removal of 4ha of vegetation is unlikely to constitute a barrier to fauna movement.

(iii) The habitat to be removed is likely to be of minor importance to local populations of the above-listed species in the context of large areas of intact vegetation in the surrounding region.

e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

The proposed development is not likely to have an adverse effect on critical habitat (either directly or indirectly) as there is no critical habitat currently listed on the register of relevance to the site.

f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The proposed development is not likely to be inconsistent with the objectives or actions of a recovery plan for any transitory or migratory threatened fauna species as it is not likely to directly affect any of these species. Environmental management measures will be implemented in order to minimise impacts on potential habitat for threatened fauna in the locality and these measures are likely to be consistent with any relevant threat abatement plans.

g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Construction of the Peaking Power Plant will result in the operation of the following Key Threatening Processes listed in Schedule 3 of the *TSC Act*, may be relevant to the current proposal: ‘

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

These processes have been addressed in ‘Part a’ and ‘Part d’ of this assessment.

Appendix B 7-Part Tests

B.1.3 Section 5a Assessment Conclusion

Given the consideration of the above seven factors, it is not 'likely' that construction of the facility will result in 'a significant effect' on threatened fauna species that may utilise the Site on a transitory, seasonal or migratory basis.

B.2 Hooded Robin

B.2.4 Background Ecology

Distribution

The Hooded Robin is common in few places, and rarely found on the coast. It is considered a sedentary species, but local seasonal movements are possible. The south-eastern form is found from Brisbane to Adelaide throughout much of inland NSW, with the exception of the north-west. The species is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania (DECC, 2007b).

Habitat and ecology

The Hooded Robin prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. It requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. As is typical for Australian robin species it perches on low dead stumps and fallen timber or on low-hanging branches, using a perch-and-pounce method of hunting insect prey (DECC, 2007b). Hooded Robins breed in monogamous pairs and are sedentary within home ranges. Territories range from 5-10 ha during the breeding season, to 30 ha in the non-breeding season (BIBY, 2007).

Hooded Robins typically breed between August and November, often rearing several broods. The nest is a small, neat cup of bark and grasses bound with webs, in a tree fork or crevice, from less than 1 m to 5 m above the ground. The nest is defended by both sexes. A clutch of two to three is laid and incubated for 14 or 15 days by the female. Young remain in the nest for 13 days (BIBY, 2007). Young from previous clutches often cooperate with adult pairs in brooding and defending breeding territories (Bell, 1983).

Established pairs keep to their territory year round, banding into family groups only briefly after breeding (ACT Govt, 1999). Bell (1983) observed breeding and dispersal behaviour of Hooded Robins over three years. A single adult pair occupied a home range of ca. 6 ha during the breeding season, which expanded to ca. 30 ha during the non-breeding period. The pair relocated their nest site each season with varying breeding success depending on the location of the nest. Nests on open horizontal branches failed whereas a nest on a hollow stump amongst shelter was successful**.** The pair's single, male offspring remained within the home range the following season.

Local occurrence

A breeding pair of Hooded Robins were observed at the site repeatedly over a two day period during the August 2007 field surveys. A breeding pair was observed again in the October 2007 survey - probably the same two individuals as seen in August. The pair had a nest within the plant footprint as shown on **Figure 5,** which contained at least one nestling at the time of the survey. This pair of adults is likely to occupy a home range of 5-6ha centred on the nest at present, which would expand to 25-30ha outside the breeding season (ACT Govt, 1999; Bell, 1983). It is likely that the entire development footprint of 4ha falls within this range.

There are 2 previous NPWS Atlas records within 10km of the Site and 8 within 20km (DECC, 2007a). The Birds Australia (2007) Birdata Atlas shows several recent records within 15km of the site.

Appendix B 7-Part Tests

B.2.5 The Seven Part Test

a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

The proposed development is unlikely to have an adverse effect on the life cycle of the species provided that the mitigation measures outlined in **Section 7** are adopted. Specifically: timing of construction outside the breeding period, a detailed pre-clearing survey and avoidance of breeding individuals. The plant site footprint will have a major impact on the birds' 2007 breeding range however their home range would expand to up to 30ha outside the breeding season. The breeding range in subsequent seasons may not occupy the same area (ACT Govt, 1999; Bell, 1983). Equivalent areas of habitat are available adjacent to the Site. Further, breeding pairs are not known to use the same nest in subsequent breeding seasons (pers. comms.P Ewan NPWS).

Bell (1983) found that appropriate nesting sites were critical to breeding success. The pair observed in October 7 were nesting in a fork in a mature *Casuarina cristata* in Belah Woodland and had successfully hatched at least one offspring. Equivalent nesting resources are present in good quantities elsewhere in the Site and the local area.

b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

Not applicable.

c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable.

d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

(i) Construction at the plant site will remove approximately 4ha of habitat for the species including important foraging habitat in native vegetation, important roost and perch-and-pounce sites on standing and fallen timber and suitable nest sites.

(ii) The proposal will not result in a significant area of habitat becoming fragmented or isolated. The Hooded Robin is a mobile species and the local population has maintained its presence around existing features such as the substation and Arumpo Road. Further, native vegetation in the surrounding region has been modified by historical clearing and grazing and features a matrix of treed and treeless vegetation communities such as Chenopod Shrubland.

A small area of habitat between the plant site and the existing substation will be partially restricted from north-south movements but an east-west corridor will be maintained.

(iii) The importance of the habitat to be removed cannot be definitively assessed without knowledge of the breeding pair's movements over successive seasons.

The plant site footprint will have a major impact on the birds' 2007 breeding range however their home range would expand to up to 30ha outside the breeding season. The breeding range in subsequent seasons may not occupy the same area (ACT Govt, 1999; Bell, 1983). Equivalent areas of habitat are available adjacent to the Site.

A pre-clearing survey will be required to determine if the local population of Hooded Robins shows fidelity to the 2007 breeding home range. This will help determine the importance of the habitat to be removed.

e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

The study area is not listed as critical habitat under Part 3 Division 1 of the Threatened Species Conservation Act 1995.

f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The action proposed is not consistent with the objective: protect all woodland in which Hooded Robins are known to be resident from clearing as stated within The Action Plan for Australian Birds 2000 (Environment Australia, 2000). The proposal will result in the removal of a small area of Hooded Robin habitat (approx. 4ha) however due to the presence of suitable habitat surrounding the Site, the clearing of woodland as a result of the proposal is unlikely to have a significant impact on the species.

g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Construction of the Peaking Power Plant will result in the operation of the following Key Threatening Processes listed in Schedule 3 of the *TSC Act*, may be relevant to the current proposal: '

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

These processes have been addressed in 'Part a' and 'Part d' of this assessment.

B.2.6 Section 5A Assessment

Given the consideration of the above seven factors, it is not 'likely' that construction of the Peaking Power Plant will result in 'a significant effect' on the local population of the Hooded Robin provided the appropriate mitigation measures outlined in **Section 7** are adopted.

B.3 Threatened Microbats

This assessment is for TSC/EPBC Act listed microchiropteran bats (microbats) which were recorded during the URS (2007) field surveys or are predicted to occur within the study area. Two species were recorded at the site:

Myotis adversus Large-footed Myotis; and

Chalinolobus picatus Little Pied Bat.

The distribution, ecology and local occurrence of these species is addressed below.

There are no previous NPWS Atlas records of threatened microbats within 10km of the Site (DECC, 2007). Two listed microbats are known from Wentworth LGA (DECC, 2007) and may occupy the study area on a transient, seasonal or migratory basis:

Vespadelus baverstocki Inland Forest Bat; and

Nyctophilus timoriensis Eastern Long-eared Bat (South-eastern form).

Section 5A (s.5A) of the EP&A Act has been addressed for threatened microbats collectively.

Appendix B 7-Part Tests

B.3.7 Background Ecology

Distribution

Large-footed Myotis

The Large-footed Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to New South Wales and western Victoria. It is rarely found more than 100km inland except along major rivers. The distribution is known to extend inland from coastal South Australia along the Murray River [(DEC 2005), Environment Australia (EA) (1999)]

Little Pied Bat

The Little-Pied Bat is found in inland Queensland and NSW (including Western Plains and slopes) extending slightly into South Australia and Victoria. Despite a commonly held view that the species has an inland distribution, there are a number of records from south-eastern Queensland within 50 km of the coast (Cordalba State Forest and Eurimbula National Park), and a recent record from a sea cave north of Townsville. No evidence exists that the range has contracted [(DEC 2005), Environment Australia (EA) (1999)]

Habitat and ecology

Large-footed Myotis

The Large-footed Myotis generally roosts in groups of 10-15 close to water in caves, buildings, under bridges, and in dense foliage. This species is always associated with permanent, usually slow-flowing, water bodies. It has been recorded foraging over small creeks, coastal rivers, estuaries, lakes and inland rivers. Records come from a wide range of vegetation communities associated with water. Recent literature review also suggests that this species can utilise farm dams and other smaller water bodies. It forages over streams and pools catching insects and small fish by raking their feet across the water surface. In NSW females have one young each year usually in November or December [(DEC 2005), Environment Australia (EA) (1999)]

Little Pied Bat

Occurs most frequently in dry open forest, open woodland, mulga woodlands, chenopod shrublands, cypress-pine forest, mallee and Bimbil box. In the more arid parts of its range in Queensland, New South Wales and South Australia it has been recorded from mulga (Acacia aneura) woodlands, from patches of Eucalyptus largiflorens woodlands (New South Wales) and riverine E. camaldulensis dominated communities [(DEC 2005), Environment Australia (EA) (1999)]

This species was originally thought to be an obligate cave-dwelling species and therefore rare due to the scattered and infrequent occurrence of suitable roosting and maternity sites across its range. However, colonies are now known to roosts in caves, rock outcrops, mine shafts, tunnels, tree hollows and disused buildings (particularly those with open timber frames). Surveys have indicated that in arid and semi-arid environments the species may be locally common near permanent or semi-permanent water. The species can tolerate high temperatures and dryness but need access to nearby open water. It feeds on moths and possibly other flying invertebrates [(DEC 2005), Environment Australia (EA) (1999)]

Local occurrence

Large-footed Myotis

The Large-footed Myotis was recorded by Anabat echolocation detector during the URS October (2007) Spring survey. The species was recorded at multiple locations over two evenings however more typically favours foraging habitat in and around semi-permanent waterways (DECC, 2007b). Local populations of the species are most likely to be centred on the Murray River, dams and irrigation channels to the south of the Site. The species may forage at the site on an occasional basis and potentially also use hollow-bearing trees at the site as diurnal roosts.

There are no previous NPWS Atlas records within 10km of the Site or for Wentworth LGA (DECC, 2007).

Appendix B 7-Part Tests

Little Pied Bat

The Little Pied Bat was recorded by Anabat echolocation detector during the URS October (2007) Spring survey. The species was recorded at multiple locations over three evenings. There is suitable foraging and roosting habitat for the species and access to permanent water within 10km of the Site. A local population of the species is likely to regularly utilise foraging habitat at the site and may also use hollow-bearing trees as diurnal roosts.

There are no previous NPWS Atlas records within 10km of the Site though the species is known from Wentworth LGA (DECC, 2007).

B.3.8 Seven Part Test

a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

The proposed development is unlikely to have an adverse effect on the life cycle of microbat species provided that the mitigation measures outlined in **Section 7** are adopted. Specifically: timing of construction outside the breeding period and a detailed pre-clearing survey including stag-watching of hollow-bearing trees. This should ensure that no maternity colonies of threatened microbats are present during clearing and construction at the Site.

The removal of hollow-bearing trees may result in a reduction in the number of potential maternity-colony sites for the species in the local area. Vegetation in the locality and especially in *E. camaldulensis* forest to the south of the site contains large numbers of hollow-bearing trees equivalent or superior to resources at the site. Therefore the loss of potential maternity-colony sites as a result of the development is unlikely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

Not applicable.

c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable.

d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

(i) Construction at the plant site will remove approximately 4 ha of habitat for the species including foraging habitat, important diurnal roost sites in hollow-bearing trees and exfoliating bark and potential maternity colony sites.

(ii) The proposal will not result in a significant area of habitat becoming fragmented or isolated. Microbats are mobile species and local populations have maintained their presence around existing features such as the substation and Arumpo Road.

(iii) The habitat to be removed is likely to be of minor importance to local populations of threatened microbats in the context of large areas of intact vegetation in the surrounding region.

Individual hollow-bearing trees may have increased importance to local populations on a seasonal or occasional basis, such as during winter hibernation or during breeding. A pre-clearing survey will be required to determine if the development footprint contains any large aggregations of roosting-bats.

e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

The study area is not listed as critical habitat under Part 3 Division 1 of the Threatened Species Conservation Act 1995.

f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There are currently no recovery plans or threat abatement plan prepared for the microbats addressed in this assessment.

There are however a number of recovery strategies which have been identified to help recover these species in NSW. The proposal is generally not consistent with these strategies. Inconsistencies relate to: the retention of hollow-bearing trees and provision for hollow-bearing tree recruitment; retaining foraging habitat; retaining stands of native vegetation; and retaining native vegetation around water bodies.

g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Construction of the Peaking Power Plant will result in the operation of the following Key Threatening Processes listed in Schedule 3 of the *TSC Act*, may be relevant to the current proposal: ‘

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

These processes have been addressed in ‘Part a’ and ‘Part d’ of this assessment.

B.3.9 Section 5a Assessment Conclusion

Given the consideration of the above seven factors, it is not ‘likely’ that construction of the Peaking Power Plant will result in ‘a significant effect’ on the local populations of threatened microbats provided the appropriate mitigation measures outlined in **Section 7** are adopted.

Appendix B 7-Part Tests

B.4 References

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