

Scientific Name	Common name	Status		Preferred Habitat	Likelihood of Habitat Suitable for Species Within or Adjacent to Study Area	Recorded During Field Survey	Further Assessment Required
		EPBC*	TSC^				
				as ferns, sedges or grasses. Adults occur on or near cobble banks and other rock structures within stream margins. Shelter under rocks or amongst vegetation near the ground on the stream edge.			
<i>Litoria raniformis</i>	Southern Bell Frog	V	E	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.	Unlikely	No	No
INVERTEBRATES							
<i>Synemon plana</i>	Golden Sun Moth	CE	E	Restricted within the Upper Slopes to a radius of 15 k west of Binalong and eastwards to the subregion's eastern-most boundary; and in a radius of 15 km from Tumut. Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which the ground layer is dominated by wallaby grasses Austrodanthonia spp.	Unlikely	No	No
MAMMALS							
<i>Cercartetus nanus</i>	Eastern Pygmy-possum		V	Broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but most commonly in woodlands and heath.	Possible	No	Yes

Scientific Name	Common name	Status		Preferred Habitat	Likelihood of Habitat Suitable for Species Within or Adjacent to Study Area	Recorded During Field Survey	Further Assessment Required
		EPBC*	TSC^				
				Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum (<i>Pseudocheirus peregrinus</i>) dreys or thickets of vegetation, (e.g. grass-tree skirts).			
<i>Chalinolobus picatus</i>	Little Pied Bat		V	Dry open forest, open woodland, mulga woodlands, chenopod shrublands, cypress-pine forest, mallee, Bimbil box. Roosts in caves, rock outcrops, mine shafts, tunnels, tree hollows and buildings.	Possible	No	Yes
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	E	V	Range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest. They utilise hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites	Possible	No	Yes
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat		V	Forested areas. Roosts in caves but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	Possible	No	Yes
<i>Myotis macropus</i> (formally <i>Myotis adversus</i>)	Large-footed Myotis		V	Forages over waterbodies (including streams, lakes or reservoirs) and vegetation within 20 m of waterbody. Roosts and breeds in live or dead hollow-bearing trees, under bridges or other artificial structures, in caves, or in dense foliage.	Possible	No	Yes
<i>Nyctophilus</i>	Greater	V	V	Variety of vegetation	Possible	No	Yes

Scientific Name	Common name	Status		Preferred Habitat	Likelihood of Habitat Suitable for Species Within or Adjacent to Study Area	Recorded During Field Survey	Further Assessment Required
		EPBC*	TSC^				
<i>corbeni</i> (formerly <i>N. timoriensis</i>)	Long-eared bat			types, including mallee, bulloak (<i>Allocasuarina leuhmanni</i>) and box eucalypt dominated communities. Roosts in tree hollows, crevices, and under loose bark			
<i>Petaurus australis</i>	Yellow-bellied Glider		V	Tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.	Possible	No	Yes
<i>Petaurus norfolcensis</i>	Squirrel Glider		V	Wide range of open forest, woodland and riverine forest habitats. Utilise remnants of various sizes, including small remnants and even small stands of trees within Travelling Stock Reserves, roadside reserves or private land. Often utilise linear remnant vegetation along roadsides or rivers and streams. Eucalypt species known to provide suitable denning and foraging resources include (but are not restricted to): Blakely's Red Gum (<i>E. blakelyi</i>), Grey Box (<i>E. microcarpa</i>), Red Box (<i>E. polyanthemos</i>), Mugga Ironbark (<i>E. sideroxylon</i>), River Red Gum (<i>E. camaldulensis</i>), White Box (<i>E. albens</i>) and Yellow Box (<i>E. melliodora</i>).	Possible	Possibly, <i>Petaurus</i> sp. recorded during field surveys.	Yes
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale		V	Dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabits heath, swamps, rainforest and wet	Possible	No	Yes

Scientific Name	Common name	Status		Preferred Habitat	Likelihood of Habitat Suitable for Species Within or Adjacent to Study Area	Recorded During Field Survey	Further Assessment Required
		EPBC*	TSC^				
				sclerophyll forest.			
<i>Phascolarctos cinereus</i>	Koala		V	Eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.	Possible	No	Yes
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail-bat		V	Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows.	Possible	No	Yes
REPTILES							
<i>Delma impar</i>	Striped Legless Lizard	V	V	Grassland dominated by perennial, tussock-forming grasses such as Kangaroo Grass (<i>Themeda australis</i>), spear-grasses (<i>Austrostipa</i> spp.) and poa tussocks (<i>Poa</i> spp.), and occasionally wallaby grasses (<i>Austrodanthonia</i> spp.). Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component.	Possible	No	Yes
<i>Aprasia parapulchella</i>	Pink-tailed Worm-lizard	V	V	Open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (<i>Themeda australis</i>).	Possible	No	Yes
<i>Varanus</i>	Rosenberg's		V	Heath, open forest and	Possible	No	Yes

Scientific Name	Common name	Status		Preferred Habitat	Likelihood of Habitat Suitable for Species Within or Adjacent to Study Area	Recorded During Field Survey	Further Assessment Required
		EPBC*	TSC^				
<i>rosenbergi</i>	Goanna			woodland. Associated with termites, the mounds of which this species nests in.			

* Status under the EPBC Act (CE- Critically Endangered, E- Endangered, V- Vulnerable); ^ Status under the TSC Act (E- Endangered, V- Vulnerable).

Table 10 Migratory Species Noted within EPBC Protected Matters Search with the Possibility to Occur within the Study Area.

Scientific Name	Common Name	Preferred Habitat	Presence Likelihood in Corridor	Observed During Field Surveys
<i>Apus pacificus</i>	Fork-tailed Swift	Low to very high airspace over varied habitat, rainforest to semi-desert.	Possible	No
<i>Ardea alba</i>	Great Egret	Wetlands, flooded pastures, dams.	Possible	No
<i>Ardea ibis</i>	Cattle Egret	Wetlands, flooded pastures, dams.	Possible	No
<i>Gallinago hardwickii</i>	Latham's Snipe	Open, freshwater wetlands with low, dense vegetation e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies	Possible	No
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle	Usually coastal, over islands, reefs and headlands, beaches, bays and estuaries, mangroves, lagoons and floodplains.	Possible	No
<i>Hirundapus caudacutus</i>	White-throated Needle-tail	Breed outside Australia. Low to very high, open airspace over almost any habitat, including oceans, forests and deserts. At times gather over ranges, headlands, often in humid, unsettled weather preceding thunderstorms.	Possible	No
<i>Leipoa ocellata</i>	Malleefowl	Mallee communities and less frequently eucalypt woodlands, mulga woodlands or cypress pine woodland.	Unlikely	No

Scientific Name	Common Name	Preferred Habitat	Presence Likelihood in Corridor	Observed During Field Surveys
<i>Merops ornatus</i>	Rainbow Bee-eater	Open country of woodlands, open forest, semi-arid scrub, grasslands, clearings in heavier forests, farmlands; avoids heavy forest. In breeding season, requires open clearing or paddock with loamy soil soft enough for nest tunnelling, yet firm enough to support the tunnel.	Possible	No
<i>Rostratula australis</i>	Australian Painted Snipe	Shallow inland wetlands, brackish or freshwater that are permanently or temporarily inundated	Possible	No
<i>Anthochaera phrygia</i>	Regent Honeyeater	Large tracts of box, ironbark, where there is good blossom.	Possible	No

* Listed as Migratory or Marine under the EPBC Act.

Table 11 Protected Environmental Values and Likelihood of Identified Potential Impacts to Threatened Species and Vegetation Communities Likely to Occur Within the Study Area.

Environmental Value	Sources of Potential Impacts													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
TSC THREATENED ECOLOGICAL COMMUNITIES														
White Box Yellow Box Blakely's Red Gum Woodland (box-gum Woodland)	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes	-	-	Yes	Yes	Yes
THREATENED FLORA SPECIES														
<i>Ammobium craspedioides</i> (Yass daisy)	Yes	-	-	-	-	Yes	Yes	-	-	-	-	Yes	-	Yes
<i>Leucochrysum albicans</i> var. <i>tricolor</i> (hoary sunray)	Yes	-	-	-	-	Yes	Yes	Yes	Yes	-	-	Yes	-	Yes
<i>Swainsona sericea</i> (silky Swainson-pea)	Yes	-	-	-	-	Yes	Yes	Yes	Yes	-	-	Yes	-	Yes
THREATENED FAUNA SPECIES														
BIRDS														
<i>Anthochaera phrygia</i> (<i>Xanthomya phrygia</i>) (regent honeyeater)	Yes	-	-	-	-	-	-	-	-	-	-	?	-	-
<i>Burhinus grallarius</i> (bush stone-curlew)	Yes	-	Yes	-	-	Yes	-	-	-	-	-	?	-	-
<i>Callocephalon fimbriatum</i> (gang-gang cockatoo)	Yes	Yes	-	-	-	-	-	-	-	-	-	?	-	-
<i>Calyptorhynchus lathamii</i> (glossy black-cockatoo)	Yes	Yes	-	-	Yes	-	-	-	-	-	-	Yes	-	-
<i>Circus assimilis</i>	Yes	-	-	-	-	Yes	Yes	Yes	Yes	-	-	?	-	-

Environmental Value	Sources of Potential Impacts													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(spotted harrier)														
<i>Climacteris picumnus victoriae</i> (brown treecreeper)	Yes	-	Yes	-	-	Yes	-	-	-	-	-	?	-	-
<i>Glossopsitta pusilla</i> (little lorikeet)	Yes	Yes	-	-	-	-	-	-	-	-	-	?	-	-
<i>Grantiella picta</i> (painted honeyeater)	Yes	Yes	-	-	-	-	-	-	-	-	-	?	-	-
<i>Grus rubicunda</i> (brilga)	Yes	-	-	-	-	Yes	-	-	-	-	Yes	?	-	-
<i>Lathamus discolor</i> (swift parrot)	Yes	Yes	-	-	-	-	-	-	-	-	-	?	-	-
<i>Lophoictinia isura</i> (square-tailed kite)	Yes	Yes	-	Yes	-	-	-	-	-	-	-	?	-	-
<i>Melanodryas cucullata cucullata</i> (hooded robin)	Yes	-	Yes	-	-	Yes	-	-	-	-	-	?	-	-
<i>Melithreptus gularis gularis</i> (black-chinned honeyeater)	Yes	-	-	-	-	-	-	-	-	-	-	?	-	-
<i>Neophema pulchella</i> (turquoise parrot)	Yes	Yes	Yes	-	-	Yes	-	-	-	-	-	?	-	-
<i>Ninox connivens</i> (barking owl)	Yes	Yes	Yes	-	-	-	-	-	-	-	-	Yes	-	-
<i>Pachycephala inornata</i> (Gilbert's whistler)	Yes	Yes	-	-	Yes	Yes	-	-	-	-	-	?	-	-
<i>Petroica phoenicea</i> (flame robin)	Yes	Yes	-	-	Yes	Yes	-	-	-	-	-	?	-	-
<i>Polytelis swainsonii</i> (superb parrot)	Yes	Yes	-	-	Yes	Yes	-	-	-	-	-	?	-	-
<i>Pomatostomus temporalis temporalis</i> (grey-crowned babbler)	Yes	-	Yes	-	-	Yes	-	-	-	-	-	?	-	-
<i>Pyrrholaemus sagittatus</i> (speckled warbler)	Yes	-	Yes	-	Yes	Yes	-	-	-	-	-	Yes	-	-
<i>Stagonopleura guttata</i> (diamond firetail)	Yes	-	Yes	-	-	Yes	-	-	-	-	-	Yes	-	-
MAMMALS														
<i>Cercartetus nanus</i> (eastern pygmy-possum)	Yes	Yes	-	-	Yes	-	-	-	-	Yes	-	?	-	-
<i>Chalinolobus picatus</i> (little pied bat)	Yes													

Environmental Value	Sources of Potential Impacts													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<i>Dasyurus maculatus</i> (spotted-tailed quall)	Yes	Yes	Yes	?	Yes	Yes	-	Yes	-	Yes	-	?	-	-
<i>Miniopterus schreibersii oceanensis</i> (eastern bentwing-bat)	Yes	Yes	-	-	-	-	-	-	-	-	-	-	-	-
<i>Myotis macropus</i> (formally <i>Myotis adversus</i>) (large-footed myotis)	Yes	Yes	-	-	-	-	-	-	-	-	-	-	-	-
<i>Nyctophilus timoriensis</i> (greater long-eared bat)	Yes	Yes	-	-	-	-	-	-	-	-	-	-	-	-
<i>Petaurus australis</i> (yellow-bellied glider)	Yes	Yes	-	-	Yes	-	-	-	-	-	-	Yes	-	-
<i>Petaurus norfolcensis</i> (squirrel glider)	Yes	Yes	-	-	Yes	-	-	-	-	-	-	Yes	-	-
<i>Phascogale tapoatafa</i> (brush-tailed phascogale)	Yes	-	Yes	-	Yes	-	-	Yes	-	-	-	Yes	-	-
<i>Phascolarctos cinereus</i> (koala)	Yes	-	-	-	Yes	-	-	-	-	-	-	Yes	-	-
<i>Saccolaimus flaviventris</i> (yellow-bellied sheath-tail-bat)	Yes	Yes	-	-	-	-	-	-	-	-	-	-	-	-
REPTILES														
<i>Delma impar</i> (striped legless lizard)	Yes	-	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes	-	Yes	Yes	Yes
<i>Aprasia parapulchella</i> (pink-tailed worm-lizard)	Yes	-	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes	-	Yes	Yes	Yes
<i>Varanus rosenbergi</i> (Rosenberg's goanna)	Yes	-	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes	-	Yes	Yes	Yes

Sources of potential impacts: 1 loss of vegetation; 2 Loss of hollow-bearing trees; 3 removal of dead and fallen timber; 4 removal of rock; 5 edge effects; 6 spread of environmental weeds; 7 easement maintenance; 8 soil excavation; 9 soil compaction; 10 barrier effects to wildlife movement; 11 alterations to hydrology; 12 wild fire; 13 construction waste; 14 sediment, erosion and dust.

Appendix B-B

TSC Act Section 5a Assessment (Seven Part Tests) for Threatened Ecological Communities and Species

Introduction

Seven-part Test assessments are the prescribed standard method for assessing the potential impacts of proposals to species listed as threatened and ecological communities listed as endangered pursuant to the TSC Act Section 5A. Under most circumstances a species or community that fails to meet the standards set in the Seven-part Test would trigger a requirement for the preparation of a Species Impact Statement. However, developments that are assessed under Part 3a of the EP&A Act (i.e. State Significant Developments) do not require Seven-part Tests. Nevertheless, the Seven-part Test provides a rigorous and standardised format for assessment, so it is used for that purpose in this report.

Desktop analysis identified a total of 44 threatened fauna species under the EPBC Act and / or the NCA Act which have been recorded or could potentially occur within the proposed proposal site (Table 9 in Appendix A). An assessment of potential habitat suggests that 34 threatened fauna species could have potential habitat within the proposal site. Seven-part tests were undertaken for all 34 fauna species and two flora species listed as threatened under the TSC Act that may have potential habitat in the proposal site.

The Seven-part Tests completed below follow a standardised format. They open with a brief review of the ecology and habitat requirements of the subject species or community and the threats it faces. The majority of this information has been taken from the threatened species pages of the DECC website (http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/home_species.aspx).

This is followed by responses to the seven test criteria (a) to (g):

- 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.*
- 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.*
- c) *In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed: (i) is the proposal 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 the proposal 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.*
- d) *In relation to the habitat of 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; (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat; 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.*
- e) *Whether the action proposed is likely to have an adverse effect on critical habitat.*
- f) *Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.*
- g) *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.*

Each test includes recommendations to mitigate any potential impacts to the species that were identified in the test. The mitigation recommendations given in the tests are expressed generally. The recommended mitigation measures are collated in Section 6.0, where more specific details are provided.

Box-Gum Woodland: Endangered	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	White Box Yellow Box Blakely's Red Gum Woodland (commonly referred to as Box-Gum Woodland) is listed as Endangered in part 3 of Schedule 1 of the NSW TSC Act. Box-gum Woodland is an open woodland community (sometimes occurring as a forest formation), in which the most obvious species are one or more of the following: <i>Eucalyptus albens</i>, <i>E. melliodora</i> and <i>E. blakelyi</i>. Intact sites contain a high diversity of plant species, including the main tree species, additional tree species, some shrub species, several climbing plant species, many grasses and a very high diversity of herbs. The community also includes a range of mammal, bird, reptile, frog and invertebrate fauna species. Intact stands that contain diverse upper and mid-storeys and groundlayers are rare. Modified sites include the following: - Areas where the main tree species are present ranging from an open woodland formation to a forest structure, and the groundlayer is predominantly composed of exotic species; and - Sites where the trees have been removed and only the grassy groundlayer and some herbs remain. Box-Gum Woodland is found from the Queensland border in the north, to the Victorian border in the south. It occurs in the tablelands and western slopes of NSW (DECCW, 2010).
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	NA
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction	(i) The proposal would directly impact on 2.46 ha of Box-Gum Woodland at eight places along the proposal site (KP 20.4, 33.2, 34, 53.1, 55.2, 57.5, 58.7 and 65.55). This is approximately 0.05% of the mapped Box-gum Woodland vegetation community within a 5 km buffer of the proposed pipeline, so removal of this small area would not be likely to significantly increase the risk of extinction for this community. (ii) Construction works may also indirectly impact on this community through altered stream hydrology, movement of sediments, nutrients and pollutants, disturbance of wildlife during construction and introduction and spread of riparian weeds. With appropriate mitigation as proposed within this report, the proposal would be unlikely to modify this community to the extent that the risk of extinction is significantly increased.
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become	(i) The proposal would directly impact on a maximum of 2.46 ha of Box-Gum Woodland. (ii) The proposal would not significantly further fragment eight patches of the community because the existing pipeline and other infrastructure already fragment the remnant communities and the proposal is a widening of the existing linear pipeline.

Box-Gum Woodland: Endangered	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	(iii) The Box-Gum Woodland present within the proposal site is of low quality due to grazing and cropping landuses. The native species diversity in the groundlayer is low and the abundance of non-native species is high. Many of the patches are within roadside verges or are small isolated patches within a cleared agricultural landscape. Several other areas of Box-Gum Woodland are known within the vicinity of the proposed pipeline. An estimate of remnant Box-Gum Woodland within the 5 km buffer surrounding the pipeline is 5,243 ha. The 2.46 ha community impacted by the proposed pipeline therefore represents 0.05% of the total area.
Will the action affect critical habitat?	No critical habitat has been declared by the Director-General for Box-Gum Woodland.
Will the action be consistent with any recovery or action plans?	The action proposed is not inconsistent with the 11 priority action statements identified to help the recovery of Box-Gum Woodland (DECCW, 2010).
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed in NSW, one is relevant to the proposal: 1) Clearing of native vegetation Clearing of vegetation would reduce the amount of Box-Gum Woodland from within the alignment.
Conclusion	The proposal would result in the clearance of 2.46 ha of Box-Gum Woodland. The condition of the Box-Gum Woodland to be removed is generally low due to low species diversity, high weed invasion and the effects of agricultural landuse. The loss of eight patches of the community would be unlikely to have a significant impact on this ecological community.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i> . Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx . Accessed March 2011.

Yass Daisy (*Ammobium craspedioides*): Vulnerable

Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	The Yass Daisy is listed as Vulnerable in part 3 of Schedule 1 of the NSW TSC Act. This species flowers in summer (DECCW, 2010). The Yass Daisy grows in moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities. This species generally grows in association with a large range of eucalypts (<i>Eucalyptus blakelyi</i>, <i>E. bridgesiana</i>, <i>E. dives</i>, <i>E. goniocalyx</i>, <i>E. macrorhyncha</i>, <i>E. mannifera</i>, <i>E. melliodora</i>, <i>E. polyanthemos</i> and <i>E.rRubida</i>) (DECCW, 2010).
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of this species (e.g. pollination and pollinators, seed dispersal and germination, local fire regimes, etc.). It may impact indirectly through the removal of habitat.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	(i) This species was not recorded within the proposed pipeline. Yass Daisy is found in moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities. Up to 2.46 ha of habitat suitable for the Yass Daisy would be removed or impacted in narrow 30 m wide strips, would be revegetated following construction. Estimates of dry forest communities within the 5 km buffer surrounding the pipeline are 5365.26 ha. The 2.46 ha potential impacted by the proposed pipeline therefore represents 0.04% of the total area. (ii) The area being clearing is highly modified and disturbed, and is already fragmented by the roads and agricultural clearings. (iii) It is unlikely that 2.46 ha of potential habitat for Yass Daisy removed in 30 m wide strips would have significant impact on the long term survival of the species.
Will the action affect critical habitat?	No critical habitat has been declared by the Director-General of the NPWS for Yass daisy.
Will the action be consistent with any recovery or action	There is no Recovery Plan for the Yass Daisy (DECCW, 2010). The proposal would not be inconsistent with the objectives of any relevant threat abatement

Yass Daisy (<i>Ammobium craspedioides</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
plans?	plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed in NSW, one is relevant to the proposal: 1) Clearing of native vegetation The proposal has some potential for contributing to point 1 through the proposed removal of approximately 2.46 ha of woodland vegetation. However, the linear nature and narrow corridor of this proposal would be unlikely to make a significant contribution.
Conclusion	The proposal would result in the removal of approximately 2.46 ha of potential habitat for the Yass Daisy. Nevertheless, the linear nature and narrow corridor of the proposal would be unlikely to have a significant impact on a local population of the species. Furthermore, the mitigation strategies in this report aim to avoid clearing of any remnant woodland and to revegetate the pipeline alignment with native species characteristics of the region.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i>. Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx. Accessed March 2011.

Silky Swainson-pea (<i>Swainsona sericea</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	Silky Swainson-pea is listed as Vulnerable in part 3 of Schedule 1 of the NSW TSC Act. Silky Swainson-pea is a prostrate or erect perennial, growing to 10 cm tall. This species flowers in spring, and has hairy pods. This species is found in Box-Gum Woodland in the Southern Tablelands and South West Slopes (DECCW, 2011).
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of this species (e.g. pollination and pollinators, seed dispersal and germination, local fire regimes, etc.). It may impact indirectly through the removal of habitat.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	(i) This species was not recorded within the proposed pipeline. Silky Swainson-pea grows in Box-Gum Woodland. Up to 2.46 ha of woodland provides potential habitat for silky Swainson-pea would be removed or impacted in narrow 30 m wide strips, would be revegetated following construction. (ii) The area being clearing is highly modified and disturbed, and is already fragmented by the roads and agricultural clearings. (iii) It is unlikely that the 2.46 ha of woodland of potential habitat for silky Swainson-pea removed in 30 m wide strips would have significant impact on the long term survival of the species.
Will the action affect critical habitat?	No critical habitat has been declared by the Director-General for Silky Swainson-pea.
Will the action be consistent with any recovery or action plans?	There is no Recovery Plan for the Silky Swainson-pea (DECCW, 2010). The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening	Of the 35 key threatening processes listed in NSW, one is relevant to the proposal:

Silky Swainson-pea (<i>Swainsona sericea</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
process for the species, population or ecological community.	1) Clearing of native vegetation The proposal has some potential for contributing to point 1 through the proposed removal of approximately 2.46 ha of woodland vegetation. However, the linear nature and narrow corridor of this proposal would be unlikely to make a significant contribution.
Conclusion	The proposal would result in the removal of approximately 2.46 ha of Box-Gum Woodland, which may provide potential habitat for the Silky Swainson-pea. Nevertheless, the linear nature and narrow corridor of the proposal would be unlikely to have a significant impact on a local population of the species. Furthermore, the mitigation strategies in this report aim to avoid clearing of any remnant woodland and to revegetate the pipeline alignment with native species characteristics of the region.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i>. Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx. Accessed March 2011.

Woodland Birds	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	The following 14 threatened woodland bird species were grouped together for the purposes of the TSC Act Section 5a Assessment (Seven Part Test) due to their similar lifecycle requirements: Regent Honeyeater (<i>Anthochaera phrygia</i>): Critically Endangered The range of the Regent Honeyeater has declined dramatically, with an extremely disjointed distribution and a total population believed to contain fewer than 1,500 individuals (NPWS, 1999). There are only three known key breeding regions remaining: northeast Victoria (Chiltern-Albury) and in NSW at Capertee Valley and the Bundarra-Barraba region (DECCW, 2010). In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. However, in some years non-breeding flocks converge on flowering coastal woodlands and forests (DECCW, 2010), including the Hunter Valley (Higgins et al., 2001). The Regent Honeyeater occurs in eucalypt woodlands and open forests. Most records of the species are from box-ironbark eucalypt forest and woodland, lowland coastal forests that are dominated by swamp mahogany (<i>Eucalyptus robusta</i>) and spotted gum (<i>Corymbia maculata</i>) and riparian forests of river she-oak (<i>Casuarina cunninghamia</i>) (DECCW, 2010). Nectar comprises the main diet, with 16 species of eucalypt and two species of mistletoe browsed. However, three species of eucalypt make up the predominant nectar sources: mugga ironbark (<i>Eucalyptus sideroxylon</i>), White Box (<i>E. albens</i>) and Yellow Box (<i>E. melliodora</i>) (Webster and Menkhorst, 1992; Higgins et al., 2001). Nests are frequently located in mugga ironbark and river red gum (<i>E. camaldulensis</i>), but may also be in other eucalypts, mistletoe clumps and Casuarina species (DECCW, 2010). <u>No Regent Honeyeaters were observed during the field survey, however habitat possibly suitable for this species was observed.</u> Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>): Vulnerable The Brown Treecreeper is widely distributed in eastern Australia. It occurs in eastern and central NSW including the Western Plains, the Great Dividing Range and tablelands. It is less commonly found on coastal plains and ranges. It inhabits dry and semi arid eucalypt woodlands (including box-gum woodland) and dry open forests. It prefers woodlands with rough-barked eucalypts and an open grassy understorey with or without shrubs. It is also found in mallee and river red gum (<i>Eucalyptus camaldulensis</i>) forest bordering wetlands. Fallen timber is an important habitat component for foraging. <u>No Brown Treecreepers were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Little Lorikeet (<i>Glossopsitta pusilla</i>): Vulnerable The Little Lorikeet is distributed widely in eastern Australia from Cape York to South Australia. NSW provides a large portion of the species' core habitat. In NSW it occurs in forests and woodlands from the coast to the Western Slopes of the Great Dividing Range. Nomadic movements are common, influenced by season and food availability, although some areas retain residents for much of the year and "locally nomadic" movements are suspected of breeding pairs (DECCW, 2010). It typically invades coastal districts to feed on winter flowering trees. The Little Lorikeet forages primarily in the canopy of open forest and woodland. It feeds on nectar from the blossoms of Eucalyptus, Corymbia,

Woodland Birds	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
	Angophora, Melaleuca and other tree species (DECCW, 2010). <u>No Little Lorikeets were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Painted Honeyeater (<i>Grantiella picta</i>): Vulnerable In NSW, the Painted Honeyeater occurs on the inland slopes of the Great Dividing Range (DECCW, 2010). It is nomadic and uncommon throughout their range. They inhabit open forest and woodlands where mistletoe occurs. Painted Honeyeater almost exclusively eats the nectar from mistletoe. Breeding occurs from October to March. Nests are constructed of grass and Casuarina needles bound together with cobwebs. <u>No Painted Honeyeaters were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Swift Parrot (<i>Lathamus discolor</i>): Endangered The Swift Parrot is migratory, breeding in Tasmania and migrating north in the autumn and winter months. In NSW, it occurs on the coast and southwest slopes (DECCW, 2010). The Swift Parrot is found in NSW foraging in forests of medium to large trees (Kennedy, 2000; Kennedy & Overs, 2001; Saunders, 2002) where eucalypts are flowering profusely or where there are abundant lerp infestations. Associated feed trees include winter flowering species such as swamp mahogany (<i>Eucalyptus robusta</i>), spotted gum (<i>Corymbia maculata</i>), red bloodwood (<i>C. gummifera</i>), mugga ironbark (<i>E. sideroxylon</i>), and White Box (<i>E. albens</i>). Commonly used lerp infested trees include inland grey box (<i>E. macrocarpa</i>), grey box (<i>E. moluccana</i>) and blackbutt (<i>E. Pilularis</i>) (DECCW, 2010). <u>No Swift Parrots were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Hooded Robin (south-eastern) (<i>Malanodryas cucullata cucullata</i>): Vulnerable The Hooded Robin is widespread in arid and semi-arid districts, but rarely occurs in coastal districts. It apparently is sedentary. The south-eastern form (subspecies <i>cucullata</i>) is found from Brisbane to Adelaide and throughout much of inland NSW. It prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee. It requires structurally diverse habitats featuring mature trees, saplings, shrubs and a grass layer. It also requires numerous stumps, fallen timber or low branches to perch and pounce on prey (DECCW, 2010). <u>No Hooded Robins were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Diamond Firetail (<i>Stagonopleura guttata</i>): Vulnerable The Diamond Firetail occurs in eastern Australia from central Queensland to South Australia. It is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina. It is found mostly in semi arid inland districts and rarely in coastal districts. It is found in grassy eucalypt woodlands, including box-gum woodlands, snow gum woodlands, open forest, mallee and grasslands. It often occurs in riparian areas and sometimes in lightly wooded farmland. The species appears to be sedentary

Woodland Birds	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
	(DECCW, 2010). <u>No Diamond Firetails were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Black-chinned Honeyeater (<i>Melithreptus gularis gularis</i>): Vulnerable In NSW the Black-chinned Honeyeater is distributed, from the Tablelands and western Slopes of the Great Divide to the north-western and central-western plains and the Riverina. It is rare on the NSW North Coast but is recorded regularly in the Richmond and Clarence Valleys. It mostly occupies the upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts. It also inhabits open forests of smooth-barked gums, stringybarks, ironbarks and tea-trees (DECCW, 2010). <u>No Black-chinned Honeyeaters were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Gilbert's whistler (<i>Pachycephala inornata</i>) Vulnerable Gilbert's Whistler is distributed throughout most of inland NSW. It occurs in mallee shrub lands, box-ironbark woodlands, cypress pine and belah woodlands and river red gum forests (DECCW, 2010). They forage near the ground in shrub thickets and in the tops of small trees. Their diet consists mainly of spiders, insects, seeds and fruit. Breeding takes place from August and November. Nests are built in dense shrubs. <u>No Gilbert's whistlers were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Grey-crowned babbler (eastern sub-species) (<i>Pomatostomus temporalis temporalis</i>): Vulnerable The Grey-crowned Babbler occurs from Cape York Queensland south to NSW and Victoria. In NSW it is found on the western slopes of the Great Dividing Range, in the Hunter Valley and on the North Coast. It inhabits a variety of drier woodlands, particularly box-gum woodlands, box-cypress pine and open box woodlands on alluvial plains (DECCW, 2010). <u>No Grey-crowned Babblers were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Flame Robin (<i>Petroica phoenicea</i>) Vulnerable The Flame Robin is distributed from near the Queensland border to south-eastern South Australia (DECCW, 2010). In NSW it breeds in upland areas and moves onto the plains during winter. This species inhabits tall moist eucalypt forests and woodlands with clear or open understoreys. The species has also been recorded in dry forests, open woodlands, pastures and native grasslands. Flame Robin forages on the ground where it swoops from logs and low perches to pounce on insects. It breeds spring to late summer. Nests are constructed near the ground in cavities in trees or stumps (DECCW, 2010). <u>No Flame Robins were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Turquoise Parrot (<i>Neophema pulchella</i>): Vulnerable The distribution of Turquoise Parrot extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. It lives on the edges of eucalypt woodland adjoining clearings,

Woodland Birds	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
	timbered ridges and creeks in farmland, where it is usually seen in pairs or small flocks. It prefers to feed in the shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants, or browsing on vegetable matter. It forages quietly and may be quite tolerant of disturbance. However, if flushed it will fly to a nearby tree and then return to the ground to browse as soon as the danger has passed. Turquoise Parrot nests in tree hollows, logs or posts, from August to December. <u>No Turquoise Parrots were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Superb Parrot (<i>Polytelis swainsonii</i>): Vulnerable The Superb Parrot is distributed throughout eastern inland NSW. It is migratory and breeds between Cowra, Yass, Grenfell, Cootamundra and Coolac. After breeding the species moves north to the Namoi and Gyndir Rivers. It inhabits box-gum, box-cypress and boree woodlands and river red gum forest. The diet consists mainly of grass seeds, herbaceous plants, fruits, berries, nectar and grain. It feed in trees as well as on the ground (DECCW, 2010). <u>No Superb Parrots were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Speckled Warbler (<i>Pyrholaemus saggitatus</i>): Vulnerable The Speckled Warbler has a patchy distribution throughout south-eastern Queensland, the eastern half of NSW and into Victoria, as far west as the Grampians. The species is most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast. There has been a decline in population density throughout its range, with the decline exceeding 40% where no vegetation remnants larger than 100 ha survive. It inhabits a range of eucalypt forests and woodlands with a dense shrub layer and a grassy understorey, often on rocky ridges or in gullies (DECCW, 2010). <u>No Speckled Warblers were observed during the field survey. However habitat possibly suitable for this species was observed.</u>
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of these species (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of possible habitat.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that	NA

Woodland Birds	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
it could be at risk of extinction.	
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	Suitable habitat for the 14 woodland bird species was identified within the proposal site in the form of disjunct patches of remnant native vegetation. The proposal involves the construction of a 70 km long pipeline located in an existing 20 m wide easement. Although the majority of the proposal site is cleared (approximately 96.7% of the route), 2.46 ha of woodland would be removed or modified. Small isolated patches of disturbed eucalypt woodland are transacted by the proposed pipeline along approximately 2.3 km of its length. Due to the small amount of habitat required to be cleared in the narrow construction corridor, the already fragmented nature of the remnant vegetation (by agricultural land use and roads), and the linear nature of the proposal, the remaining habitat is not likely to become further fragmented or isolated from areas of continuous vegetation. It is not likely that the habitat that will be removed is important to the long term survival of these woodland bird species because the proposal site is highly fragmented and disturbed by agricultural land use, the species are highly mobile, and there are continuous vegetation remnants with higher quality habitat features elsewhere in the landscape.
Will the action affect critical habitat?	No critical habitat has been declared for these species.
Will the action be consistent with any recovery or action plans?	There are no Recovery Plans for these species (DECCW, 2010). The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and these species: 1) clearance of native vegetation; 2) loss of hollow bearing trees; 3) removal of dead wood and fallen trees. The proposal has potential for contributing to these key threatening processes through the proposed removal of a maximum of 2.46 ha of woodland vegetation, hollow-bearing trees and some fallen trees along the pipeline route. The linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution to these key threatening processes.
Conclusion	The proposal would involve the disturbance of 2.46 ha of marginal foraging habitat and possibly breeding habitat for 14 threatened woodland bird species. Nevertheless, the small scale of the proposed project would be unlikely to have a significant impact on a local population of the species. Within the vicinity of the proposal site there exist large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i>. Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx. Accessed November 2010. Higgins, P.J., Steel, W.K. and Peter, J.M., eds (2001). <i>Handbook of Australian, New Zealand and Antarctic Birds, vol. 5, Tyrant-flycatchers to Chats</i>. Oxford University Press, Melbourne.

Woodland Birds	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
	NPWS (1999). <i>Threatened Species Information Sheet: Regent Honeyeater</i>. NSW National Parks and Wildlife Service, Hurstville, NSW. Webster, R. and Menkhorst, P. (1992). <i>The Regent Honeyeater (Xanthomyza phrygia): Population status and ecology in Victoria and New South Wales</i>. Arthur Rylah Institute for Environmental Research Technical Report No. 126. Victorian Department of Conservation and Natural Resources, Melbourne.

Bush Stone-curlew (<i>Burhinus grallarius</i>): Endangered	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. In the south-east, it is either rare or extinct throughout their former range. It inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber. It is largely nocturnal, being especially active on moonlit nights. The main diet consists of insects and small vertebrates, such as frogs, lizards and snakes. The species nests on the ground in a scrape or small bare patch, during spring and early summer. The main threats to the Bush Stone-curlew include: • predation by foxes and cats • trampling of eggs by cattle • clearance of woodland habitat for agricultural and residential development • modification and destruction of ground habitat through removal of litter and fallen timber, introduction of exotic pasture grasses grazing and frequent fires • disturbance in the vicinity of nest sites. No Bush Stone-curlews were observed during the field survey. However habitat possibly suitable for this species was observed.
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of this species (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of habitat and dead and fallen timber.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and	Suitable habitat for the Bush Stone-curlew was identified within the proposal site in the form of remnant native vegetation. Approximately 2.3 km of the pipeline route is vegetated with suitable woodland for this species. Approximately 2.46 ha of potential habitat would be removed or modified by the proposal. The habitat would provide limited foraging and nesting opportunities for the species. Other suitable habitat would remain adjacent to the corridor. The proposal would likely result in minor losses of connectivity in linear remnant vegetation located adjacent to roadways and rivers along the proposal site.

Bush Stone-curlew (<i>Burhinus grallarius</i>): Endangered	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	However due to the relatively small width of the corridor, the current level of fragmentation in the surrounding area and the already disturbed nature of the proposal site, it is unlikely the proposed corridor would have a significant impact the habitat for the Bush Stone-curlew. The proposal would result in a 30 m wide clearing, in already disturbed environments. It is unlikely that the habitat to be removed for the proposed corridor is important to the long-term survival of the species as areas of suitable habitat would remain for the species outside the corridor.
Will the action affect critical habitat?	There is no listed critical habitat for this species.
Will the action be consistent with any recovery or action plans?	There are no recovery plans for the Bush Stone-curlew. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) clearance of native vegetation. 2) removal of dead wood and fallen trees. The proposal has some potential for contributing to point 1 through the proposed removal of a maximum of 6.96 ha of woodland vegetation. The linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution to this key threatening process. The proposal has some potential for contributing to point 2 through the removal of dead and fallen timber within the corridor. However, provided that the removed timber and logs are placed in adjacent habitat or reinstated back along the corridor following construction than the proposal would be unlikely to make a significant contribution.
Conclusions	The proposal would involve the disturbance of marginal foraging and breeding habitat for the Bush Stone-curlew. This disturbance will be minimal due to the linear nature of the proposal and small amount of removal of this vegetation required. Within the vicinity of the proposal site there exists large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat such the proposal would be unlikely to have a significant impact on any local populations.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i>. Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx. Accessed November 2010.

Gang-gang Cockatoo (<i>Callocephalon fimbriatum</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	Gang-gang Cockatoo is distributed from southern Victoria through to central eastern NSW (DECCW, 2010). In NSW, the Gang-gang Cockatoo is distributed from the southeast coast to the Hunter region, and inland to the Central Tablelands and South West slopes (DECCW, 2010). It occurs regularly in the ACT, but is rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee (DECCW, 2010). It is found in tall mountain forest and woodlands, especially mature wet sclerophyll forests in summer. In winter, it moves to lower altitudes where it occupies drier, more open eucalypt forests and woodlands (particularly box-ironbark assemblages or dry coastal forest) and urban areas (DECCW, 2010). The Gang-gang Cockatoo favours vegetation with old growth elements for nesting and roosting. Birds nest in large hollows in the trunk or limbs of living or dead eucalypt trees (Gibbons and Lindenmayer, 2002). No Gang-gang Cockatoos were observed during the field survey. However habitat possibly suitable for this species was observed.
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of this species (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of habitat.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or	Suitable habitat for the Gang-gang Cockatoo was identified within the proposal site in the form of remnant native vegetation. The proposal would result in the removal of 2.46 ha of woodland consisting of suitable habitat for the Gang-gang Cockatoo. Due to the small amount of habitat required to be cleared in the narrow construction corridor, the already fragmented nature of the remnant vegetation (by agricultural land use and roads), and the linear nature of the proposal, the remaining habitat is not likely to become further fragmented or isolated from areas of continuous vegetation. The proposal would likely result in minor losses of connectivity in linear remnant vegetation located adjacent to roadways and rivers along the proposal site. However due to the relatively small width of the corridor, the current level of

Gang-gang Cockatoo (<i>Callocephalon fimbriatum</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
ecological community in the locality.	fragmentation in the surrounding area and the already disturbed nature of the proposal site, it is unlikely that the proposed corridor would have a significant impact on the habitat of the Gang-gang Cockatoo. The proposal would result in a 30 m wide clearing, in already disturbed environments. It would result in the removal of some foraging habitat and some hollow-bearing trees.
Will the action affect critical habitat?	There is no listed critical habitat for this species.
Will the action be consistent with any recovery or action plans?	There are no recovery plans for the Gang-gang Cockatoo. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) clearance of native vegetation. 2) loss of hollow-bearing trees. The proposal has some potential for contributing to point 1 through the proposed removal of a maximum of 2.46 ha of woodland vegetation. The linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution to this key threatening process. The proposal will remove hollow-bearing trees which could contribute to point 2. Provided that any removed hollows are recycled and attached to adjacent trees, then the proposal is unlikely to make a significant contribution to this threatening process.
Conclusions	The proposal would result in the removal of approximately 2.46 ha of habitat suitable for the Gang-gang Cockatoo. Nevertheless, the small scale of the proposed project would be unlikely to have a significant impact on a local population of the species.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i> . Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx . Accessed November 2010. Gibbons P. and Lindenmayer D.B (2002) <i>Tree Hollows and Wildlife Conservation in Australia</i> . CSIRO Publishing, Melbourne.

Glossy Black-cockatoo (<i>Calyptorhynchus lathamii</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	Glossy Black-cockatoo occurs in a wide coastal band from central Queensland to the Victorian border, with an isolated population occurring in South Australia on Kangaroo Island (NPWS, 1999). In NSW, the species' distribution is patchy and localised, reflecting the distribution of its moist and dry sclerophyll forest habitat. This species is locally nomadic (NPWS, 1999). The Glossy Black-cockatoo is found in open forests and woodlands which contain stands of she-oak species (DECCW 2010) but also occurs in bushland remnants in agricultural and urban areas (Higgins, 1999). However, the species appears to occur in peak abundance in old growth forest. In particular, they feed almost exclusively on the seeds of forest she-oak (<i>Allocasuarina torulosa</i>), drooping she-oak (<i>A. verticillata</i>) and black she-oak (<i>A. littoralis</i>), although occasionally it also eats the seeds of other she-oak species. In eastern NSW, black she-oak is the main dietary component (Chapman, 1999). No Glossy Black-cockatoos were observed during the field survey. However habitat possibly suitable for this species was observed.
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of this species (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of habitat and hollow-bearing trees.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or	Suitable habitat for the Glossy Black-cockatoo was identified within the proposal site in the form of remnant native vegetation. The proposal would result in the removal of approximately 2.46 ha of woodland which is marginally suitable for the Glossy Black-cockatoo. No feed trees for this species were recorded in the proposal site and therefore no foraging habitat for the species would be removed. The species is likely to fly over the proposal site on occasion. It is not likely that the proposal would further fragment habitat for the species as more suitable habitat exists in adjacent remnant woodland patches. The trees to be removed do not include feed tree species. However, hollow-bearing trees will be removed along the pipeline route. It is not likely that these habitat features are important to the survival of the Glossy Black-cockatoo, as there are more suitable breeding areas for this species adjacent to the proposal

Glossy Black-cockatoo (<i>Calyptorhynchus lathamī</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
ecological community in the locality.	site.
Will the action affect critical habitat?	There is no listed critical habitat for this species.
Will the action be consistent with any recovery or action plans?	There are no recovery plans for the Glossy Black-cockatoo. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) clearance of native vegetation. 2) loss of hollow-bearing trees. The proposal has some potential for contributing to point 1 through the proposed removal of a maximum of 6.96 ha of woodland vegetation. The linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution to this key threatening process. The proposal has the potential to remove hollow-bearing trees which could contribute to point 2. Provided that any removed hollows are recycled and attached to adjacent trees, then the proposal is unlikely to make a significant contribution to this threatening process.
Conclusions	The proposal would involve the disturbance of marginal foraging and possibly breeding habitat for the Glossy Black-cockatoo. Within the vicinity of the proposal site there exists large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat such the proposal would be unlikely to have a significant impact on any local populations.
References	Chapman, T. (1999) Fussy Black-cockatoos. <i>Nature Australia</i> , Summer 1999-2000, pp 48 -55. DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i> . http://www.threatenedspecies.environment.nsw.gov.au/index.aspx . Accessed November 2010. Higgins, P.J. (1999) <i>The Handbook of Australian, New Zealand and Antarctic Birds. Volume 4 Parrots to Dollarbird</i> . Oxford University Press, Melbourne. NPWS. (1999) <i>Threatened Species Information Sheet: Glossy Black-Cockatoo</i> . NSW National Parks and Wildlife Service, Hurstville, NSW.

Spotted Harrier (<i>Circus assimilis</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	The Spotted Harrier is distributed throughout NSW except in dense forest or wooded habitats on the coast or in the escarpments and ranges. The species inhabits grassy open woodlands, inland riparian woodlands, grasslands and shrub lands. It is often found over native grasslands but can also inhabit agricultural grazing land (DECCW, 2010). The Spotted Harrier diet consists of terrestrial mammals, birds, reptiles, insects and carrion. Breeding begins spring and the eggs are laid in stick nests in trees (DECCW, 2010). No Spotted Harriers were observed during the field survey. However habitat possibly suitable for this species was observed.
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of this species (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of habitat.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	If the entire pipeline route is considered potentially suitable hunting habitat for this species, then up to 210 ha of habitat would be temporarily removed or modified by the proposal. The habitat consists of small patches of disturbed eucalypt woodlands, open grassy areas and cropped lands. The habitat would provide foraging and nesting opportunities for the species. The construction will temporarily remove grassy groundcover from the proposal site. Once rehabilitated, the grass will return and foraging habitat for the Spotted Harrier would be reinstated. The proposal will not fragment habitat suitable for this species. It is wide-ranging and the area of habitat to be modified is small compared to a home range. The subject area is likely to be unimportant to the long term survival of the species. If the species is utilising the proposal site as part of its home range, the site will be reinstated after construction and return to suitable habitat quickly.
Will the action affect critical habitat?	There is no listed critical habitat for this species.
Will the action be consistent	There are no recovery plans for the spotted harrier.

Spotted Harrier (<i>Circus assimilis</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
with any recovery or action plans?	The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) clearance of native vegetation. The proposal has some potential for contributing to point 1 through the proposed removal of approximately 210 ha of woodland vegetation and grasslands, which could provide habitat for the Spotted Harrier. However, the linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution.
Conclusion	The proposal would involve the disturbance of foraging and possibly breeding habitat for the Spotted Harrier. This disturbance will be minimal due to the temporary nature of the disturbance and small amount of removal of vegetation required. The proposed project is unlikely to have a significant impact on a local population of the species.
References	DECCW (2010) <i>Threatened species, populations and ecological communities of NSW</i>. Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx. Accessed November 2010.

Square-tailed Kite (*Lophoictinia isura*): Vulnerable

Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	The Square-tailed Kite ranges over most of Australia. It inhabits open eucalypt forests and woodlands and prefers timbered watercourses. It forages on small birds, insects and reptiles above the tree tops and rarely take prey from the ground (DECCW, 2010). No Square-tailed Kites were observed during the field survey. However habitat possibly suitable for this species was observed.
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of the Square-tailed Kite (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of habitat.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	If the entire pipeline route is considered potentially suitable hunting habitat for this species, then up to 210 ha of habitat would be temporarily removed or modified by the proposal. The habitat consists of small patches of disturbed eucalypt woodlands, open grassy areas and cropped lands. The habitat would provide foraging and nesting opportunities for the species. The construction will temporarily remove grassy groundcover from the proposal site. Once rehabilitated, the grass will return and foraging habitat for the Square-tailed Kite would be reinstated. The proposal will not fragment habitat suitable for this species. It is wide-ranging and the area of habitat to be modified is small compared to a home range. The subject area is likely to be unimportant to the long term survival of the species. If the species is utilising the proposal site as part of its home range, the site will be reinstated after construction and return to suitable habitat quickly
Will the action affect critical habitat?	There is no listed critical habitat for this species.
Will the action be consistent with any recovery or action plans?	There are no recovery plans for the Square-tailed Kite. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or	Of the 35 key threatening processes listed for NSW by DECCW (2010), the

Square-tailed Kite (<i>Lophoictinia isura</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
is part of a key threatening process for the species, population or ecological community.	following are relevant to the location, the proposal and the species: 1) clearance of native vegetation. The proposal has some potential for contributing to point 1 through the proposed removal of a maximum of 6.96 ha of woodland vegetation. The linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution to this key threatening process.
Conclusion	The proposal would involve the disturbance of marginal foraging and possibly breeding habitat for the Square-tailed Kite. This disturbance will be minimal due to the temporary nature of the disturbance and small amount of removal of vegetation required. The proposed project is unlikely to have a significant impact on a local population of the species.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i> . Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx . Accessed November 2010.

Barking Owl (<i>Ninox connivens</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	The Barking Owl occurs throughout Australia except for the central arid regions and Tasmania. It is quite common in parts of northern Australia, but is generally considered uncommon in southern Australia. It has declined across much of its distribution in NSW and now occurs only sparsely. It is most frequently recorded on the western slopes and plains. It is rarely recorded in the far west or in coastal and escarpment forests (DECCW, 2010). The Barking Owl usually inhabits eucalypt woodland, partly cleared farmland, open forest, swamp woodlands and, especially in inland areas, timber along watercourses. Dense vegetation is used occasionally for roosting. During the day it roosts along creek lines, usually in tall understorey trees with dense foliage such as <i>Acacia</i> and <i>Casuarina</i> species, or the dense clumps of canopy leaves in large Eucalypts. Territories range from 30 to 200 ha and birds are present all year (DECCW, 2010). No Barking Owls were observed during the field survey. However habitat possibly suitable for this species was observed.
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of the Barking Owl (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of habitat and the loss of a small number of hollow-bearing trees.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	Suitable habitat for the Barking Owl was identified within the proposal site in the form of remnant native vegetation. Approximately 2.46 ha of woodland would be removed or modified by the proposal. Small patches of disturbed eucalypt woodlands with limited connectivity are transacted by the proposal totalling approximately 2.3 km of previously disturbed remnant native vegetation. Due to the limited amount required to be cleared in the narrow construction corridor, the already fragmented nature, and the linear nature of the proposal, impact on remnant vegetation and suitable habitat for the Barking Owl would be minimal. The proposal would result in a 30 m wide clearing, in already disturbed environments. The proposal would result in the removal of foraging habitat and a small number of hollow-bearing trees. It is unlikely that the habitat to be removed for the proposed corridor is important to the long-term survival of the species as areas of suitable habitat would remain for the species outside the corridor.
Will the action affect critical	There is no listed critical habitat for this species.

Barking Owl (<i>Ninox connivens</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
habitat?	
Will the action be consistent with any recovery or action plans?	There are no recovery plans for the Barking Owl. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) clearance of native vegetation. 2) loss of hollow-bearing trees. The proposal has some potential for contributing to point 1 through the proposed removal of a maximum of 6.96 ha of woodland vegetation. The linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution to this key threatening process. The proposal has the potential to remove hollow-bearing trees which could contribute to point 2. Provided that any removed hollows are recycled and attached to adjacent trees, then the proposal is unlikely to make a significant contribution to this threatening process.
Conclusion	The proposal would involve the disturbance of marginal foraging possibly breeding habitat for the Barking Owl. This disturbance will be minimal due to the linear nature of the proposal and minimal amount of removal of this vegetation required. Within the vicinity of the proposal site there exists large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat such the proposal would be unlikely to have a significant impact on any local populations.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i> . Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx . Accessed November 2010.

Eastern pygmy-possum (<i>Cercartetus nanus</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	The Eastern Pygmy-possum is found in south-eastern Australia, from southern Queensland to eastern South Australia and in Tasmania (DECCW, 2010). In NSW, it ranges from the coast to inland as far as Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes (DECCW, 2010). It is found mainly in woodlands and heath, but can also occupy rainforest and sclerophyll forest (DECCW, 2010). It shelter during the day in small tree hollows, holes in the ground, spherical nests under the bark of eucalypts, empty birds' nests, ringtail possum (<i>Pseudocheirus peregrinus</i>) dreys or thickets of vegetation (DECCW, 2010). These habitat requirements mean that suitable shelter sites are located in the same plant communities as the possums' food trees (Turner and Ward, 1995; Bowen and Goldingay, 2000). No Eastern Pygmy-possums were observed during the field survey. However habitat possibly suitable for this species was observed.
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of the Eastern Pygmy-possum (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of habitat and the loss of a small number of hollow-bearing trees.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	Suitable habitat for the Eastern Pygmy-possum was identified within the proposal site in the form of remnant native vegetation. Approximately 2.46 ha of woodland vegetation would be removed or modified by the proposed project. Small patches of disturbed eucalypt woodlands with limited connectivity are transacted by the proposal totalling approximately 2.3 km of previously disturbed remnant native vegetation. Due to the limited amount required to be cleared in the narrow construction corridor, the already fragmented nature, and the linear nature of the proposal, impact on remnant vegetation and suitable habitat for the Eastern Pygmy-possum would be minimal. The proposal would result in a 30 m wide clearing, in already disturbed environments. The proposal would result in the removal of foraging habitat and a small number of hollow-bearing trees. It is unlikely that the habitat to be removed for the proposed corridor is important to the long-term survival of the species as areas of suitable habitat would remain for the species outside the corridor.
Will the action affect critical	There is no listed critical habitat for this species.

Eastern pygmy-possum (<i>Cercartetus nanus</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
habitat?	
Will the action be consistent with any recovery or action plans?	There are no recovery plans for the Eastern Pygmy-possum. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) clearance of native vegetation. 2) loss of hollow-bearing trees. The proposal has some potential for contributing to point 1 through the proposed removal of a maximum of 6.96 ha of woodland vegetation. The linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution to this key threatening process. The proposal has the potential to remove hollow-bearing trees which could contribute to point 2. Provided that any removed hollows are recycled and attached to adjacent trees, then the proposal is unlikely to make a significant contribution to this threatening process.
Conclusion	The proposal would involve the disturbance of marginal foraging and possibly breeding habitat for the Eastern Pygmy-possum. This disturbance will be minimal due to the linear nature of the proposal and minimal amount of removal of this vegetation required. Within the vicinity of the proposal site there exists large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat such the proposal would be unlikely to have a significant impact on any local populations.
References	Bowen M. and Goldingay R (2000) Distribution and Status of the Eastern Pygmy Possum (<i>Cercartetus nanus</i>) in New South Wales. <i>Australian Mammalogy</i>, 21: 153-164. DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i>. Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx. Accessed November 2010. Turner V. and Ward S (1995) 'Eastern Pygmy Possum <i>Cercartetus nanus</i>', pp. 217-218 in R. Strahan (ed.). <i>The Mammals of Australia</i>. Reed Books, Sydney.

Microchiropteran Bat (Microbats)	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	The following Microchiropteran Bat (Microbats) species were grouped together for the purposes of the TSC Act Section 5a Assessment (Seven Part Test) due to their similar lifecycle requirements: Eastern Bent-wing Bat (<i>Miniopterus schreibersii oceanensis</i>): Vulnerable The Eastern Bent-wing Bat occurs along the east and north-west coasts of Australia. It roosts in caves primarily but also in derelict mines, storm-water tunnels, buildings, and other man-made structures. Large maternity colonies are formed in caves in spring and summer. At other times of the year, populations disperse within about 300 km range of the maternity caves. Cold caves are used for hibernation in southern Australia. It hunts in forested areas, catching moths and other flying insects above the tree (DECCW, 2010). <u>No Eastern Bent-wing Bats were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Little Pied Bat (<i>Chalinolobus picatus</i>): Vulnerable The Little Pied Bat is found throughout semi-arid central-southern Queensland and western NSW. This species is found in a variety of habitats including mallee forest, mixed open forest, Araucarian notophyll vine forests, Callitris / Allocasuarina forests and dry sclerophyll forest dominated by, <i>Eucalyptus moluccana</i>, <i>E. tereticornis</i> and ironbark species (DSEWPC, 2009). It hunts in vegetated habitats and are unlikely to venture often into open habitats. The species roosts in caves, trees, abandoned mines, buildings and occasionally in abandoned houses and sheds. Hollow trees are often used for roosting and the species has a preference for large mature trees with hollows. <u>No Little Pied Bats were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Large-footed Myotis (<i>Myotis macropus</i>): Vulnerable The Large-footed Myotis roosts in small groups close to water in caves, mine shafts, hollow-bearing trees, culverts, buildings, under bridges and in dense foliage. This species is known from sea level to 840 m, from Victoria to south-east Queensland. It forages over streams and pools and is frequently associated with coastal floodplain wetlands (DECCW, 2010). <u>No Large-footed Myotis were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Greater Long-eared Bat (<i>Nyctophilus corbeni</i>): Vulnerable The Greater Long-eared Bat occurs mainly in the Brigalow Belt South Bioregion from the Expedition Range to the NSW border. The species is usually found in Buloke woodland, brigalow, open forest and mallee forest. (DSEWPC, 2010). It rarely travels more than 1 km from roosting sites while foraging (DSEWPC, 2010). Greater Long-eared Bat roosts solitarily under exfoliated bark and in crevices in trees (DSEWPC, 2010). <u>No greater long-eared bats were observed during the field survey. However habitat possibly suitable for this species was observed.</u> Yellow-bellied Sheath-tail Bat (<i>Saccolaimus flaviventris</i>): Vulnerable The Yellow-bellied Sheath-tail Bat occurs across northern and eastern Australia. Although primarily a tropical species its distributions extends well into south-eastern Australia. The Yellow-bellied Sheath-tail Bat is found in a variety

Microchiropteran Bat (Microbats)	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
	of habitats from wet and dry sclerophyll forests to open woodland, acacia scrubland, mallee, grasslands and deserts. It forages in most habitats across its very wide range, with and without trees. It roosts singly or in groups of up to six, in tree hollows and buildings, and will also roost in burrows in treeless areas. (DECCW, 2010). <u>No Yellow-bellied Sheath-tail Bats were observed during the field survey. However habitat possibly suitable for this species was observed.</u>
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of these Microbat species (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of habitat and the loss of a small number of hollow-bearing trees.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	Suitable habitat for the above Microbat species was identified within the proposal site in the form of remnant native vegetation. Approximately 2.46 ha of suitable habitat would be removed by the proposal, comprising hollow-bearing trees and grassy woodland. Small, isolated patches of disturbed eucalypt woodland will be modified by the proposal totalling approximately 2.3 km of the pipeline route. Due to the limited amount required to be cleared in the narrow construction corridor, the already fragmented nature, and the linear nature of the proposal, impact on remnant vegetation and suitable habitat for the above Microbat species would be minimal. It is unlikely that the woodland areas to be removed are important to the microbat species because less disturbed and fragmented woodland exists outside the proposal site.
Will the action affect critical habitat?	There is no listed critical habitat for these species.
Will the action be consistent with any recovery or action plans?	There are no recovery plans for the above Microbat species. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) clearance of native vegetation; 2) loss of hollow-bearing trees. The proposal has some potential for contributing to point 1 through the

Microchiropteran Bat (Microbats)	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
	proposed removal of a maximum of 6.96 ha of woodland vegetation. The linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution to this key threatening process. The proposal has the potential to remove hollow-bearing trees which could contribute to point 2. Provided that any removed hollows are recycled and attached to adjacent trees, then the proposal is unlikely to make a significant contribution to this threatening process.
Conclusion	The proposal would involve the disturbance of marginal foraging and possibly breeding habitat for the above Microbat species. This disturbance will be minimal due to the linear nature of the proposal and minimal amount of removal of this vegetation required. Within the vicinity of the proposal site there exists large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat and would be unlikely to have a significant impact on any local populations.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i>. Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx. Accessed November 2010. DSEWPC (2010). <i>Species Profile and Threats Database</i>. Available at: http://www.environment.gov.au/sprat. Accessed November 2010.

Spotted-tailed quoll (<i>Dasyurus maculatus</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	The Spotted-tailed Quoll occurs along the east coast of Australia from north-eastern Queensland through NSW and Victoria to Tasmania, with a disjunct distribution. The Spotted-tailed Quoll occurs in a range of environments, including sclerophyll forest and woodlands, coastal heathlands and rainforests (Dickman and Read, 1992; Edgar and Belcher, 1995; DECCW, 2010). Occasional records come from open country, grazing lands, rocky outcrops and other treeless areas. Although mainly terrestrial, the Spotted-tailed Quoll is an agile climber and may raid possum and glider dens and prey on roosting and fledgling birds. Nesting occurs in rock shelters, hollow logs, caves or tree hollows and individuals may use numerous dens within their home range. Estimates of home range size vary from 800 ha to 20 km² and individuals may move several kilometres in a night (Edgar and Belcher, 1995). No Spotted-tailed Quolls were observed during the field survey. However habitat possibly suitable for this species was observed.
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of this species (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of habitat and the loss of hollow-bearing trees.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	Suitable habitat for the Spotted-tailed Quoll would be removed by the proposal. Approximately 2.46 ha of woodland and several hollow-bearing trees would be removed from the proposal site. The home range of the species is large and therefore the proposed development will not likely result in fragmentation of potential habitat. There are no rock outcrops, caves streams or water sources in the site which would provide preferred habitat for this species. Only a small number of hollow-bearing trees would likely to be removed by the clearing so it is unlikely that the proposal would result in a significant loss of breeding sites. It is unlikely that the habitat to be removed for the proposed corridor is important to the long-term survival of the species as areas of suitable habitat would remain for the species outside the corridor.
Will the action affect critical habitat?	There is no listed critical habitat for this species.

Spotted-tailed quoll (<i>Dasyurus maculatus</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Will the action be consistent with any recovery or action plans?	There are no recovery plans for the spotted-tailed quoll. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) clearance of native vegetation. 2) loss of hollow-bearing trees The proposal has some potential for contributing to point 1 through the proposed removal of a maximum of 6.96 ha of woodland vegetation. The linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution to this key threatening process. The proposal has the potential to remove hollow-bearing trees which could contribute to point 2. Provided that the removed hollows are replaced with or the hollows are recycled, then the proposal is unlikely to make a significant contribution to this threatening process.
Conclusion	The proposal would involve the disturbance of marginal foraging and possibly breeding habitat for the Spotted-tailed Quoll. This disturbance will be minimal due to the linear nature of the proposal and minimal amount of removal of this vegetation required. Within the vicinity of the proposal site there exists large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat such the proposal would be unlikely to have a significant impact on any local populations.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i> . Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx . Accessed November 2010. Dickman, C.R. and Read, D.G. (1992). „The biology and management of Dasyurids in the arid zone in NSW“. <i>Species Management Report Number 11</i> . NSW National Parks and Wildlife Service, Hurstville, NSW. Edgar, R. and Belcher, C. (1995). „The Spotted-tailed Quoll <i>Dasyurus maculatus</i> “, pp. 67-68 in R. Strahan (ed.). <i>The Mammals of Australia</i> . Reed Books, Sydney. Scotts, D. (1992). <i>A preliminary survey for the Eastern Quoll, Dasyurus viverrinus, and other rare or endangered vertebrates, in Carrai State Forest, NSW</i> . Unpublished report to NSW National Parks and Wildlife Service.

Gliders (<i>Petaurus</i> sp.)	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	An assessment of potential habitat suggests that two threatened Glider species may have potential habitat occurring within the proposal site. These two species were assessed together for the purposes of the TSC Act Section 5a Assessment (Seven Part Test) due to their similar lifecycle requirements: Squirrel Glider (<i>Petaurus norfolcensis</i>): Vulnerable The Squirrel Glider is widely but sparsely distributed in eastern Australia, from northern Queensland to western Victoria (DECCW, 2010). It inhabits dry sclerophyll forests and woodlands and coastal banksia heathlands. This includes mature or old growth blackbutt-bloodwood forest with heathy understorey. It requires abundant hollow-bearing trees, a mix of eucalypts, acacias and banksias, at least one winter flowering species, and usually one or more smooth-barked eucalypts. It prefers a mixed species shrub or <i>Acacia</i> understorey. Its diet consists of <i>Acacia</i> gum, eucalypt sap, nectar, honeydew and manna (DECCW, 2010). Yellow-bellied Glider (<i>Petaurus australis</i>): Vulnerable The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. The species occurs in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. The species dens within hollows of large trees and is very mobile occupying large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food resources. A glider of the genus <i>Petaurus</i> was observed along the proposed corridor, but a positive identification was not made.
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of the species (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of habitat and the loss of a small number of hollow-bearing trees.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	The NSW threatened species search identified one endangered population of fauna species, <i>Squirrel glider in the Wagga Wagga Local Government Area</i>, listed under the TSC Act. This population occurs in an adjacent region to the proposal site approximately 60 km to the south west of the proposal. The species in this endangered population has preferred habitat which occurs within the proposal site in the form of modified stands of River Red Gum, Yellow Box and Grey Box which may be used for denning and foraging. However, due to the distance from the proposal to the endangered population, it is not expected that the proposal would have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction.
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA

Gliders (<i>Petaurus</i> sp.)	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	Suitable habitat for the Squirrel Glider was identified within the proposal site in the form of remnant native vegetation. Approximately 2.46 ha of suitable habitat for gliders would be removed or modified by the proposal. The linear nature of the proposal site within an already fragmented and disturbed landscape is not likely to result in fragmentation of habitat for these species. The habitat to be removed is potential foraging and nesting habitat for these species. Only a small number of hollow-bearing trees are likely to be removed by the clearing so it is unlikely that the proposal would result in a significant loss of breeding sites. It is unlikely that the habitat to be removed for the proposed corridor is important to the long-term survival of the species as areas of suitable habitat would remain for the species outside the proposal site.
Will the action affect critical habitat?	There is no listed critical habitat for this species.
Will the action be consistent with any recovery or action plans?	There are no recovery plans for either the Squirrel Glider or the Yellow-bellied Glider. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) clearance of native vegetation. 2) loss of hollow-bearing trees The proposal has some potential for contributing to point 1 through the proposed removal of a maximum of 6.96 ha of woodland vegetation. The linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution to this key threatening process. The proposal has the potential to remove hollow-bearing trees which could contribute to point 2. Provided that any removed hollows are recycled and attached to adjacent trees, then the proposal is unlikely to make a significant contribution to this threatening process.
Conclusion	The proposal would involve the disturbance of marginal foraging and possibly breeding habitat for the gliders. This disturbance will be minimal due to the linear nature of the proposal and minimal amount of removal of this vegetation required. Within the vicinity of the proposal site there exists large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat such the proposal would be unlikely to have a significant impact on any local populations.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i> . Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx . Accessed November 2010.

Brush-tailed Phascogale (<i>Phascogale tapoatafa</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	The Brush-tailed Phascogale has a patchy distribution around the coast of Australia, from near sea level up to 1,500 m (Soderquist, 1995). Within NSW, the species appears to be most abundant in the north-east and south-east of the State, particularly within forest habitats on the Great Dividing Range (Dickman and Read, 1992; Ayers <i>et al.</i>, 1996). The preferred habitat of the Brush-tailed Phascogale is dry sclerophyll open forest, with a sparse ground cover of herbs, grasses, scleromorphic shrubs or leaf litter (Soderquist, 1995). However, individuals may also inhabit heathland, swamps, rainforest and wet sclerophyll forest (Dickman and McKechnie, 1985). The species occurs primarily where the annual rainfall exceeds 500 mm (Traill and Coates, 1993). No Brush-tailed Phascogales were observed during the field survey. However habitat possibly suitable for this species was observed.
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of this species (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of habitat and loss of hollow-bearing trees.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	Approximately X ha of suitable habitat for the Brush-tailed Phascogale was identified within the proposal site. The linear nature of the proposal site within an already fragmented and disturbed landscape is not likely to result in fragmentation of habitat for these species. The clearing would result in the removal of potential foraging habitat and a small number of hollow-bearing trees. Provided that any removed hollows are recycled and attached to adjacent trees, it is unlikely that the habitat to be removed for the proposed corridor would affect the long-term survival of the species.
Will the action affect critical habitat?	There is no listed critical habitat for this species.
Will the action be consistent with any recovery or action plans?	There are no recovery plans for the brush-tailed phascogale. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.

Brush-tailed Phascogale (<i>Phascogale tapoatafa</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) clearance of native vegetation. 2) loss of hollow-bearing trees The proposal has some potential for contributing to point 1 through the proposed removal of a maximum of 6.96 ha of woodland vegetation. The linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution to this key threatening process. The proposal has the potential to remove hollow-bearing trees which could contribute to point 2. Provided that any removed hollows are recycled and attached to adjacent trees, then the proposal is unlikely to make a significant contribution to this threatening process.
Conclusion	The proposal would involve the disturbance of marginal foraging and possibly breeding habitat for the Brush-tailed Phascogale. This disturbance will be minimal due to the linear nature of the proposal and minimal amount of removal of this vegetation required. Within the vicinity of the proposal site there exists large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat such the proposal would be unlikely to have a significant impact on any local populations.
References	Ayers, D., Nash, S. and Baggett, K. (1996). <i>Threatened Species of Western New South Wales</i>. NSW National Parks and Wildlife Service, Hurstville, NSW. DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i>. Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx. Accessed November 2010. Dickman, C.R. and McKechnie, C.A. (1985). A survey of the mammals of Mount Royal and Barrington Tops, New South Wales. <i>Australian Zoologist</i>, 21: 531-543. Dickman, C.R. and Read, D.G. (1992). „The biology and management of Dasyurids in the arid zone in NSW“. <i>Species Management Report Number 11</i>. NSW National Parks and Wildlife Service, Hurstville, NSW. Soderquist, T. (1993). <i>Survey Methods for Tuans in Southeast New South Wales</i>. Unpublished report to the Forestry Commission of New South Wales. Soderquist, T. (1995). „Brush-tailed Phascogale <i>Phascogale tapoatafa</i>“, in R. Strahan (ed.). <i>The Mammals of Australia</i>. Reed Books, Chatswood. Traill, B. and Coates, T. (1993). Field Observations on the Brush-tailed Phascogale <i>Phascogale tapoatafa</i>. <i>Australian Mammalogy</i>, 16(1): 61-65.

Koala (<i>Phascolarctos cinereus</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	The Koala has a fragmented distribution throughout eastern Australia (Martin and Handasyde, 1995). In NSW, the Koala mainly occurs on the central and north coasts (Reed and Lunney, 1990), although some populations occur in the western regions. Koalas have been observed to feed on the leaves of approximately 70 species of eucalypt and 30 non-eucalypt species (Phillips, 1990). However, in any one area, koalas will feed almost exclusively on a small number of preferred species. The preferred tree species vary widely on a regional and local basis (Hindell and Lee, 1990). No koalas were observed during the field survey. However habitat possibly suitable for this species was observed.
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of this species (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of habitat and Koala food trees.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	Approximately 2.46 ha of woodland that contain a species of Koala feed tree (Forest Red Gum) would be removed or modified by the proposal. Koalas have large home ranges and may occasionally use some of the Forest Red Gum trees in the proposal site. However, the understory is significantly disturbed in most areas and the patches are isolated from other patches of woodland, making the habitat low quality for this species. The proposal would likely result in minor losses of connectivity in linear remnant vegetation located adjacent to roadways and rivers along the proposal site. However due to the relatively small width of the corridor, the current level of fragmentation in the surrounding area and the already disturbed nature of the proposal site, it is unlikely that the proposed corridor would have a significant impact on the habitat of the koala. The vegetation to be removed contains on occasion Koala food trees, however the low frequency of these trees does not constitute „at least 15 % of the total number of trees in the upper or lower strata of the tree component“, and hence the proposal is not inconsistent with SEPP 44 Koala Habitat Protection. Also other suitable habitat would remain adjacent to the corridor.

Koala (<i>Phascolarctos cinereus</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Will the action affect critical habitat?	There is no listed critical habitat for this species.
Will the action be consistent with any recovery or action plans?	The approved <i>NSW Koala Recovery Plan</i> (DECCW, 2008) contains seven objectives: 1) To conserve koalas in their existing habitat. 2) To rehabilitate and restore Koala habitat and populations. 3) To develop a better understanding of the conservation biology of koalas. 4) To ensure that the community has access to factual information about the distribution, conservation and management of koalas at a national, state and local scale. 5) To manage captive, sick or injured koalas and orphaned wild koalas to ensure consistent and high standards of care. 6) To manage over-browsing to prevent both Koala starvation and ecosystem damage in discrete patches of habitat. 7) To coordinate, promote the implementation, and monitor the effectiveness of the <i>NSW Koala Recovery Plan</i> across NSW. The proposal may be inconsistent with the first objective. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) clearance of native vegetation. The proposal has some potential for contributing to point 1 through the proposed removal of a maximum of 2.46 ha of woodland vegetation. The linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution to this key threatening process.
Conclusion	The proposal would involve the disturbance of marginal foraging and possibly breeding habitat for the Koala. This disturbance will be minimal due to the linear nature of the proposal and minimal amount of removal of this vegetation required. Within the vicinity of the proposal site there exists large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat such the proposal would be unlikely to have a significant impact on any local populations.
References	DECC (2008). <i>Recovery plan for the Koala (Phascolarctos cinereus)</i>. Department of Environment and Climate Change, Sydney. DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i>. http://www.threatenedspecies.environment.nsw.gov.au/index.aspx. Accessed November 2010. Hindell, M.A. and Lee, A.K. (1990). „Tree preferences of the Koala, pp 117-121 in A.K Lee, K.A. Handasyde and G.D. Sanson (eds). <i>Biology of the Koala</i>. Surrey Beatty and Sons, Sydney. Martin, R.W. and Handasyde, K.A. (1995). „Koala <i>Phascolarctos cinereus</i> (Goldfuss, 1817)“, pp, 195-198 in R. Strahan (ed.). <i>The Mammals of Australia</i>. Reed Books, Chatswood. Mitchell, P. and Martin, R. (1990). „The structure and dynamics of Koala populations - French Island in perspective“, pp 97-108 in A.K. Lee, K.A. Handasyde and G.D. Sanson (eds). <i>Biology of the Koala</i>. Surrey Beatty and

Koala (<i>Phascolarctos cinereus</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
	Sons, Sydney. Phillips B. (1990). <i>Koalas: the little Australians we'd all hate to lose</i>. Australian National Parks and Wildlife Service, Canberra. Phillips, S.S. (2000). <i>Tree species preferences of the Koala Phascolarctos cinereus as a basis for the delineation of management areas for recovery planning in New South Wales</i>. Unpublished report to the Department of Environment and Climate Change, Sydney. Reed, P.C. and Lunney, D. (1990). „Habitat loss: the key problem for the long-term survival of koalas in New South Wales“, in D. Lunney, C.A. Urquhart and P.C. Reed (eds). <i>Koala Summit: Managing Koalas in New South Wales</i>. NSW National Parks and Wildlife Service. Hurstville, NSW. Gall, B.C. (1980). Aspects of the ecology of the Koala, <i>Phascolarctos cinereus</i> (Goldfuss), in Tucki Tucki Nature Reserve, New South Wales. <i>Australian Wildlife Research</i>, 7: 167-176.

Striped Legless Lizard (<i>Delmar impar</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	In NSW, the Striped Legless Lizard occurs at sites near Goulburn, Yass, Queanbeyan, Cooma and Tumut areas. The species utilises grasslands dominated by perennial, tussock forming native grasses such as kangaroo grass (<i>Themeda australis</i>), spear-grasses (<i>Austrostipa</i> sp.) and poa tussocks (<i>Poa</i> sp.) and occasionally wallaby grasses (<i>Austrodanthonia</i> sp.). Despite this usual occupation of natural temperate grasslands (NTG), the Striped Legless Lizard has also been found in adjacent grasslands which have a high exotic component (DECCW 2010). No Striped Legless Lizards were recorded during the field survey. However habitat possibly suitable for this species was observed.
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of the Striped Legless Lizard (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the disturbance of grassy habitat containing rocks.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	Limited suitable habitat for the Striped Legless Lizard would be impacted on by the proposal. The proposal would involve up to 210 ha of disturbance to paddocks and grasslands, as a result of a 30 m wide clearing in already disturbed environments. However as the majority of this area is not dominated by native grassland species, or containing rocky outcrops, the amount of possible habitat impacted by the proposal is limited. Following construction the clearing would be rehabilitated with grasses and any removed rocks would be reinstated. As a result there is unlikely to be an increase in possible habitat fragmentation or isolation, or any long-term decrease in possible habitat for the Striped Legless Lizard. The proposal is unlikely to affect the long term survival of the species.
Will the action affect critical habitat?	There is no listed critical habitat for this species.

Striped Legless Lizard (<i>Delmar impar</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Will the action be consistent with any recovery or action plans?	There are no current recovery plans for the Striped Legless Lizard. An outdated recovery plan „National recovery plan for the Striped Legless Lizard (<i>Delmar impar</i>) 1999-2003" (NSW NPWS, 1999) exists, however the proposal is not inconsistent with any of the specific objectives outlined within this recovery plan. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) removal of rock. The proposal has some potential for contributing to point 1 through the removal of rock within the corridor. However, provided that the removed rocks are placed in adjacent habitat or reinstated back along the corridor following construction then the proposal would be unlikely to make a significant contribution.
Conclusion	The proposal would involve the disturbance of possible habitat in the form of occasional rocky outcrops dominated by largely non-native grassland. As the disturbed grassland would be revegetated following works, and any removed rocks would be reinstated, the proposal would be unlikely to have a significant impact on any possible local population of Striped Legless Lizard.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i>. Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx. Accessed November 2010. NSW NPWS (1999). <i>National recovery plan for the Striped Legless Lizard (Delmar impar) 1999-2003</i>. Available at: http://www.environment.gov.au/biodiversity/threatened/publications/recovery/striped-legless-lizard/index.html

Pink-tailed Worm-lizard (*Aprasia parapulchella*): Vulnerable

Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	The Pink-tailed Worm-lizard is lizard is known from four sites in eastern Australia: near Canberra in the ACT, Tarcutta and Bathurst in NSW, and near Bendigo in Vic. The species occurs in open grassland habitats that have a substantial cover of small rocks, with predominantly native grasses. However some specimens have been collected from grassland sites that appear not to support any native grasses (DECCW, 2010). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks. No Pink-tailed Worm-lizards were observed during the field survey. However habitat possibly suitable for this species was observed.
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of Pink-tailed Worm-lizards (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the disturbance of grassy habitat containing rocks.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	Limited suitable habitat for the Pink-tailed Worm-lizard would be impacted on by the proposal. The proposal would involve up to 210 ha of disturbance to paddocks and grasslands, as a result of a 30 m wide clearing in already disturbed environments. However as the majority of this area is not dominated by native grassland species, or containing rocky outcrops, the amount of possible habitat impacted by the proposal is limited. Following construction the clearing would be rehabilitated with grasses and any removed rocks would be reinstated. As a result there is unlikely to be an increase in possible habitat fragmentation or isolation, or any long-term decrease in possible habitat for the Pink-tailed Worm-lizard. The proposal is unlikely to affect the long term survival of the species.
Will the action affect critical habitat?	There is no listed critical habitat for this species.

Pink-tailed Worm-lizard (<i>Aprasia parapulchella</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Will the action be consistent with any recovery or action plans?	There are no recovery plans for the Pink-tailed Worm-lizard. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) removal of rock. The proposal has some potential for contributing to point 1 through the removal of rock within the corridor. However, provided that the removed rocks are placed in adjacent habitat or reinstated back along the corridor following construction than the proposal would be unlikely to make a significant contribution.
Conclusion	The proposal would involve the disturbance of possible habitat in the form of occasional rocky outcrops dominated by largely non-native grassland. As the disturbed grassland would be revegetated following works, and any removed rocks would be reinstated, the proposal would be unlikely to have a significant impact on any possible local population.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i> . Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx . Accessed November 2010.

Rosenberg's Goanna (<i>Varanus rosenbergi</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
Description	Rosenberg's Goanna is distributed in NSW from the Wollemi National Park to Goulburn and in the ACT region. Also occurs in South Australia and Western Australia. The species inhabits heath, open forests and woodlands. This species depends on termite mounds for nesting. The diet consists of carrion, birds, eggs, reptiles and small mammals. Rosenberg's Goanna shelters in hollow logs, rock crevices and burrows (DECCW, 2010). No Rosenberg's Goanna were observed during the field survey. However habitat possibly suitable for this species in the form of disturbed woodlands was observed
For a threatened species, will the action have an adverse effect on the life cycle of the species, such that it may face extinction?	The proposal would not impact directly on any aspect of the life cycle of Rosenberg's Goanna (e.g. breeding, migration and dispersion, gene flow, etc.). It may impact indirectly through the removal of habitat and removal of dead wood and fallen timber.
For an endangered population, will the action have an adverse effect on the life cycle of the species in the endangered population, such that it may face extinction?	NA
For an ecological community, is the action likely to 1) have an adverse effect on the extent of the ecological community such that it is at risk of extinction 2) substantially and adversely modify the composition of the ecological community so that it could be at risk of extinction.	NA
For a threatened species, population or ecological community 1) to what extent is the habitat likely to be removed or modified; 2) will the habitat become fragmented or isolated from other areas of habitat; and 3) how important is the habitat that will be removed, modified or fragmented to the long-term survival of the species, population or ecological community in the locality.	Suitable habitat for the Rosenberg's Goanna was identified within the proposal site in the form of remnant native vegetation. The proposal involves the removal of 2.46 ha of woodland and grassy understorey. Small patches of disturbed eucalypt woodlands with limited connectivity are transacted by the proposal totalling approximately 2.3 km of previously disturbed remnant native vegetation. Due to the limited amount required to be cleared in the narrow construction corridor, the already fragmented nature, and the linear nature of the proposal, impact on remnant vegetation and suitable habitat for the Rosenberg's Goanna would be minimal. No termite mounds were recorded during the field surveys but termite mounds could potentially occur along the corridor. The area is already fragmented by roads and agricultural clearings. The habitat may provide limited foraging opportunities for the species and if termite mounds are located along the corridor nesting sites may also be impacted. However, other suitable habitat would remain adjacent to the corridor. The proposal would result in a 30 m wide clearing, in already disturbed environments. The clearing would result in the removal of woodlands which could provide foraging habitat for the Rosenberg's Goanna. Nesting sites for this species may also be removed however, it is unlikely that the habitat to be

Rosenberg's Goanna (<i>Varanus rosenbergi</i>): Vulnerable	
Relevant criteria from s92 of the TSC Act	Assessment of Impact
	removed for the proposed corridor would affect the long-term survival of the species.
Will the action affect critical habitat?	There is no listed critical habitat for this species.
Will the action be consistent with any recovery or action plans?	There are no recovery plans for the Rosenberg's Goanna. The proposal would not be inconsistent with the objectives of any relevant threat abatement plan.
Does the action constitute or is part of a key threatening process for the species, population or ecological community.	Of the 35 key threatening processes listed for NSW by DECCW (2010), the following are relevant to the location, the proposal and the species: 1) clearance of native vegetation. 2) removal of dead wood and fallen trees. The proposal has some potential for contributing to point 1 through the proposed removal of a maximum of 6.96 ha of woodland vegetation. The linear nature and narrow corridor of the proposal would be unlikely to make a significant contribution to this key threatening process. The proposal has some potential for contributing to point 2 through the removal of dead and fallen timber within the corridor. However, provided that the removed timber and logs are placed in adjacent habitat or reinstated back along the corridor following construction then the proposal would be unlikely to make a significant contribution.
Conclusion	The proposal would involve the disturbance of marginal foraging and possibly breeding habitat for the Rosenberg's Goanna. This disturbance will be minimal due to the linear nature of the proposal and minimal amount of removal of this vegetation required. Within the vicinity of the proposal site there exists large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat such the proposal would be unlikely to have a significant impact on any local populations.
References	DECCW (2010). <i>Threatened species, populations and ecological communities of NSW</i> . Available at: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx . Accessed November 2010.

Appendix B-C

EPBC Assessment of Significant Impact for Threatened Species

1.0 EPBC Assessment of Significant Impact for threatened Species

Ten EPBC listed threatened flora and fauna species and ecological communities have potential habitat along the proposed corridor. These are:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Yass Daisy (*Ammobium craspedioides*)
- Hoary Sunray (*Leucochrysum albicans* var. *tricolor*)
- Regent Honeyeater (*Anthochaera phrygia*)
- Swift Parrot (*Lathamus discolor*)
- Superb Parrot (*Polytelis swainsonii*)
- Pink-tailed Worm-lizard (*Aprasia parapulchella*)
- Striped Legless Lizard (*Delma impar*)
- Spotted-tailed Quoll (*Dasyurus maculatus*)
- Greater Long-eared Bat (*Nyctophilus corbeni*)

These species and communities are assessed for potential impact according to the guidelines in the *Matters of National Environmental Significance- Significant Impact Guidelines 1.1* (DEWHA 2009).

1.1 White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Box-Gum Woodland): Critically Endangered Ecological Community

The EPBC Box-Gum Woodland can occur as Box-Gum Grassy Woodland or as a Derived Native Grassland, which is grassy woodland from which the trees have been removed. Yellow Box (*Eucalyptus melliodora*) and / or Blakely's Red Gum (*E. blakelyi*) are commonly dominant or co-dominant. The ground layer of the community consists of native tussock grasses, herbs and scattered shrubs (Department of the Environment and Heritage (DEH) 2006).

This community was formally widespread along the western slopes and tablelands of the Great Dividing Range, throughout southern Queensland, western New South Wales, the Australian Capital Territory and Victoria. Now less than five per cent remains in good condition and much of this occurs in small isolated patches (DEH 2006).

Would the action reduce the extent of an ecological community?

Three sites within the study area meet the definition of EPBC Box-Gum Woodland. The total length of the study area that meets the EPBC Box-Gum Woodland definition is 0.83 km and the width of the right of way (ROW) is 20 m. Therefore, the maximum area of EPBC Box-Gum Woodland to be affected by the construction of the proposed pipeline is 1.66 ha. No further vegetation removal is expected to be required during operation of the pipeline, other than potential easement maintenance activities which would be contained to the ROW.

The proposed pipeline will follow the previously disturbed route of the existing pipeline and share the existing ROW. The construction ROW within the three sections of EPBC Box-Gum Woodland will be narrowed to not more than 20 m to ensure minimal impact to the ecological community. The result of the reduced ROW width is that the maximum amount of remnant vegetation classified as EPBC Box-Gum Woodland required to be cleared has been minimised to 12 mature trees, and the majority of disturbance will be confined to the native-dominated grassy understory and immature trees.

Would the action fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines?

The proposed action will have a linear impact on vegetation for the length of the pipeline. The vegetation to be cleared from with the three patches of EPBC Box-Gum Woodland is in total 20 m wide by 0.83 km in length. The three patches of EPBC Box-Gum Woodland have been highly fragmented by agricultural land use practices and the construction of the existing pipeline in 1980. The proposed action will further fragment all three patches of EPBC Box-Gum Woodland due to the linear nature of the impact. However, the 20 m width of disturbance is not a substantial barrier to most species movement through the ecological community and is expected to be quickly rehabilitated with replacement shallow-rooted native understory vegetation.

Would the action adversely affect habitat critical to the survival of an endangered ecological community?

There is no habitat considered critical to the survival of EPBC Box-Gum Woodland present along the proposed pipeline route.

Would the action modify, destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns?

The proposed action will not substantially modify groundwater or surface water flows in the study area.

Would the action cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting?

The proposed action will not cause a change in the species composition or a decline in functionally important species in the remaining EPBC Box-Gum Woodland adjacent to the pipeline route. Vegetation within the area of disturbance will be completely removed. However, assisted and natural regeneration of the disturbance area with shallow-rooted native understory vegetation will see the return of the original species composition of the ecological community.

Would the action cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: assisting invasive species that are harmful to the

listed ecological community to become established, or causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community?

The proposed action will not cause a substantial reduction in the quality or integrity of EPBC Box-Gum Woodland retained in the study area. Invasive species will be managed within the entire disturbance area for a minimum of two years post-construction. Noxious weeds and other environmental weeds have been mapped along the pipeline route to assist with weed control planning and measures. The proposal will not cause chemicals or pollutants to enter into the EPBC Box-Gum Woodland areas. A Construction Environmental Management Plan (CEMP) will be developed in consultation with the NSW Office of Environment and Heritage to manage environmental issues assessed, and implement identified mitigation and management measures where required.

Would the action interfere with the recovery of an ecological community?

The small scale of the proposal is unlikely to interfere with the recovery of EPBC Box-Gum Woodland.

References

DEH (2006). EPBC Act Policy Statement – White Box – Yellow Box – Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands. Department of the Environment and Heritage, May 2006.

1.2 Yass Daisy

Yass Daisy (*Ammobium craspedioides*): Vulnerable

Yass Daisy grows in moist or dry forest communities, Box-gum Woodland and derived grasslands. It grows in association with a large range of eucalypts (*Eucalyptus blakelyi*, *E. bridgesiana*, *E. dives*, *E. goniocalyx*, *E. macrorhyncha*, *E. mannifera*, *E. melliodora*, *E. polyanthemus* and *E. rubida*). Yass Daisy is apparently unaffected by light grazing, as populations persist in some grazed sites (DEWHA, 2006).

Yass Daisy is known from localities in NSW near Crookwell, on the southern tablelands to near Wagga Wagga, on the south western slopes. Most populations occur in the Yass District, at Lake Burrinjuck, Bookham, Rye Park and Dalton (DEWHA, 2006).

The species was not detected in the study area during field surveys.

Would the action lead to a long-term decrease in the size of an important population of a species?

An important population of the species is not known in the study area or its vicinity.

Would the action reduce the area of occupancy of an important population?

If the Yass Daisy is present in the disturbance area, the small scale of the proposed project would be unlikely to reduce the area of occupancy of a local population. The proposed project would involve vegetation clearing of only a small area of approximately 1.66 ha.

Would the action fragment an existing important population into two or more populations?

If the Yass Daisy is present in the proposal site, it is unlikely that the proposed action would fragment the population into two populations because the width of disturbance in suitable habitat for this species (Box-gum Woodland) is 20 m. Reproduction of the species would most likely occur across a gap of this width.

Would the action adversely affect habitat critical to the survival of a species?

No critical habitat has been declared for the Yass Daisy.

Would the action disrupt the breeding cycle of an important population?

The proposed action would not impact directly on any aspect of the life cycle of the Yass Daisy (e.g. pollination and pollinators, seed dispersal and germination, local fire regimes, etc.).

Would the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

Approximately 1.66 ha of potential habitat for Yass Daisy would be cleared for the proposed action. This vegetation (Box-gum Woodland) is already disturbed and fragmented by agricultural practices and the existing pipeline. This small-scale reduction in habitat would be unlikely to result in the species' decline.

Would the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

The proposed project would not result in the introduction of any harmful or invasive species being introduced to the study area.

Would the action introduce disease that may cause the species to decline?

The proposed project would not lead to the introduction of any diseases that are potentially harmful to the Yass Daisy.

Would the action interfere substantially with the recovery of the species?

The proposed project would not interfere substantially with the recovery of the Yass Daisy.

References

DEWHA (2008). Approved Conservation Advice for *Ammobium craspedioides* (Yass Daisy). Available at <http://www.environment.gov.au/biodiversity/threatened/species/pubs/20758-conservation-advice.pdf>. Accessed August 2011.

1.3 Hoary Sunray

Hoary Sunray (*Leucochrysum albicans* ssp. *albicans* var. *tricolor*): Endangered

The most widespread and common of the two subspecies and three varieties of this species is subsp. *albicans* var. *albicans* from the ranges of south-east Queensland to the Victorian Midlands, growing in grassland and eucalypt woodland vegetation communities, with scattered occurrences at either extreme extending into drier areas (Florabank, 2011).

The species was not detected in the study area during field surveys.

Would the action lead to a long-term decrease in the size of a population?

A population of the species is not known in the study area or its vicinity.

Would the action reduce the area of occupancy of the species?

If the Hoary Sunray is present in the proposal site the small scale of the proposed project would be unlikely to reduce the area of occupancy of a local population. The proposed project would involve vegetation clearing of only a small area of approximately 1.66 ha.

Would the action fragment an existing population into two or more populations?

If the Hoary Sunray is present in the proposal site, it is unlikely that the proposed project would fragment the population into two populations because the site is already dissected by the railway corridor.

Would the action adversely affect habitat critical to the survival of a species?

No critical habitat has been declared for the Hoary Sunray.

Would the action disrupt the breeding cycle of a population?

The proposed project would not impact directly on any aspect of the life cycle of the Hoary Sunray (e.g. pollination and pollinators, seed dispersal and germination, local fire regimes, etc.).

Would the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

Approximately 1.66 ha of potential habitat for Hoary Sunray would be cleared for the proposed project. This vegetation (Box-gum Woodland) is already disturbed and fragmented by agricultural practices and the existing pipeline. This small-scale reduction in habitat would be unlikely to result in the species' decline.

Would the action result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat?

The proposed project would not result in the introduction of any harmful or invasive species being introduced to the study area.

Would the action introduce disease that may cause the species to decline?

The proposed project would not lead to the introduction of any diseases that are potentially harmful to the Hoary Sunray.

Would the action interfere with the recovery of the species?

The proposed project would not interfere substantially with the recovery of the Hoary Sunray.

References

Florabank (2011). *Leucochrysum albicans*. Available at <http://www.florabank.org.au/lucid>. Accessed August 2011.

1.4 Regent Honeyeater, Swift Parrot and Superb Parrot

Regent Honeyeater (*Anthochaera phrygia*): Endangered

The Regent Honeyeater occurs in eucalypt woodlands and open forests. Most records of the species are from box-ironbark eucalypt forest and woodland, lowland coastal forests that are dominated by swamp mahogany (*Eucalyptus robusta*) and spotted gum (*Corymbia maculata*) and riparian forests of river she-oak (*Casuarina cunninghamiana*) (DECCW, 2011). These woodlands have large numbers of mature trees, high canopy cover and an abundance of mistletoes (DECCW, 2011). The seasonal movements of the regent honeyeater are thought to be dependent on spatial and temporal patterns of flowering and other resources (DECCW, 2011).

Nectar comprises the main diet of the regent honeyeater, with 16 species of eucalypt and two species of mistletoe browsed. However, three species of eucalypt make up the predominant nectar sources: mugga ironbark (*Eucalyptus sideroxylon*), White Box (*E. albens*) and Yellow Box (*E. melliodora*) (Webster and Menkhorst, 1992; Higgins *et al.*, 2001). Lerps and honeydew comprise a large proportion of the diet when nectar is scarce. Insects comprise a smaller dietary component but are important for nestlings (DECCW, 2011).

Swift Parrot (*Lathamus discolor*): Endangered

The Swift Parrot is migratory, breeding in Tasmania and migrating north in the autumn and winter months. In NSW, it occurs on the coast and southwest slopes (DECCW, 2011).

The Swift Parrot is found in NSW foraging in forests of medium to large trees (Kennedy, 2000; Kennedy & Overs, 2001; Saunders, 2002) where eucalypts are flowering profusely or where there are abundant lerp infestations. Associated feed trees include winter flowering species such as swamp mahogany (*Eucalyptus robusta*), spotted gum (*Corymbia maculata*), red bloodwood (*C. gummifera*), mugga ironbark (*E. sideroxylon*), and White Box (*E. albens*). Commonly used lerp infested trees include inland grey box (*E. macrocarpa*), grey box (*E. moluccana*) and blackbutt (*E. pilularis*) (DECCW, 2011).

Superb Parrot (*Polytelis swainsonii*): Vulnerable

The Superb Parrot is distributed throughout eastern inland NSW. It is migratory and breeds between Cowra, Yass, Grenfell, Cootamundra and Coolac. After breeding the species moves north to the Namoi and Gyndir Rivers. They inhabit box-gum, box-cypress and boree woodlands and river red gum forest. The diet consists mainly of grass seeds, herbaceous plants, fruits, berries, nectar and grain. It feeds in trees as well as on the ground. It breeds between September and January (DECCW, 2011).

These three woodland bird species were assessed together due to their similar habitat requirements.

Would the action lead to a long-term decrease in the size of an important population of a species?

The field investigations did not identify any important populations within the proposal site of the above species. A search of the area utilising the Atlas of NSW Wildlife Database identified previous recordings of the above species within 10 km of the proposal site. None of the above species were observed during the field investigations of the proposal site.

Suitable habitat for the above species was identified within the proposal site in the form of remnant native vegetation, however impact on this habitat from the proposal would be minimal and this habitat is not confined to the proposal site. The proposal involves the construction of a proposed new 70 km long pipeline which would be located in an existing 20 m wide easement, adjacent to an existing single line gas pipeline. The majority of the proposal site is cleared (approximately 67.7 km or 96.7%), with a dense ground cover of exotic pasture grasses. Construction of the proposal would require a 30 m wide clearing which would be largely contained within the existing 20 m wide clearing adjacent the existing pipeline.

Small patches of disturbed eucalypt woodlands with limited connectivity are transacted by the proposal totalling approximately 2.3 km of previously disturbed remnant native vegetation. Due to the limited amount required to be cleared in the narrow construction corridor and the linear nature of the proposal, impact on remnant vegetation and suitable habitat for the above species would be minimal.

The area of habitat impacted by the proposal is not considered significant in relation to the amount of similar habitat available for the above species in the broader locality that would remain unaffected. Although the proposal may temporarily affect the dynamics and habitat use of any local populations of these species, it is unlikely to result in a long-term decrease in the size of any local populations.

Would the action reduce the area of occupancy of an important population?

The field investigations did not identify any important populations within the proposal site of the above species. The proposal would affect only marginal foraging resources for these species (and possibly breeding resources for the Superb Parrot), however in light of the mobility of these species and the amount of similar habitat unaffected in the broader locality, it is not considered that this would reduce the area of occupancy of these species.

Would the action fragment an existing important population into two or more populations?

The field investigations did not identify any important populations within the proposal site of the above species. The proposal would not result in the fragmentation of any populations due to the narrow linear nature of the proposal, the current level of fragmentation in the surrounding area, the small amount of remnant vegetation required to be removed and the mobility of these species.

Would the action adversely affect habitat critical to the survival of a species?

The potential habitat within the proposal site is not considered to be habitat critical to the survival of these species.

Would the action disrupt the breeding cycle of an important population?

The proposal is not located within known breeding areas for the Swift Parrot, which breeds in Tasmania, or the Regent Honeyeater, whose key breeding regions in NSW are at Capertee Valley and the Bundarra-Barraba region (DECCW, 2011).

The potential habitat located within proposal site exists within the known breeding area of the Superb Parrot. The Superb Parrot has known breeding area within approximately 5 km of the proposal site around the town of Cootamundra (DECCW, 2011). Given the minimal amount of suitable breeding habitat within the proposal site, the linear and minimal amount of disturbance to this vegetation, the provision of a suitably qualified person to conduct wildlife clearance surveys, and the availability of adjacent suitable habitat, it is not expected that there would be any significant disruption to the breeding cycle of Superb Parrot within or adjacent to the proposal.

Would the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

The proposal would involve the disturbance of marginal foraging habitat (and possibly breeding habitat for the Superb Parrot). This disturbance will be minimal due to the linear nature of the proposal and minimal amount of removal of this vegetation required. Within the vicinity of the proposal site there exists large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat such that these species would be likely to decline.

Would the action result in invasive species that are harmful to a vulnerable or endangered species becoming established in the species' habitat?

It is not expected that any invasive species that are harmful to these species would become established as a result of the proposal.

Would the action introduce disease that may cause the species to decline?

No. There are no known diseases that are likely to be introduced in the area as a result of the proposal.

Would the action interfere substantially with the recovery of the species?

Based on the potential ecological impacts of the proposal on the Regent Honeyeater, Swift Parrot and Superb Parrot as discussed above, it is unlikely that the construction and operation of the proposal would interfere with the recovery of these species.

References

DECCW (2011). Threatened species, populations and ecological communities of NSW. Available at: <http://www.threatenedspecies.environment.nsw.gov.au/index.aspx>. Accessed July 2011.

DSEWPC (2011). *Species Profile and Threats Database*. Available at: <http://www.environment.gov.au/sprat>. Accessed January 2011.

Higgins, P.J., Steel, W.K. and Peter, J.M., eds (2001). Handbook of Australian, New Zealand and Antarctic Birds, vol. 5, Tyrant-flycatchers to Chats. Oxford University Press, Melbourne.

NPWS (1999). Threatened Species Information Sheet: Regent Honeyeater. NSW National Parks and Wildlife Service, Hurstville, NSW.

Webster, R. and Menkhorst, P. (1992). The Regent Honeyeater (*Xanthomyza phrygia*): Population status and ecology in Victoria and New South Wales. Arthur Rylah Institute for Environmental Research Technical Report No. 126. Victorian Department of Conservation and Natural Resources, Melbourne.

1.5 Spotted-tailed Quoll

Spotted-tailed Quoll (*Dasyurus maculatus*): Endangered

The Spotted-tailed Quoll occurs along the east coast of Australia from north-eastern Queensland through NSW and Victoria to Tasmania, with a disjunct distribution.

The Spotted-tailed Quoll occupies a range of environments, including sclerophyll forest and woodlands, coastal heathlands and rainforests (Dickman and Read, 1992; Edgar and Belcher, 1995; DECCW, 2011). Occasional records come from open country, grazing lands, rocky outcrops and other treeless areas.

Although mainly terrestrial, the Spotted-tailed Quoll is an agile climber and may raid possum and glider dens and prey on roosting and fledgling birds. Nesting occurs in rock shelters, hollow logs, caves or tree hollows and individuals may use numerous dens within their home range. Estimates of home range size vary from 800 ha to 20 km² and individuals may move several kilometres in a night (Edgar and Belcher, 1995). Breeding occurs from April to July with an average litter size of five (Edgar and Belcher, 1995).

Prey items include gliders and possums, small wallabies, rats, birds, bandicoots, rabbits, insects and carrion.

The Spotted-tailed Quoll is threatened by a number of processes including loss, fragmentation and degradation of habitat through clearing of native vegetation and subsequent development, logging and frequent fire (Edgar and Belcher, 1995; Dickman and Read, 1992). The loss of large hollow logs and other potential den sites (Scotts, 1992) is a major problem, as well as competition for food and predation by foxes and cats (Edgar and Belcher, 1995; Dickman and Read, 1992). Cats may also spread parasitic protozoan epidemics to quolls (Edgar and Belcher, 1995; Dickman and Read, 1992). Persecution by humans is still an issue, because humans perceive quolls as a predator on stock and poultry (Edgar and Belcher, 1995; Dickman and Read, 1992). Baiting of dingoes may also result in direct poisoning of spotted-tailed quolls and changes the composition of predators: reduced dingo numbers favours foxes which compete with quolls (Edgar and Belcher, 1995; Dickman and Read, 1992; DECCW, 2011; DSEWPC, 2011).

Would the action lead to a long-term decrease in the size of a population?

The field investigations did not identify any important populations within the proposal site of the Spotted-tailed Quoll. No Spotted-tailed Quolls, or signs indicating presence, were observed during the field investigations of the proposal site.

Suitable habitat for the Spotted-tailed Quoll was identified within the proposal site in the form of remnant native vegetation, however impact on this habitat from the proposal would be minimal and this habitat is not confined to the proposal site. The proposal involves the construction of a proposed new 70 km long pipeline which would be located in an existing 20 m wide easement, adjacent to an existing single line gas pipeline. The majority of the proposal site is cleared (approximately 67.7 km or 96.7%), with a dense ground cover of exotic pasture grasses. Construction of the proposal would require a 30 m wide clearing which would be largely contained within the existing 20 m wide clearing adjacent the existing pipeline.

Small patches of disturbed eucalypt woodlands with limited connectivity are transacted by the proposal totalling approximately 2.3 km of previously disturbed remnant native vegetation. Due to the limited amount required to be cleared in the narrow construction corridor and the linear nature of the proposal, impact on remnant vegetation and suitable habitat for the above species would be minimal.

The area of habitat impacted by the proposal is not considered significant in relation to the amount of similar habitat available for the Spotted-tailed Quoll in the broader locality that would remain unaffected. Although the proposal may temporarily affect the dynamics and habitat use of any local populations of these species, it is unlikely to result in a long-term decrease in the size of any local populations.

Would the action reduce the area of occupancy of the species?

The field investigations did not identify any important populations within the proposal site of the Spotted-tailed Quoll.

The proposal would affect only marginal foraging resources for the Spotted-tailed Quoll, however in light of the mobility of this species and the amount of similar habitat unaffected in the broader locality, it is not considered that this would reduce the area of occupancy of this species.

Would the action fragment an existing population into two or more populations?

The field investigations did not identify any important populations within the proposal site of the Spotted-tailed Quoll. The proposal would not result in the fragmentation of any populations due to the narrow linear nature of the proposal, the current level of disturbance and fragmentation in the area and its surrounds, and the minimal amount of long term disturbance due to the revegetation of the grasslands with shallow-rooted vegetation.

Would the action adversely affect habitat critical to the survival of a species?

The potential habitat within the proposal site is not considered to be habitat critical to the survival of the Spotted-tailed Quoll.

Would the action disrupt the breeding cycle of a population?

The potential habitat located within proposal site exists within the possible breeding area of the Spotted-tailed Quoll, however, limited habitat features suitable for nesting was observed within the proposal site. Given the minimal amount of suitable breeding habitat within the proposal site, the linear and minimal amount of disturbance to this vegetation, the provision of a suitably qualified person to conduct wildlife clearance surveys, and the availability of adjacent suitable habitat, it is not expected that there would be any significant disruption to the breeding cycle of any Spotted-tailed Quolls within or adjacent to the proposal.

Would the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

The proposal would involve the disturbance of marginal foraging habitat and possibly marginal breeding habitat Spotted-tailed Quoll. This disturbance will be minimal due to the linear nature of the proposal and minimal amount of removal of this vegetation required. Within the vicinity of the proposal site there exists large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat such that this species would be likely to decline.

Would the action result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat?

It is not expected that any invasive species that are harmful to these species would become established as a result of the proposal.

Would the action introduce disease that may cause the species to decline?

No. There are no known diseases that are likely to be introduced in the area as a result of the proposal.

Would the action interfere substantially with the recovery of the species?

Based on the potential ecological impacts of the proposal on the Spotted-tailed Quoll as discussed above, it is unlikely that the construction and operation of the proposal would interfere with the recovery of this species.

References

- DECCW (2011). *Threatened species, populations and ecological communities of NSW*. Available at: <http://www.threatenedspecies.environment.nsw.gov.au/index.aspx>. Accessed July 2011.
- Dickman, C.R. and Read, D.G. (1992). „The biology and management of Dasyurids in the arid zone in NSW". *Species Management Report Number 11*. NSW National Parks and Wildlife Service, Hurstville, NSW.
- DSEWPC (2011). *Species Profile and Threats Database*. Available at: <http://www.environment.gov.au/sprat>. Accessed January 2011.
- Edgar, R. and Belcher, C. (1995). „The Spotted-tailed Quoll *Dasyurus maculatus*’, pp. 67-68 in R. Strahan (ed.). *The Mammals of Australia*. Reed Books, Sydney.

1.6 Striped Legless Lizard

Striped Legless Lizard (Delma impar): Endangered

The Striped Legless Lizard utilises NTG dominated by perennial, tussock forming grasses such as kangaroo grass (*Themeda australis*), spear-grasses (*Austrostipa* sp.) and poa tussocks (*Poa* sp.) and occasionally wallaby grasses (*Austrodanthonia* sp.). Despite this usual occupation of Natural Temperate Grassland (NTG), the Striped Legless Lizard has also been found in grasslands which have a high exotic component. The Striped Legless Lizard occurs in the Southern Tablelands, the South West Slopes and possibly on the Riverina. Populations are known in the Goulburn, Yass, Queanbeyan, Cooma and Tumut areas. Also occurs in the ACT, Victoria and south-eastern South Australia (DECCW, 2011; DSEWPC, 2011).

Would the action lead to a long-term decrease in the size of a population?

The field investigations did not identify any important populations within the study area of the Striped Legless Lizard. No individuals of the Striped Legless Lizard observed during the field investigations of the study area.

No suitable habitat, in the form of NTG, for the Striped Legless Lizard was identified within the study area. Some native grass species were observed within the study area however the grassland areas were highly disturbed largely containing exotic pasture grasses and the species composition did not constitute NTG. The EPBC Act Protected Matters database identified no NTG within 10 km of the proposal.

While it is not preferred habitat this species can occupy grasslands containing exotic species. Disturbed grasslands containing largely exotic species were identified within the study area. The proposal involves the construction of a proposed new 70 km long pipeline which would be located in an existing 20 m wide easement, adjacent to an existing single line gas pipeline. The majority of the study area is cleared (approximately 67.7 km or 96.7%), with a dense ground cover of exotic pasture grasses. Construction of the proposal would require a 30 m wide clearing which would be largely contained within the existing 20 m wide clearing adjacent the existing pipeline. Disturbance to cleared/grassland areas within the study area would be temporary, and would be re-established with vegetation following completion of construction works.

Due to the lack of suitable habitat for this species, and the minimal amount of long term disturbance to grasslands within the study area containing largely unsuitable exotic content, the proposal is unlikely to adversely affect either of the Striped Legless Lizard or result in a long-term decrease in the size of any local populations.

Would the action reduce the area of occupancy of the species?

The field investigations did not identify any important populations within the study area of this species. Preferred habitat in the form of NTG was not observed within the study area, and is not known within any adjacent areas.

Due to the lack of suitable habitat for these species, and the minimal amount of long term disturbance to grasslands within the study area containing largely unsuitable exotic content, it is considered unlikely that the proposal would reduce the area of occupancy of this species.

Would the action fragment an existing population into two or more populations?

The field investigations did not identify any important populations within the study area of the above species. The proposal would not result in the fragmentation of any populations due to the narrow linear nature of the proposal, the current level of disturbance and fragmentation in the area and its surrounds, and the minimal amount of long term disturbance due to the revegetation of the grasslands with shallow-rooted vegetation.

Would the action adversely affect habitat critical to the survival of a species?

The potential habitat within the study area is not considered to be habitat critical to the survival of this species.

Would the action disrupt the breeding cycle of a population?

The proposal is not located within known breeding areas for these species.

Given the lack of preferred breeding habitat within the study area in the form of NTG, the minimal amount of long term disturbance to largely unsuitable grassland within the study area due to the revegetation of the grasslands with shallow-rooted vegetation, and the availability of preferred habitat in other areas, it is not expected that there would be any significant disruption to the breeding cycle of this species.

Would the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No preferred habitat for these species was observed within the study area.

The proposal would involve the temporary disturbance of exotic dominated grasslands largely unsuitable for these species. The disturbance as a result of a 30 m wide clearing would be short term as following the construction these disturbed area would be revegetated. As such the proposal would not result in a decrease in locally available quality habitat such that these species would be likely to decline.

Would the action result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat?

It is not expected that any invasive species that are harmful to these species would become established as a result of the proposal.

Would the action introduce disease that may cause the species to decline?

No. There are no known diseases that are likely to be introduced in the area as a result of the proposal.

Would the action interfere substantially with the recovery of the species?

Based on the potential ecological impacts of the proposal on the Golden Sun Moth and Striped Legless Lizard as discussed above, it is unlikely that the construction and operation of the proposal would interfere with the recovery of these species.

References

DECCW (2011). *Threatened species, populations and ecological communities of NSW*. Available at: <http://www.threatenedspecies.environment.nsw.gov.au/index.aspx>. Accessed July 2011.

DSEWPC (2011). *Species Profile and Threats Database*. Available at: <http://www.environment.gov.au/sprat>. Accessed July 2011.

1.7 Greater Long-eared Bat

Greater Long-eared Bat (*Nyctophilus corbeni*): Vulnerable

The Greater Long-eared Bat occurs mainly in the Brigalow Belt South Bioregion from the Expedition Range to the NSW border. The species is usually found in Buloke woodland, brigalow, open forest and mallee forest (DSEWPC, 2010). The species feeds primarily on insects which are taken in flight or gleaned from vegetation or the ground. They fly low in cluttered vegetation and are likely to follow vegetation corridors when moving through the landscape. They rarely travel more than 1 km from their roosting site while foraging (DSEWPC, 2010). Greater Long-eared Bat roosts solitarily under exfoliated bark and in crevices in trees (DSEWPC, 2010).

Would the action lead to a long-term decrease in the size of an important population of a species?

No Greater Long-eared Bats were observed during the field investigations of the proposal site. The field investigations did not identify any important populations within the proposal site of the Greater Long-eared Bat.

Suitable habitat for the Greater Long-eared Bat was identified within the proposal site in the form of remnant native vegetation, however impact on this habitat from the proposal would be minimal and this habitat is not confined to the proposal site. The proposal involves the construction of a proposed new 70 km long pipeline which would be located in an existing 20 m wide easement, adjacent to an existing single line gas pipeline. The majority of the proposal site is cleared (approximately 67.7 km or 96.7%), with a dense ground cover of exotic pasture grasses. Construction of the proposal would require a 30 m wide clearing which would be largely contained within the existing 20 m wide clearing adjacent the existing pipeline.

Small patches of disturbed eucalypt woodlands with limited connectivity are transacted by the proposal totalling approximately 2.3 km of previously disturbed remnant native vegetation. Due to the limited amount required to be cleared in the narrow construction corridor and the linear nature of the proposal, impact on remnant vegetation and suitable habitat for the above species would be minimal.

The area of habitat impacted by the proposal is not considered significant in relation to the amount of similar habitat available for the Greater Long-eared Bat in the broader locality that would remain unaffected. Although the proposal may temporarily affect the dynamics and habitat use of any local populations of these species, it is unlikely to result in a long-term decrease in the size of any local populations.

Would the action reduce the area of occupancy of an important population?

The field investigations did not identify any important populations within the proposal site of the Greater Long-eared Bat.

The proposal would affect only marginal foraging resources for the Greater Long-eared Bat, however in light of the mobility of this species and the amount of similar habitat unaffected in the broader locality, it is not considered that this would reduce the area of occupancy of this species.

Would the action fragment an existing important population into two or more populations?

The field investigations did not identify any important populations within the proposal site of the Greater Long-eared Bat. The proposal would not result in the fragmentation of any populations due to the narrow linear nature of the proposal, the current level of disturbance and fragmentation in the area and its surrounds, and the minimal amount of long term disturbance due to the revegetation of the grasslands with shallow-rooted vegetation.

Would the action adversely affect habitat critical to the survival of a species?

The potential habitat within the proposal site is not considered to be habitat critical to the survival of the Greater Long-eared Bat.

Would the action disrupt the breeding cycle of an important population?

The potential habitat located within proposal site exists within the possible breeding area of the Greater Long-eared Bat. Given the minimal amount of suitable breeding habitat within the proposal site, the linear and minimal amount of disturbance to this vegetation, the provision of a suitably qualified person to conduct wildlife clearance surveys, and the availability of adjacent suitable habitat, it is not expected that there would be any significant disruption to the breeding cycle of any Greater Long-eared Bats within or adjacent to the proposal.

Would the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

The proposal would involve the disturbance of marginal foraging habitat and possibly marginal breeding habitat for the Greater Long-eared Bat. This disturbance will be minimal due to the linear nature of the proposal and minimal amount of removal of this vegetation required. Within the vicinity of the proposal site there exists large areas of quality habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat such that this species would be likely to decline.

Would the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

It is not expected that any invasive species that are harmful to these species would become established as a result of the proposal.

Would the action introduce disease that may cause the species to decline?

No. There are no known diseases that are likely to be introduced in the area as a result of the proposal.

Would the action interfere substantially with the recovery of the species?

Based on the potential ecological impacts of the proposal on the Greater Long-eared Bat as discussed above, it is unlikely that the construction and operation of the proposal would interfere with the recovery of this species.

References

DECCW (2011). *Threatened species, populations and ecological communities of NSW*. Available at: <http://www.threatenedspecies.environment.nsw.gov.au/index.aspx>. Accessed July 2011.

DSEWPC (2011). *Species Profile and Threats Database*. Available at: <http://www.environment.gov.au/sprat>. Accessed July 2011.

1.8 Pink-tailed Worm-lizard

Pink-tailed Worm-lizard (*Aprasia parapulchella*): Vulnerable

The Pink-tailed Worm-lizard is known from four sites in eastern Australia: near Canberra in the ACT, Tarcutta and Bathurst in NSW, and near Bendigo in Vic. The species occurs in open grassland habitats that have a substantial cover of small rocks, with predominantly native grasses. However some specimens have been collected from grassland sites that appear not to support any native grasses (DECCW, 2011). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks.

No Pink-tailed Worm-lizards were observed during the field survey. However habitat possibly suitable for this species was observed.

Would the action lead to a long-term decrease in the size of an important population of a species?

No Pink-tailed Worm-lizards were observed during the field investigations of the proposal site. The field investigations did not identify any important populations within the proposal site of the Pink-tailed Worm-lizard.

Suitable habitat for the Pink-tailed Worm-lizard was identified within the proposal site in the form of grasslands containing on occasion small rocks, however impact on this habitat from the proposal would be minimal and this habitat is not confined to the proposal site. The proposal involves the construction of a proposed new 70 km long pipeline which would be located in an existing 20 m wide easement, adjacent to an existing single line gas pipeline. The majority of the proposal site is cleared (approximately 67.7 km or 96.7%), with a dense ground cover of exotic pasture grasses. Construction of the proposal would require a 30 m wide clearing which would be largely contained within the existing 20 m wide clearing adjacent the existing pipeline.

The proposal would involve up to 210 ha of disturbance to paddocks and grasslands, as a result of a 30 m wide clearing in already disturbed environments. However as the majority of this area is not dominated by native grassland species, or containing rocky outcrops, the amount of habitat possibly suitable for the Pink-tailed Worm-lizard impacted by the proposal is limited. Following construction the clearing would be rehabilitated with grasses and any removed rocks would be reinstated. As a result there is unlikely to be an increase in possible habitat fragmentation or isolation, or any long-term decrease in possible habitat for the Pink-tailed Worm-lizard. The proposal is unlikely to affect the long term survival of the species.

The area of habitat impacted by the proposal is not considered significant in relation to the amount of similar habitat available for the Greater Long-eared Bat in the broader locality that would remain unaffected. Although the proposal may temporarily affect the dynamics and habitat use of any local populations of these species, it is unlikely to result in a long-term decrease in the size of any local populations.

Would the action reduce the area of occupancy of an important population?

The field investigations did not identify any important populations within the proposal site of the Pink-tailed Worm-lizard.

The proposal would affect only marginal foraging resources for the Pink-tailed Worm-lizard, however in light of the amount of similar habitat unaffected in the broader locality, it is not considered that this would reduce the area of occupancy of this species.

Would the action fragment an existing important population into two or more populations?

The field investigations did not identify any important populations within the Pink-tailed Worm-lizard. The proposal would not result in the fragmentation of any populations due to the narrow linear nature of the proposal, the current level of disturbance and fragmentation in the area and its surrounds, and the minimal amount of long term disturbance due to the revegetation of the grasslands with shallow-rooted vegetation.

Would the action adversely affect habitat critical to the survival of a species?

The potential habitat within the proposal site is not considered to be habitat critical to the survival of the Pink-tailed Worm-lizard.

Would the action disrupt the breeding cycle of an important population?

The proposal is not located within known breeding areas of the Pink-tailed Worm-lizard.

Given the lack of known breeding areas within the proposal site of the Pink-tailed Worm-lizard, the minimal amount of long term disturbance to largely unsuitable grassland within the proposal site due to the revegetation of the grasslands shallow-rooted vegetation, and the availability of preferred habitat in other areas, it is not expected that there would be any significant disruption to the breeding cycle of this species.

Would the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

The proposal would involve the disturbance of marginal habitat for the Pink-tailed Worm-lizard. This disturbance will be minimal due to the linear nature of the proposal and the minimal amount of disturbance of this vegetation required. Within the vicinity of the proposal site there exists large areas of similar habitat that would not be affected by the proposal. As such the proposal would not result in a decrease in locally available quality habitat such that this species would be likely to decline.

Would the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

It is not expected that any invasive species that are harmful to these species would become established as a result of the proposal.

Would the action introduce disease that may cause the species to decline?

No. There are no known diseases that are likely to be introduced in the area as a result of the proposal.

Would the action interfere substantially with the recovery of the species?

Based on the potential ecological impacts of the proposal on the Pink-tailed Worm-lizard as discussed above, it is unlikely that the construction and operation of the proposal would interfere with the recovery of this species.

References

DECCW (2011). *Threatened species, populations and ecological communities of NSW*. Available at: <http://www.threatenedspecies.environment.nsw.gov.au/index.aspx>. Accessed July 2010.

DSEWPC (2011). *Species Profile and Threats Database*. Available at: <http://www.environment.gov.au/sprat>. Accessed July 2011.

Appendix B-D

Noxious Weed Report

Appendix B-D Noxious Weed Report

Noxious Weed Report

1.0 Introduction

1.1 Background

East Australian Pipeline Pty Ltd (EAPL) is proposing the installation of approximately 70 km of linear pipeline adjacent to an existing pipeline (within the existing 20 m wide pipeline easement) between Young and Bethungra, New South Wales (the proposal). A 30 m construction easement would be required for construction for the majority of the route (the study area).

AECOM has been commissioned by EAPL, a wholly owned subsidiary of the APA Group Pty Ltd (APA) to prepare an Environmental Assessment (EA) for the proposal in accordance with Part 3A of the EP&A Act as per the Director-General requirements. In support of this EA a detailed Flora and Fauna Report has been prepared, in which field survey was conducted.

During the initial site survey several plant species meeting the criteria of noxious weeds under the NSW *Noxious Weeds Act 1993* (NW Act) and numerous environmental weeds were identified. Specific Kilometre Point (KP) for these species and their distributions were not recorded. Therefore, a further field survey was conducted along the pipeline route with a focus on mapping noxious weeds that require specific quarantine measures.

Some serious weeds are required by law to be controlled by all landholders in an area. Weeds that are declared noxious are those weeds that have potential to cause harm to agriculture, human health or the environment, can be controlled by reasonable means and most importantly, have the potential to spread within an area and to other areas. A weed is declared noxious because its control will provide a benefit to the community over and above the cost of implementing control programs. Noxious weeds are listed in the NW Act by the Lower Government Area (LGA) in which they occur. The study area crosses four LGAs. These include Young Shire, Harden Shire, Cootamundra Shire and Junee Shire.

This Noxious Weed Report forms an attachment to the Flora and Fauna Report.

1.2 Objectives of the Noxious Weed Report

Identifying the specific KP locations and distribution of noxious weeds along the pipeline route will assist in the development of a detailed weed management strategy as part of the Construction Environmental Management Plan (CEMP) required for the proposal. Weed mapping enables the weed management strategy to be location specific in relation to potential weed management and quarantine zones.

2.0 Methodology

2.1 Field Survey

Detailed field survey along the entire pipeline route assessing the occurrence of noxious weeds was conducted between 11 and 20 July 2011. This survey was conducted by two AECOM environmental scientists.

Field survey methods involved identification of patches of noxious weed species within the study area, and subsequent location recording of these patches with both KP and GPS coordinates. All GPS coordinates were taken using hand held GPS with an accuracy of +/- 10 m. A patch was recorded when noxious weed were found to occur together in an area greater than approximately 10 m x 10 m (100 m²). Where patches exceeded an area of approximately 30 m x 30 m (900 m²) the start and end point of the patch was recorded.

Patches of noxious weed species within the study area were mapped according to the coordinates recorded from the field work. These maps are shown in Figures 1 to 18 below.

2.2 Assumptions and Limitations

Due to the time of year of the survey, which occurred in mid-winter, the identification of some of the targeted noxious weeds was made difficult. In particular the noxious weed, Patterson's Curse, grows as a rosette during winter so may have remained undetected in some sections.

3.0 Results

In general, the presence of noxious and environmental weeds and their densities varied along the pipeline route. Some landholdings have heavy infestations of weeds and others appear to have no weeds present. Weeds were generally not present in paddocks under crops and more commonly present in grazing paddocks.

The length of the proposed pipeline is approximately 70 km, largely within a 30 m construction Right of Way (ROW), which, following construction will be rehabilitated or returned as near as practicable to its previous use. In ecologically sensitive areas, the construction ROW will be narrowed to not more than 20 m, to ensure minimal impact. Therefore the temporary construction disturbance area of the proposal will be approximately 210 hectares (ha).

Noxious and environmental weeds were found to occur over a total of length of 16.75 km. Assuming a 30 m ROW disturbance area, the total area of weeds is 50.25 ha or approximately 24 % of the entire proposal. Figures 1 to 18 show the locations of weed infestation and the weed species observed. Plates 1 – 7 show photos of each weed species.

3.1 Noxious Weeds

Four declared noxious weeds were detected in patches greater than 10 m x 10 m along the pipeline route:

- Scotch Thistle (*Onopordum acanthium* subsp. *acanthium*) (Plate 1);
- Sweet Briar (*Rosa rubiginosa*) (Plate 2);
- Bathurst Burr (*Xanthium* sp.) (Plate 3); and
- Paterson's Curse (*Echium* sp.) (Plate 4).

In addition to the above the declared noxious weed species, St John's Wort (*Hypericum perforatum*) was also identified on occasion. As it was not part of a patch of the minimum size for mapping, it is not considered further.

Under the NW Act, noxious weed species are classified into 5 categories:

- Classes 1 and 2: The plant must be eradicated from the land and the land kept free of the plant;
- Class 3: The plant must be fully and continuously suppressed and destroyed;
- Class 4: The growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local authority; and
- Class 5: The requirements in the NW Act for a notifiable weed must be complied with.

All of the noxious weeds recorded along the pipeline are Class 4 weeds in the relevant LGAs.

3.2 Other Weeds

Three other weed species, not declared as noxious within the LGAs of the proposal, were detected regularly in patches greater than 10 m x 10 m within the study area. These are:

- Saffron Thistle (*Carthamus lanatus*) (Plate 5);
- Variegated Thistle (*Silybum marianum*) (Plate 6); and
- Spear Thistle (*Cirsium vulgare*) (Plate 7).

Some weed species are also recognised by the Commonwealth Government as Weeds of National Significance (WONS) based on their:

- Invasiveness and impact characteristics;

- Potential and current area of spread; and
- Current primary industry, environment and socioeconomic impacts.

There were no WONS recorded in the study area during the field survey.

4.0 Discussion and Conclusion

During construction of the proposal, appropriate management measures will need to be implemented to control the spread of weeds. It is noted that management of areas containing existing weed infestations outside of the ROW are not the responsibility of APA, who are responsible only for the management of weeds within the easement, but rather the responsibility of the relevant land owners.

The four noxious and three weed species occurring within the study area utilise differing dispersal mechanisms to spread. Due to this, different management techniques may be required depending on the species observed to control this spread. Table 1 shows the dispersal mechanisms of the relevant weed species.

The four noxious weeds are dispersed mainly by animals (i.e. sheep, cattle and birds). Paterson's Curse seeds lie dormant in soil for several years and can be stimulated to grow with soil disturbance. Scotch Thistle can be spread by cultivation of soil by moving rhizome pieces through the soil.

The three other weeds identified - Saffron Thistle, Variegated Thistle and Spear Thistle - can be spread by mud attached to vehicles and machinery.

Most of the above weed species flower and set seed in the warmer months (spring and summer) with germination in autumn. However, regardless of the season for construction, weed spread prevention measures should be followed in order to reduce the risk of spreading weeds from uncontrolled areas to controlled areas.

Therefore, paddocks infested with Scotch Thistle, Paterson's Curse, Saffron Thistle, Variegated Thistle and Spear Thistle should be identified for weed spread prevention measures during construction of the proposal. Vehicle hygiene during construction is an important weed spread prevention measure.

Specific mitigation measures recommended in the Flora and Fauna Report should be applied in these weed infestation sections and developed into a weed management strategy as part of the CEMP.

For more information about the control and prevention of spread of the above weed species, contact Cootamundra Shire Council's Noxious Weed Inspector, Graeme Worboys on 69402100 or 0407 060 890 (Email gworboys@cootamundra.nsw.gov.au).

5.0 References

Parsons WT and EG Cuthbertson (2001) *Noxious Weeds of Australia, Second Edition*. CSIRO Publishing, Collingwood).

Table 1 Weeds Detected within the Study Area and Dispersal Mechanisms (Parsons and Cuthbertson 2001).

Weed Name		NW Act	Control Class within LGA	Wind	Water	Mud	Vehicles and machinery	Clothing and Fur/Wool	Root pieces	Birds	Grazing animals	Timing
Common Name	Scientific Name											
Scotch Thistle	<i>Onopordum acanthium</i> subsp. <i>acanthium</i>	Yes	Class 4 Young, Harden, Junee and Cootamundra					X	X	X	X	Germinates late summer – autumn and late winter – spring
Sweet Briar	<i>Rosa rubiginosa</i>	Yes	Class 4 Young, Harden, Junee and Cootamundra							X		
Bathurst Burr	<i>Xanthium</i> sp.	Yes	Class 4 Young, Harden, Junee and Cootamundra					X				All year
Paterson's Curse and Viper's Bugloss	<i>Echium</i> sp.	Yes	Class 4 Young and Harden		X		X	X			X	Flowering early spring. Seeds germinate autumn and are stimulated by cultivation
Saffron Thistle	<i>Carthamus lanatus</i>	Yes	Not listed in LGAs of pipeline			X	X	X				Seeds ripen Dec and Jan
Variegated Thistle	<i>Silybum marianum</i>	No	-	X	X	X	X	X				Flowering in spring. Seeds germinate autumn
Spear Thistle	<i>Cirsium vulgare</i>	No	-	X	X	X	X	X				Flowering summer and autumn. Seeds germinate early autumn

Plates

Plate 1:

Scotch Thistle

Onopordum acanthium subsp. *acanthium*



Plate 2:

Sweet Briar

Rosa rubiginosa



Plate 3:

Bathurst Burr

Xanthium sp.



Plate 4:

Paterson's Curse and Viper's Bugloss
Echium sp.



Plate 5:

Saffron Thistle
Carthamus lanatus



Plate 6:

Variegated Thistle
Silybum marianum

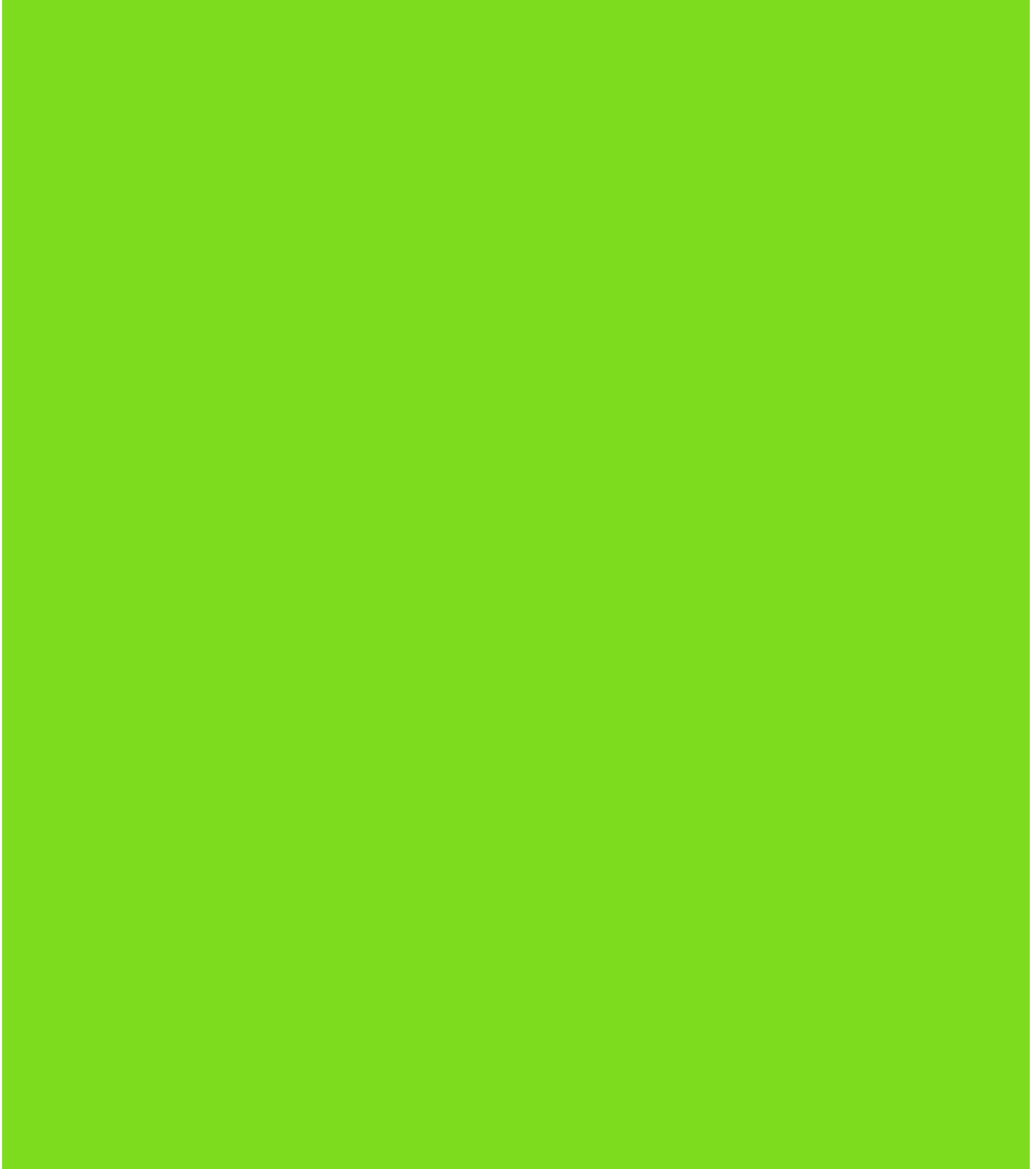


Plate 7:

Spear Thistle
Cirsium vulgare



Figures



Figures 1 -18



- | | | |
|---|---|---|
| <ul style="list-style-type: none"> — Weed area — Gas Pipeline Section 2 ● 1km KP marker ● 200m marker | Noxious Weeds <ul style="list-style-type: none"> ● Sweet Briar ● Scotch Thistle ● Paterson's Curse ● Bathurst Burr | Other Weeds <ul style="list-style-type: none"> ■ Spear Thistle ■ Variegated Thistle ■ Saffron Thistle |
|---|---|---|

YOUNG - WAGGA WAGGA PIPELINE SECTION 2
Weeds Map

Source: LPMA (2010), StreetPro (2009)
 0 250 500 1,000 m
 GDA94 - MGA Zone 55

15 Aug 2011
 60189491

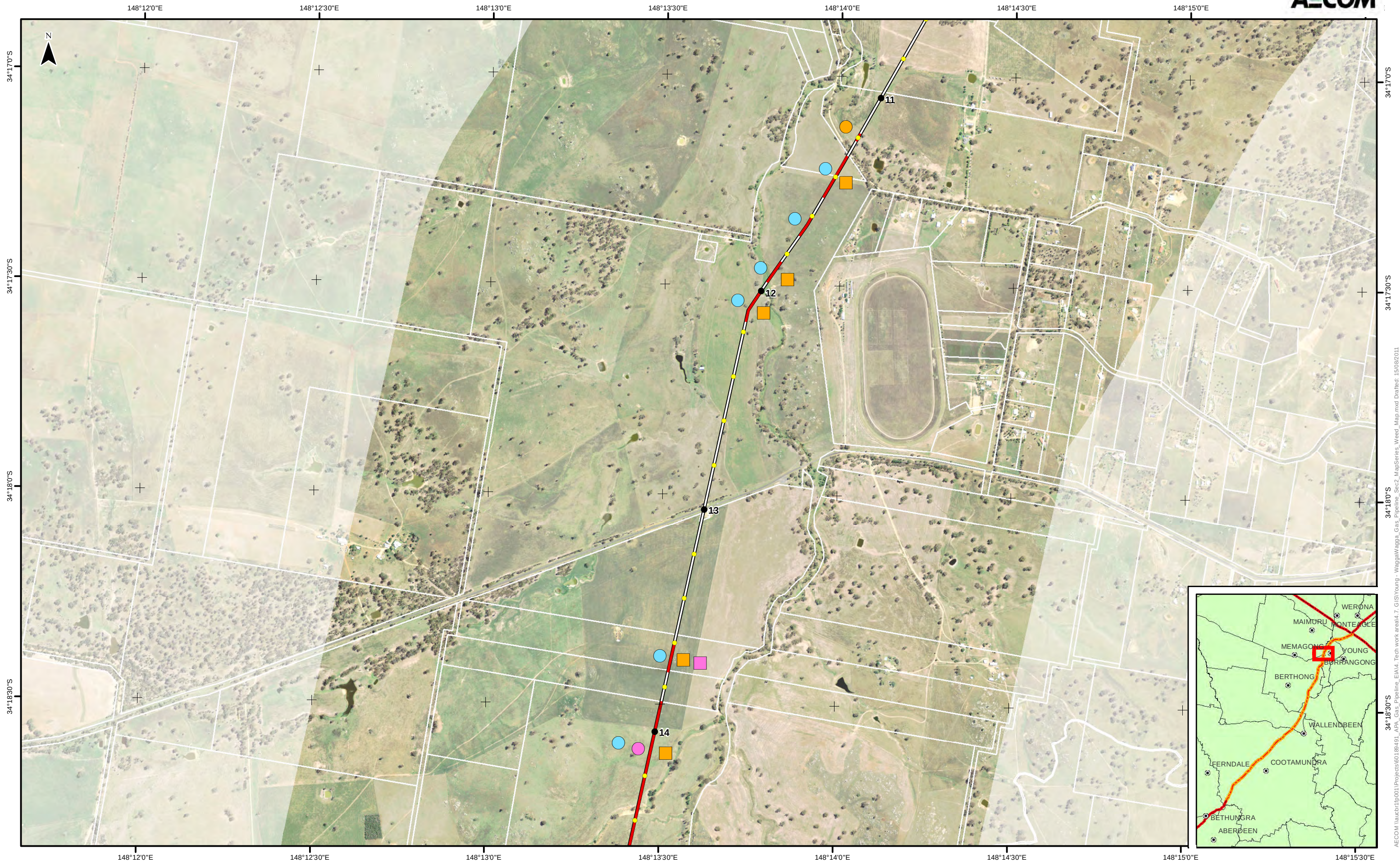
Fig. **1**

AECOM \auctb\1p001\Projects\60189491_APA_Gas_Pipeline_EIA\4. Tech work area\4.7. GIS\Young - Wagga Wagga Gas Pipeline_Sec2_MapSeries_Weed_Map.mxd Drafted: 15/09/2011



- | | | |
|------------------------|------------------|--------------------|
| Weed area | Noxious Weeds | Other Weeds |
| Gas Pipeline Section 2 | Sweet Briar | Spear Thistle |
| 1km KP marker | Scotch Thistle | Variegated Thistle |
| 200m marker | Paterson's Curse | Saffron Thistle |
| | Bathurst Burr | |

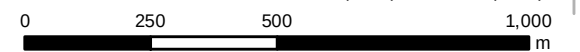
YOUNG - WAGGA WAGGA PIPELINE SECTION 2
Weeds Map
Source: LPMA (2010), StreetPro (2009)
0 250 500 1,000 m
GDA94 - MGA Zone 55



- | | | |
|--------------------------|--------------------|----------------------|
| — Weed area | Noxious Weeds | Other Weeds |
| — Gas Pipeline Section 2 | ● Sweet Briar | ■ Spear Thistle |
| ● 1km KP marker | ● Scotch Thistle | ■ Variegated Thistle |
| ● 200m marker | ● Paterson's Curse | ■ Saffron Thistle |
| | ● Bathurst Burr | |

YOUNG - WAGGA WAGGA PIPELINE SECTION 2
Weeds Map

Source: LPMA (2010), StreetPro (2009)



GDA94 - MGA Zone 55

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Fig. **3**