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Dear Fiona

## Desktop Assessment of Probable Environmental Values of the Mesa A Southern Transport Corridor

Further to your enquiry, we have prepared the following assessment of the likely biological values of the southern transport corridor option between Mesa A and Mesa J.

This assessment incorporated:

- review of the Department of Agriculture Rangelands (Land Systems) mapping for the area;
- review of digital aerial photography for the area;
- interpretation of some site-specific data from sampling of vegetation, flora and fauna along the easternmost section of the corridor, which was collected between the 27<sup>th</sup> of April and 5<sup>th</sup> of May 2005 (see Biota 2006a, 2006b); and
- review of the detailed data for the northern transport corridor options at Mesa A (Biota 2006a, 2006b), and for other survey areas in the Pannawonica locality, to provide regional context.

### 1. Land Systems and Landforms

The southern transport corridor traverses a subset of the Land Systems traversed by the northern transport corridor rail and haul road options (see Table 1, Attachment 1). There are therefore no new Land Systems present in the southern corridor compared to those surveyed by Biota (2006a, 2006b) in the northern corridor.

A number of these Land Systems are restricted in their distribution (eg. Nanutarra, Sherlock and Stuart) and/or have a relatively small area (eg. the Sherlock Land System has a total area of 38,638 ha or approximately 0.2% of the Pilbara bioregion).

Examination of digital aerial photography for the area indicates that there are no substantially different landforms within the southern transport corridor compared to the northern transport corridor. Importantly, the alignment of the southern transport corridor avoids the main Robe River.

**Table 1: Land Systems intersected by the Mesa A southern and northern transport corridors** (descriptions from Department of Agriculture 2002).

Land System	Description	Intersected by	
		Southern Transport Corridor	Northern Transport Corridor
Boolgeeda	Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands; occurs broadly through the central and easternmost sections of both the southern and northern transport corridors	√	√
Cane	Alluvial plains and flood plains supporting snakewood shrublands soft and hard spinifex grasslands and tussock grasslands; occurs only in the westernmost section of the northern transport corridor		√
Capricorn	Rugged sandstone hills and ridges; hard spinifex or stony short grass forb pasture; occurs only in the central section of the northern transport corridor		√
McKay	Hills, ridges, plateaux remnants and breakaways of metasedimentary and sedimentary rocks supporting hard spinifex grasslands; occurs only in the northern transport corridor, east of the Deepdale Road and at the easternmost end of the rail corridor		√
Nanutarra	Low mesas and hills of sedimentary rocks supporting soft and hard spinifex grasslands; occurs as a very small area in the proposed borrow pit area towards the western end of the southern transport corridor, and south of Mesa A and east of the Gas Pipeline Road in the northern transport corridor	√	√
Newman	Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands; occurs in the northern and southern transport corridors from Mesa G eastwards	√	√
River	Active flood plains and major rivers supporting grassy eucalypt woodlands, tussock grasslands and soft spinifex grasslands; occurs at various points through both the northern and southern transport corridors	√	√
Robe	Low limonite mesas and buttes supporting soft spinifex (and occasionally hard spinifex) grasslands; occurs in sections through both the northern and southern transport corridors	√	√
Sherlock	Stony alluvial plains supporting snakewood shrublands with patchy tussock grasses and spinifex grasslands; occurs in large swathes through the southern and northern transport corridors, mainly between Mesas C/D and G	√	√
Stuart	Undulating plains with snakewood; low hills with spinifex; stony chenopod and hard spinifex pastures; occurs in both the southern and northern transport corridors west of Mesas C/D	√	√
Urandy	Stony plains, alluvial plains and drainage lines supporting shrubby soft spinifex grasslands; occurs in both the southern and northern transport corridors between Mesa G and the Bungaroo Road	√	√

## 2. Vegetation

Only the westernmost and easternmost sections of the southern transport corridor have been systematically surveyed for vegetation.

Based on the mapping prepared to date, all of the vegetation types recorded from the southern transport corridor have also been recorded in the northern transport corridor. These vegetation types (see Biota 2006a for an explanation of codes) included:

- vegetation of cracking clays: CcCAoTwTe/h;
- Snakewood shrublands: AxTw/AxTe;
- shrublands over *Triodia epactia* / *T. wiseana* hummock grasslands: CcAaAbAsyTeTw, AiAaAbTw, ChAbTw, ChAbTwTe;
- shrublands over *Triodia lanigera* hummock grasslands: ChCzAtrAaTla, CcAsyCAoTla, CzAatTla;
- Snappy Gum *Eucalyptus leucophloia* over scattered shrubs and hummock grasslands on large hills and breakaways: EIAiAptTw, EIAiAbTw, EIAtuAbTwERIm;
- shrublands over hummock grasslands on low hills and hillslopes of taller hills: AiAbTw;
- vegetation of minor creeklines: CcTw, ChAsppGOrGspPISsTeTw, ChCzAtuAtrTe, ChCzAtuAtrCE, ChAtuTwTe;
- vegetation of sand sheets: CzAtGeTs.

Given that the Land Systems (based on the Department of Agriculture mapping) and the landforms (based on aerial photography) within the southern transport corridor are consistent with those in the northern transport corridor, vegetation types occurring in the remainder of the southern corridor are likely to be consistent with those previously recorded for the locality.

Unlike the northern transport corridor, the southern transport corridor does not cross the main Robe River, however there is a single crossing of a tributary of the Robe (Mungarathoona Creek, to the east of Mesa F). Given that this is the only area of major creekline habitat in the southern transport corridor, the corridor would contain only small areas of the riverine vegetation types which have been identified as being of High conservation significance (see Biota 2006a).

### 3. Flora

#### 3.1 Overall Flora

A total of 438 taxa of native vascular flora from 160 genera belonging to 57 families was recorded from the combined survey work in the northern transport corridor and the easternmost section of the southern transport corridor (Biota 2006a).

As the southern transport corridor traverses equivalent Land Systems and landforms to the northern transport corridor, It is likely that a similar suite of flora would be recorded from this area.

#### 3.2 Rare and Priority Flora

Only the westernmost and easternmost sections of the southern transport corridor have been systematically searched for flora of conservation significance.

Neither of the two Declared Rare Flora for the Pilbara were recorded:

- Mountain Thryptomene *Thryptomene wittweri* is only known from high-altitude mountain tops further east in the Pilbara, its distribution extending south into the Gascoyne and Great Victoria Desert bioregions. It has not been recorded from the Pannawonica locality to date. Given the absence of suitable habitat within the southern transport corridor, this species would not be expected to occur.
- Hamersley Lepidium *Lepidium catapycnon* is known from a number of locations further east in the Hamersley Range. Although suitable habitat (low stony hills and plains) occurs around Pannawonica, this species has not been recorded from the area to date. The closest known population is near Tom Price, some 150 km southeast. This species would not be expected to occur in the southern transport corridor.

Four Priority 3 flora have been recorded from the southern transport corridor:

- *Abutilon trudgenii* ms. and *Sida* sp. Wittenoom (W.R. Barker 1962) were both recorded numerous times, and would be expected to be widespread and abundant throughout the southern corridor;
- *Hibiscus brachysiphonius* was recorded from a single location, and could occur elsewhere in the southern corridor on clay substrates; and
- *Rhynchosia bungarensis* was recorded several times, and would be expected to occur more widely through the corridor in creekline habitat.

An additional Priority 3 species, *Phyllanthus aridus*, was recorded from a single creekline within the northern transport corridor, and could occur in similar habitat in the southern corridor.

#### 3.3 Introduced Flora (Weeds)

Only the westernmost and easternmost sections of the southern transport corridor have been systematically searched for weeds.

Four weed species – *\*Cenchrus ciliaris* (Buffel Grass), *\*C. setigerus* (Birdwood Grass), *\*Citrus colocyntis* (Colocynth) and *\*Malvastrum americanum* (Spiked Malvastrum) – have been recorded from the southern transport corridor; all of these species were also widespread within the northern transport corridor (see Biota 2006a).

Sixteen additional weed species were recorded by Biota (2006a) for the locality: *\*Acetosa vesicaria* (Ruby Dock), *\*Aerva javanica* (Kapok), *\*Argemone ochroleuca* subsp. *ochroleuca* (Mexican Poppy), *\*Bidens bipinnata* (Beggars Ticks), *\*Chloris barbata* (Purpletop Chloris), *\*Datura leichhardtii* (Native Thornapple), *\*Echinochloa colona* (Awnless Barnyard Grass), *\*Euphorbia hirta* (Asthma Plant), *\*Indigofera oblongifolia* (a pea), *\*Melochia pyramidata* (Broom-wood or Pyramid Flower), *\*Ocimum basilicum* (Basil), *\*Parkinsonia aculeata* (Parkinsonia), *\*Passiflora foetida* (Stinking Passion Flower), *\*Phoenix dactylifera* (Date Palm), *\*Sonchus oleraceus* (Common Sowthistle) and *\*Setaria verticillata* (Whorled Pigeon Grass). Parkinsonia is listed as a Declared Plant for the East Pilbara under the *Agriculture and Related Resources Protection Act 1976*. Date Palms, Buffel Grass, Birdwood Grass, Ruby Dock and Kapok are all considered to be serious environmental weeds by CALM.

With the exception of *\*Indigofera oblongifolia*, *\*Parkinsonia aculeata* and *\*Phoenix dactylifera*, all of the additional weed species recorded from the northern transport corridor would be likely to occur within the southern transport corridor.

#### 4. Fauna Habitats

Three main fauna habitats and several minor habitats were identified within the northern transport corridor based on landforms and vegetation structure:

- Drainage Lines
  - riverine habitat
  - floodplain habitat
  - minor creekline habitat
- Scree Slopes and Stony Rises:
  - low stony rise habitat
  - hillslope habitat
  - scree slope habitat
  - breakaway habitat
- Valley Floors and Plains
  - valley floor habitat
  - stony baseplain habitat
  - loamy plain habitat
  - clayey plain habitat
  - sand sheet habitat

As the southern transport corridor traverses a subset of the same Land Systems and landforms as the northern transport corridor, no additional fauna habitats would be expected to occur.

#### 5. Fauna Assemblage

The survey of the combined Mesa A northern transport corridor, the easternmost section of the southern transport corridor and Warramboe study areas recorded a total of 181 vertebrate fauna species, representing 63 families: 93 avifauna, 14 native non-volant mammals, 2 introduced mammals, 4 bats, 64 reptiles and 3 amphibians (Biota 2006b).

Given that the southern transport corridor would contain similar habitats to those present in the northern transport corridor, a similar fauna assemblage would be expected to occur. The main difference would probably be a reduced number of waterbirds, given the small amount of riverine habitat within the southern transport corridor (at Mungarathoona Creek).

##### 5.1 Rare Fauna

Five Schedule and 12 Priority listed fauna species could potentially occur in the southern transport corridor based on their distribution, although the Night Parrot *Pezoporus occidentalis* is considered highly unlikely (see Table 2). Additionally, the Northern Quoll *Dasyurus hallucatus* is listed as Endangered at the Federal level, though it is not included

under the *Wildlife Conservation (Specially Protected Fauna) Notice 2005*. These species are the same as those potentially occurring within the northern transport corridor.

**Table 2: Fauna species of conservation significance potentially occurring within the Mesa A southern transport corridor.**

Species	Conservation Status	
	State Level	Federal Level
Northern Quoll <i>Dasyurus hallucatus</i> †	None	Endangered
Orange Leaf-nosed Bat <i>Rhinonictis aurantius</i>	Schedule 1	Vulnerable
Night Parrot <i>Pezoporus occidentalis</i>	Schedule 1	Endangered
Pilbara Olive Python <i>Liasis olivaceus barroni</i>	Schedule 1	Vulnerable
Wood Sandpiper <i>Tringa glareola</i>	Schedule 3	Migratory
Peregrine Falcon <i>Falco peregrinus</i>	Schedule 4	
<i>Ramphotyphlops ganei</i>	Priority 1	
Pilbara Dragonfly <i>Antipodogomphus hodgkini</i>	Priority 2	
Pilbara Damselfly <i>Nososticta pilbara</i>	Priority 2	
Long-tailed Dunnart <i>Sminthopsis longicaudata</i>	Priority 4	
Ghost Bat <i>Macroderma gigas</i> †	Priority 4	
Lakeland Downs Mouse <i>Leggadina lakedownensis</i>	Priority 4	
Western Pebble-mound Mouse <i>Pseudomys chapmani</i> †	Priority 4	
Star Finch (western) <i>Neochmia ruficauda subclarescens</i> †	Priority 4	
Australian Bustard <i>Ardeotis australis</i> †	Priority 4	
Bush Stone-curlew <i>Burhinus grallarius</i> †	Priority 4	
Fortescue Grunter <i>Leiopotherapon aheneus</i>	Priority 4	
<i>Notoscincus butleri</i> †	Priority 4	

**NB.** † indicates species recorded during survey of the combined area of the Mesa A northern transport corridor, easternmost section of the southern transport corridor, and Warrambo deposit (Biota 2006b).

## 5.2 Short Range Endemics

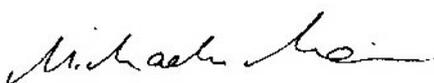
Potential short range endemics from three major groups (terrestrial snails, millipedes and trapdoor spiders) were recorded from the northern transport corridor and are likely to also occur in the southern transport corridor.

## 6. Summary

In summary, on the basis of available information (including site-specific sampling of the westernmost and easternmost sections of the corridor), the Mesa A southern transport corridor is likely to contain a subset of the environmental characteristics identified for the northern transport corridor (see Biota 2006a, 2006b). No substantially different vegetation types, fauna habitats, or flora and fauna assemblages would be expected to occur, although this would need to be confirmed via a field survey. Priority areas for survey would comprise the sections of the corridor traversing the Stuart and Sherlock Land Systems (from Mesa A to east of Mesa F) and Mungarathoona Creek.

Yours sincerely,

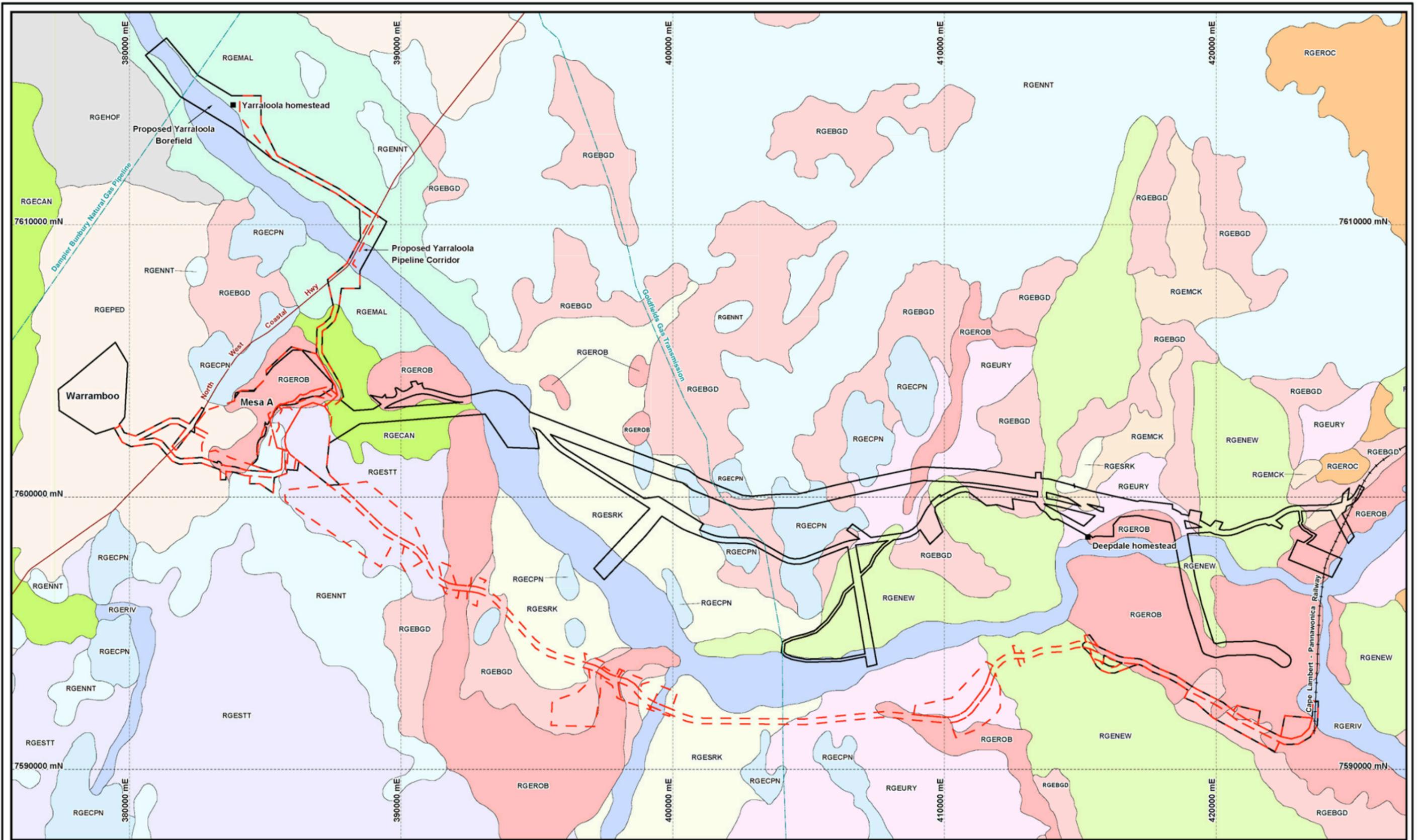
## Biota Environmental Sciences Pty Ltd



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## References

- Biota Environmental Sciences (2006a). A Vegetation and Flora Survey of the Proposed Mesa A Transport Corridor, Warrambo Deposit and Yarraloola Borefield. Unpublished report for Robe River Iron Associates, January 2006.
- Biota Environmental Sciences (2006b). Fauna Habitats and Fauna Assemblage of the Mesa A Transport Corridor and Warrambo. Unpublished report for Robe River Iron Associates, January 2006.



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