



**Fairview Ecological
Assessment Report – Lots 1
AB73, 1 AB247, 2 AB247 & 46
FTY1813
Santos Ltd**


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Flora species list

1. Background

1.1 Project description

Santos Ltd (Santos) have commissioned Aurecon Australia Pty Ltd (Aurecon) to undertake ecological investigations of proposed areas of development for the expansion of the Fairview Gas Fields.

The Fairview gas fields are situated approximately 40km from Injune in southern Queensland. This area is characterised by elevated sandstone ranges including the Carnarvon and Expedition Ranges and part of the Mount Hutton and Kongabula Ranges. The Dawson River and other smaller watercourses drain this area and the vegetation is dominated by Eucalyptus and White Cypress Pine woodland, Brigalow and Semi-evergreen Vine Thicket (Eddie, 2007).

Lots 1 AB73, 1 AB247, 2 AB247 and 46 FYT1813 contains large areas of historically cleared land and much of this area has been subjected to cattle grazing and other agricultural practices as well as previous development associated with the gas fields. There are areas of remnant vegetation present especially in riparian area around the Hutton River.

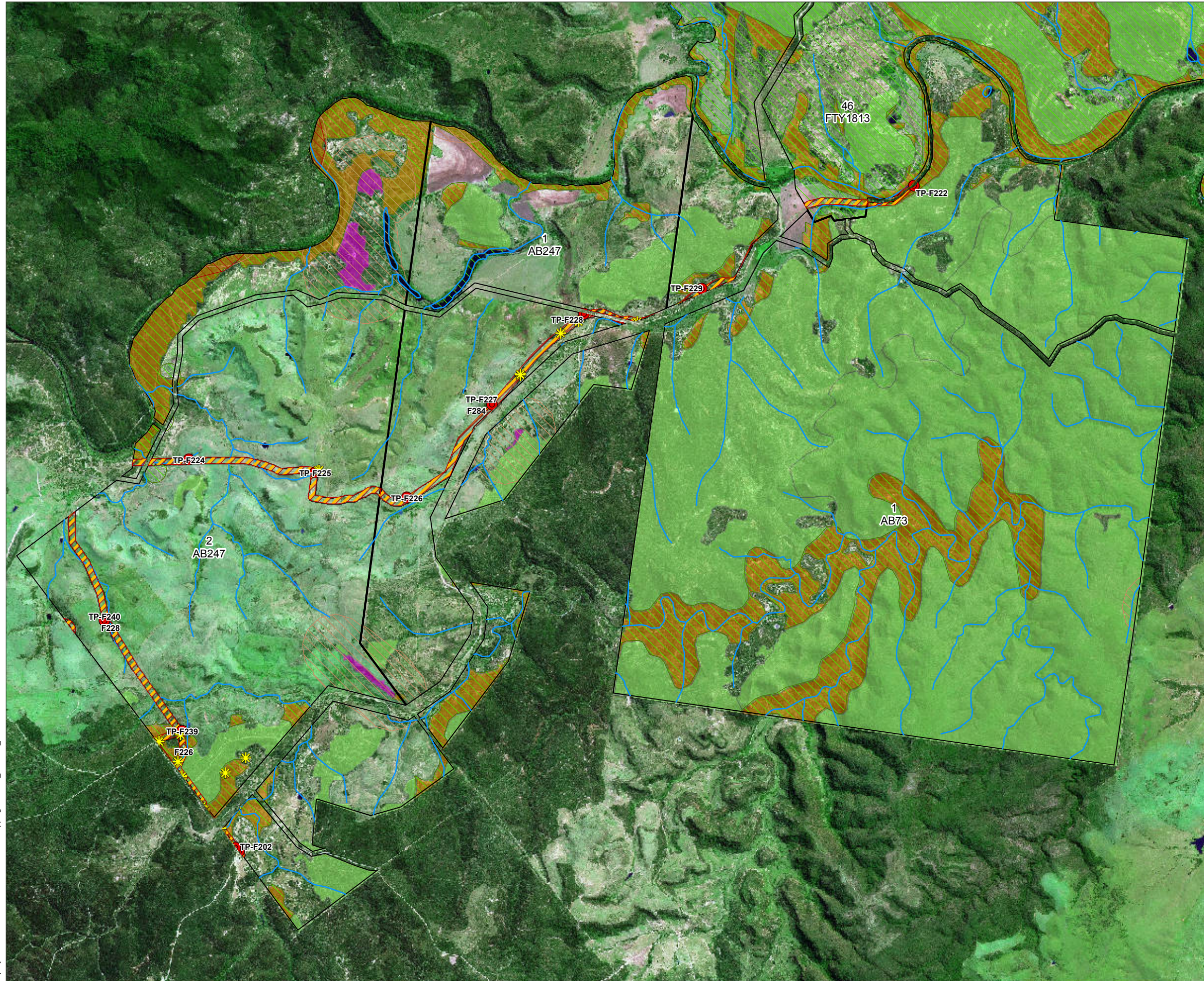
This report is specific to the proposed development areas listed below and shown in Figure 1-1 and Figure 1-2:

- Pipeline corridors F226, F227, F228 and F284 and 6339-RM-59
- Geotechnical survey locations situated within the above corridors and shown in Figure 1-1

These areas are collectively referred to as the 'proposed development area', and are located within Lot 1 AB73, 1 AB247, 2 AB247 and 46 FYT1813.

1.2 Purpose of report

The aim of this report is to provide an ecological assessment of the proposed development areas located on Lots 1 AB73, 1 AB247, 2 AB247 and 46 FTY1813 (Figure 1-1), and to identify areas and species of notable ecological or conservation value. This report does not make any recommendations regarding the development in relation to any Santos environmental authorities or other approvals.



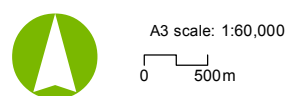
Legend

- Notable Species
- Geotech Borehole Locations
- Ground Truthed Areas
- Drainage (100K)
- ESA Category A
- ESA Category B
- ESA Category C
- Regional Ecosystem Mapping**
- Non-remnant / regrowth
- Endangered - Sub-dominant
- Endangered - Dominant
- Of Concern - Sub-dominant
- Of Concern - Dominant
- Not Of Concern
- Plantation forest
- Water

Notes:

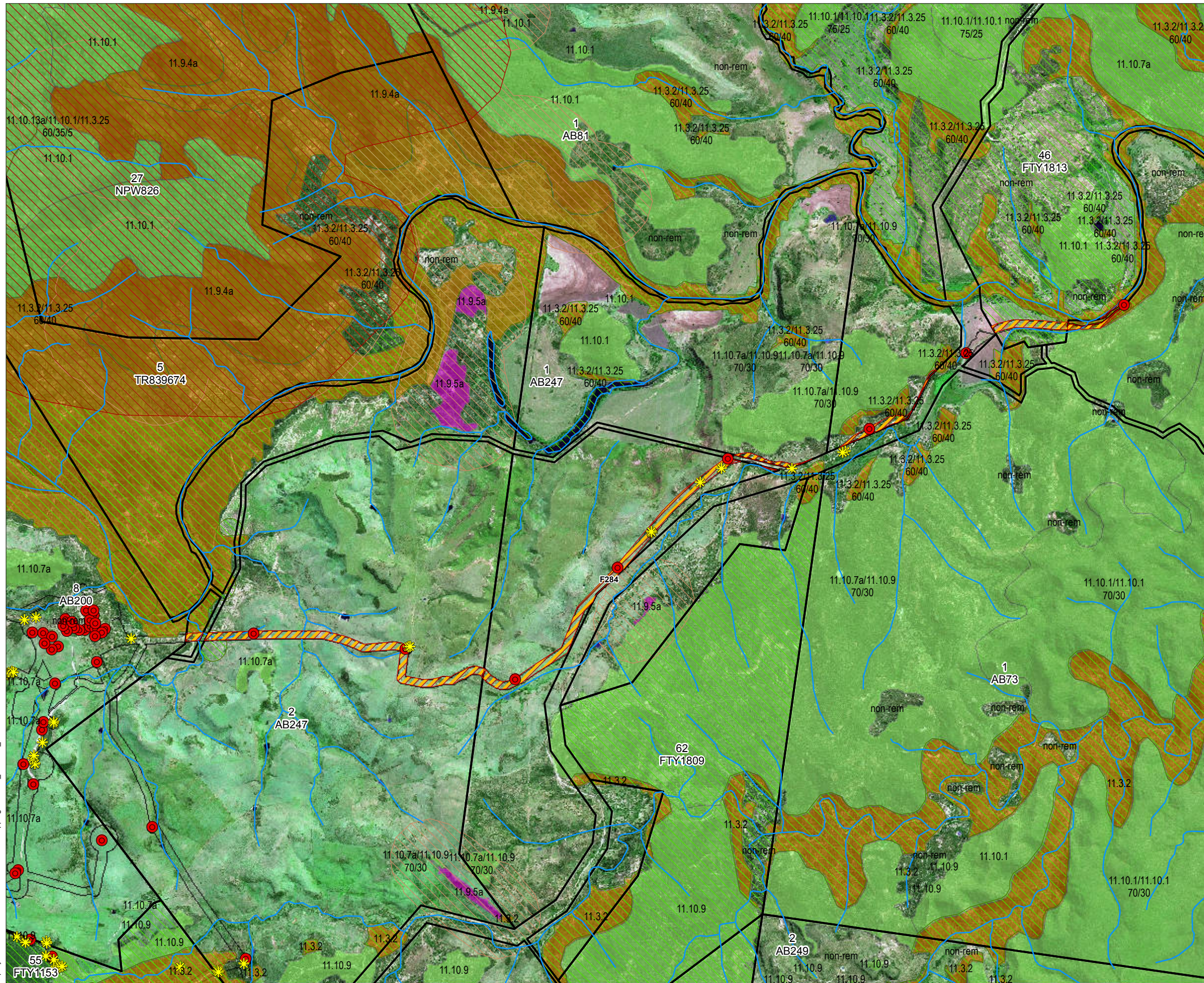
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 Coordinate system: GDA 1994 MGA Zone 55

Santos Lots 2AB247, 1AB73, 1AB247 and 46FTY1813



Legend

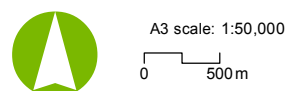
- Notable Species
 - Geotech Borehole Locations
 - Corridor F284
 - Drainage (100K)
 - ESA Category A
 - ESA Category B
 - ESA Category C
- Regional Ecosystem Mapping**
- Non-remnant / regrowth
 - Endangered - Sub-dominant
 - Endangered - Dominant
 - Of Concern - Sub-dominant
 - Of Concern - Dominant
 - Not Of Concern
 - Plantation forest
 - Water

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Coordinate system: GDA 1994 MGA Zone 55

2. Methodology

2.1 Desktop methodology

Proposed development areas have been projected on a range of maps provided by Santos. These maps include Regional Ecosystem (RE) Mapping (version 6.0; Department of Environment and Resource Management [DERM]), Environmentally Sensitive Areas (ESA) mapping, drainage mapping and aerial photography. Where available ahead of time, these resources were reviewed to determine target areas for the field inspection. It is important to note that the RE classifications used in this report are based on the 'biodiversity status' of the vegetation and not the '*Vegetation Management Act 1999* (VM Act) status' of the vegetation.

2.2 Field methodology

The proposed development areas were assessed by five (5) Aurecon ecologists (Grant Paterson, Hayley Poole, Luke Foster, Samara Schulz and Vanessa Boettcher) on the 21 June 2011. These assessments were to determine the existing vegetation communities and habitat value of the proposed clearing within the development areas as well as to verify the RE mapping as produced by DERM.

GIS environmental constraints layers (eg RE Mapping, ESA mapping etc) and high resolution aerial photography were uploaded onto a toughbook (C5 mobile clinical assistant CFT-001 – Motion computing), with an integrated GPS used to locate surveys areas. Handheld Garmin GPS units (GPS map 76) were also used during the field investigations. It should be noted that while efforts were made to ensure the GPS co-ordinates provided in this report are accurate, a margin of error approximately +/- 15 m is expected due to the limitations of the devices used and the recording environment.

The corridors were 100m wide and of varying lengths, and geotechnical survey locations were also assessed as part of the survey areas and had a radius of 70 m

The ground-truthing of the proposed development areas included undertaking detailed flora species surveys including sampling of unknown flora, and recording all incidental fauna observations. All species known to be of conservation significance (such as endangered, vulnerable, near threatened or Type A species under the *Nature Conservation Act 1992* [NC Act] or endangered, vulnerable or rare species under the *Environment Protection and Biodiversity Conservation Act 1999* [EPBC Act]) were recorded using the toughbook.

A list of flora species observed in the proposed development areas has been included in Appendix A. Incidental fauna observations are provided in the relevant sections throughout this report.

3. Ecological assessment

3.1 F205

General

Only a small section of the corridor F205 occurs within Lot 2 AB247 (Figure 3-1). This corridor is not discussed in this report as it was covered in the Lot 8 AB200 report, submitted 17 June 2011.

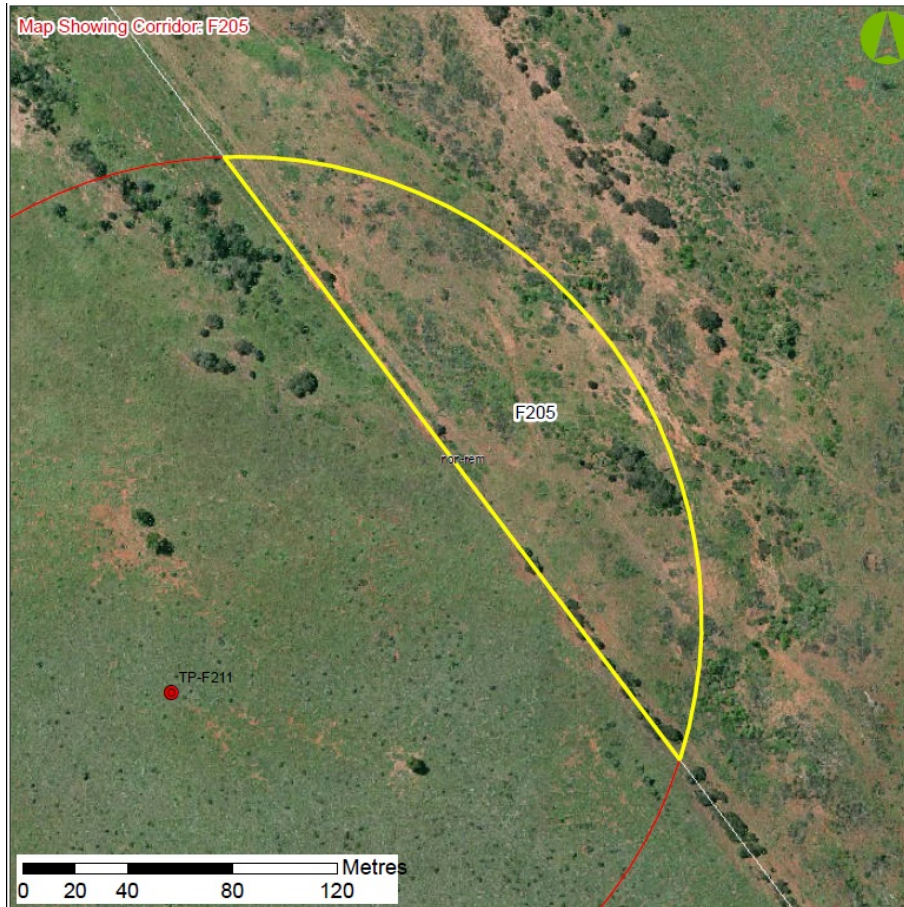


Figure 3-1 Aerial photograph and associated RE mapping of proposed corridor F205

3.2 F225

General

Corridor F225 is located on the western boundary of Lot 2 AB247 and part of the corridor is located within Lot 55 FTY1153 as the corridor runs along the boundary of the two lots. Geo-tech sites 6399-RM-59 and TP-F202 are attached to the corridor and will also be assessed within this section of this report.

The proposed disturbance area within corridor F225 occurs across areas mapped at non-remnant and RE 11.3.2 which is 'of concern' vegetation. These areas are therefore classed as a 'Category C' Environmentally Sensitive Area (ESA). The non-remnant mapping was confirmed while the 11.3.2 mapping was not confirmed and is discussed further below.

There is an access track at the southern section of F225 and the corridor intersects a watercourse (classified by DERM as stream order 2). Figure 3-2 shows the proposed corridor F225.

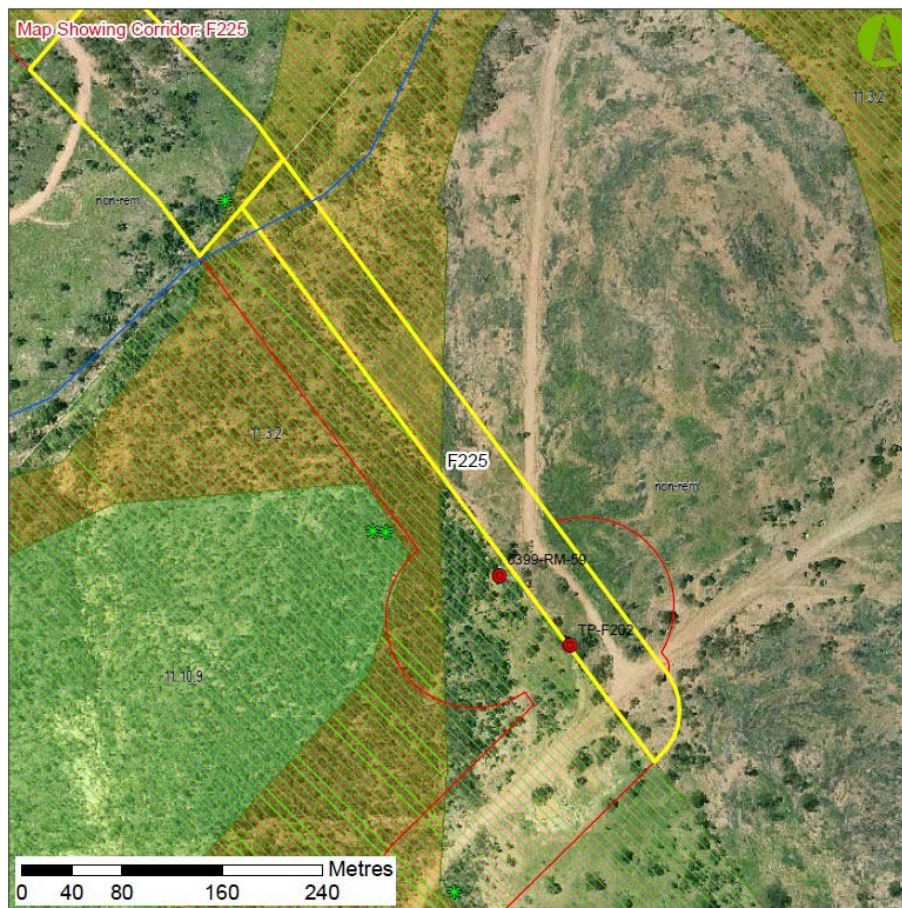


Figure 3-2 Aerial photograph and associated RE mapping of proposed corridor F225

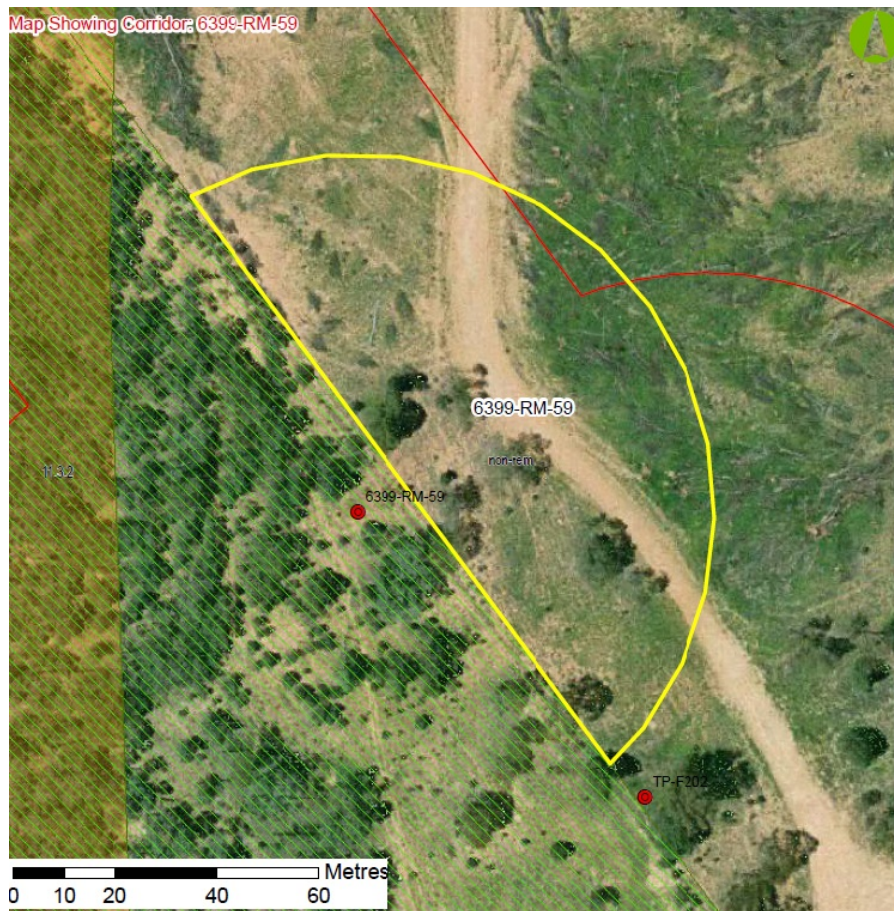


Figure 3-3 Aerial photograph and associated RE mapping of proposed geo-tech 6399-RM-59

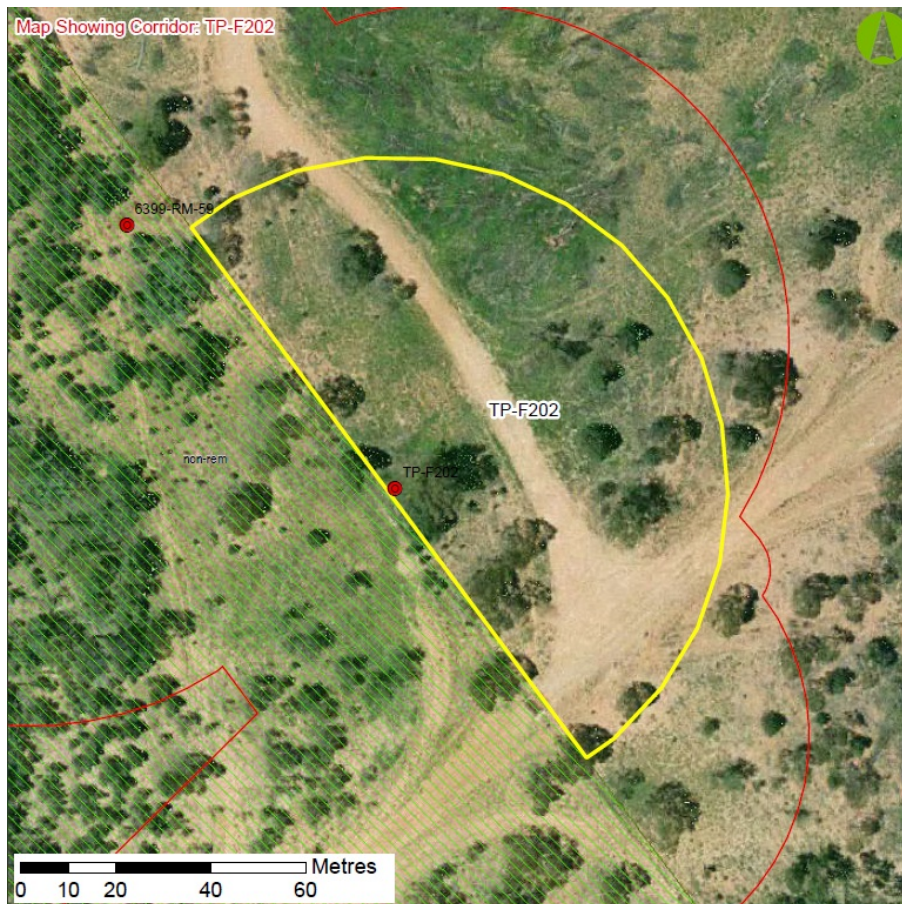


Figure 3-4 Aerial photograph and associated RE mapping of proposed geo-tech TP-F202

Floristics

The vegetation that occurs within corridors F225 is a White Cypress Pine Woodland. The dominant canopy species are *Callitris glaucophylla* (White Cypress Pine) with some *Eucalyptus melanophloia* (Silver Leaved Ironbark) and *Eucalyptus populnea* (Poplar Box). The mid-stratum and shrub layers was sparse due to dense stands of *C. glaucophylla*, the predominant species were Acacias (*Acacia complanata*, *Acacia excelsa* and *Acacia leiocalyx*). The groundcover consisted of a dense native grass layer with a range of native herbs also present. Weed species were more prominent in the non-remnant areas, such as *Opuntia stricta* (Prickly Pear) and *Pennisetum ciliare* (Buffel).

The RE 11.3.2 is described as *Eucalyptus populnea* woodland on alluvial plains, and was not present in the area mapped as *E. populnea* was not the dominant canopy species and the geology was sandstone ranges not alluvial plains. This vegetation described above occurs across all corridors and geo-tech sites and is consistent with RE mapping 11.10.9. It is suggested that the area within corridor F225 that is mapped as RE 11.3.2 should be a continuation of 11.10.9.

Habitat values

The habitat value of corridor F225 was identified as moderate due to the presence of a mixture of remnant and non-remnant vegetation. The vegetation consisted of mature trees and had a relatively complex structure (T1, T2, and dense grassy ground cover). Weed species were present in abundance in the grassy areas. Fallen timber and woody debris was identified as potential habitat for reptiles and other terrestrial species. The creek line adds to the habitat potential of the corridor as it is suitable habitat for amphibian species.

3.3 Corridor F226

General

Corridor F226 is located on the western boundary of Lot 2 AB247 and part of the corridor is located within Lot 55 FTY1153 as the corridor runs along the boundary of the two lots. The Northern third of corridor (ca. 500 m) is located within Lot 2 AB247. The corridor does not include any geo-tech sites.

The proposed disturbance area within corridor F226 occurs predominantly within an area mapped as RE 11.10.9 which is 'least concern' vegetation. Small sections of the corridor in the north and south occur partially within vegetation mapped as RE 11.3.2, which is 'of concern' and is therefore classed as a 'Category C' Environmentally Sensitive Area (ESA). There is also a small section of non-remnant vegetation in the northern section of the disturbance area. The non-remnant and 11.10.9 mapping were confirmed during the recent field surveys (June), while the 11.3.2 mapping was found to be incorrect and is discussed further below.

Within the section of the corridor that follows the lot boundary there is a large access track, the corridor also bisects and follows a watercourse in the north of the disturbance area (classified by DERM as stream order 1). Figure 3-5 shows the proposed corridor F226.

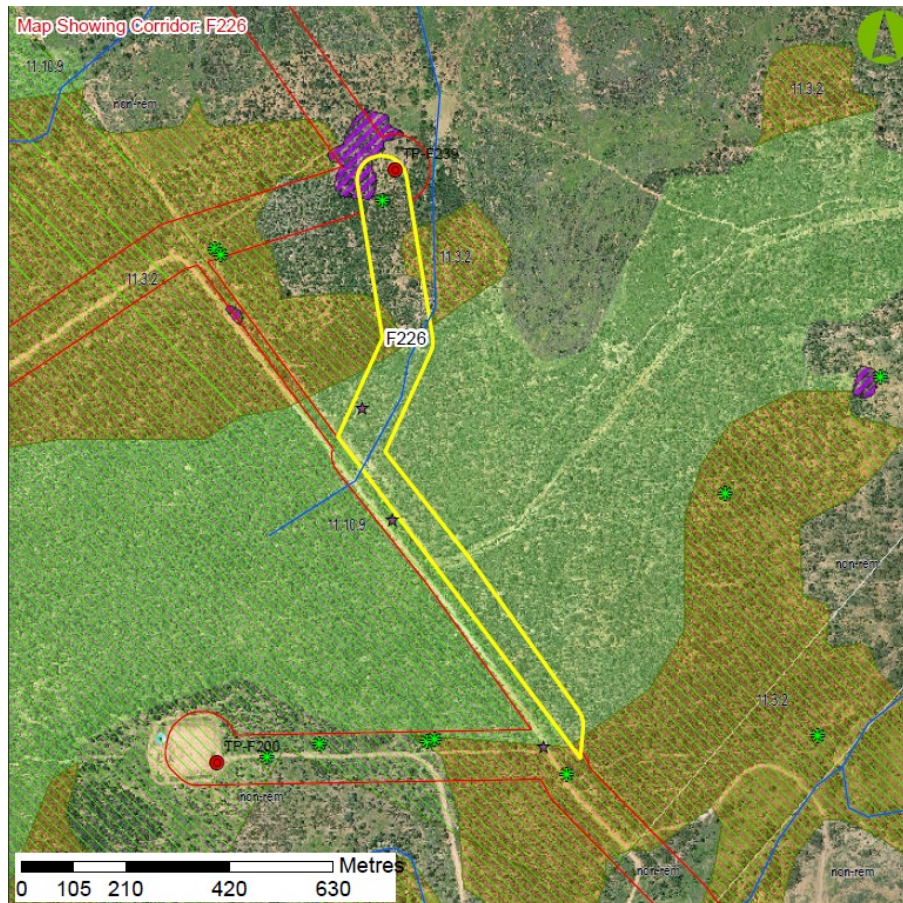


Figure 3-5 Aerial photograph and associated RE mapping of proposed corridor F226

Floristics

The proposed disturbance area is densely vegetated with a White Cypress Woodland / Eucalypt forest. The canopy is dominated by *Callitris glaucophylla* (White Cypress) with *Eucalyptus populnea*

(Poplar Box) and *Eucalyptus melanophloia* (Silver Leaved Ironbark) as the dominant eucalypt species. The mid-storey is sparsely vegetated with woody shrubs including *Eremophila mitchellii* (False Sandalwood) and *Acacia leiocalyx* (Black Wattle). *Acacia excelsa* (Iron Wood) is the dominant shrub species at the southern end of the corridor. Ground cover is dominated by native grasses and herbs such as *Themeda triandra* (Kangaroo Grass), *Cymbopogon refractus* (Barbed Wire Grass) and *Cheilanthes sieberi* (Mulga Fern). Weed species such as *Pennisetum ciliare* (Buffel Grass) and *Opuntia tomentosa* (Velvety Tree Pear). Plate 3-1 below shows an example of typical vegetation found within the corridor.



Plate 3-1 Site photograph of corridor F226 showing typical vegetation type (White Cypress / Eucalypt woodland)

A small area of the corridor occurs within an area mapped as RE 11.3.2 which is described as *Eucalyptus populnea* woodland on alluvial plains. The vegetation described above was found along the majority of the corridor and while the vegetation may fit into RE 11.3.2 the land zone of the area is better suited to Landzone 10; sandstone ranges.

Floristic variation within the site occurred due to changes in topography. A creek line was identified within which, *Angophora floribunda* (Rough Barked Apple) was the dominant overstorey species. *Eleocharis* (Spike Rush) and *Juncus usitatus* (Juncus) also occurred within the creek (Plate 3-2).



Plate 3-2 Site photograph of corridor F226 showing creek line with *Angophora floribunda*

One Type A restricted plant species was observed in the proposed corridor, *Cymbidium canaliculatum* (Black Orchid), the locations of the plant is shown in Table 3-1.

Table 3-1 Location of Type A Restricted Plants (*Nature Conservation Act 1992*)

Species	Easting (GDA 94, Zone 55J)	Northing (GDA 94, Zone 55J)
<i>Cymbidium canaliculatum</i>	711438	7147873

No other species of conservation significance under the EPBC Act or NC Act were present. A species list is provided in Appendix A.

Habitat values

The habitat value of corridor F226 was identified as high due to the presence of extensive remnant vegetation. The vegetation consisted of mature trees and had a relatively complex structure (T1, T2, and dense grassy ground cover). Weed species were present but in low abundance. The corridor also contained dead stags and tree hollows that were identified as potential habitat for arboreal mammals and foraging/nesting birds. Fallen timber and woody debris was identified as potential habitat for reptiles and other terrestrial species. The creek line adds to the habitat potential of the corridor as it is suitable habitat for amphibian species.

Common local fauna species such as Apostle Birds (*Struthidea cinerea*) were observed in the area. No fauna species of conservation significance under the EPBC Act or NC Act were observed.

3.4 Corridor F227

General

Corridor occurs predominantly within Lot 55 FTY1153, approximately 500 m of the corridor occurs within Lot 2 AB247 and this section of the corridor will be assessed in this section of this report. Geotech TP-F239 is associated with corridor F227 and will also be covered in this assessment.

The proposed disturbance area is mapped as non-remnant and RE 11.3.2 'of concern' vegetation, which is there a 'Category C' Environmentally Sensitive Area (ESA). The RE mapping of 11.3.2 was not confirmed during recent surveys in June, this is discussed further below.

An access track is present in a small portion of the corridor and the corridor boundary for TP-F239 just encroaches on a 1st order stream. Figure 3-6 illustrates the proposed disturbance area of F227.

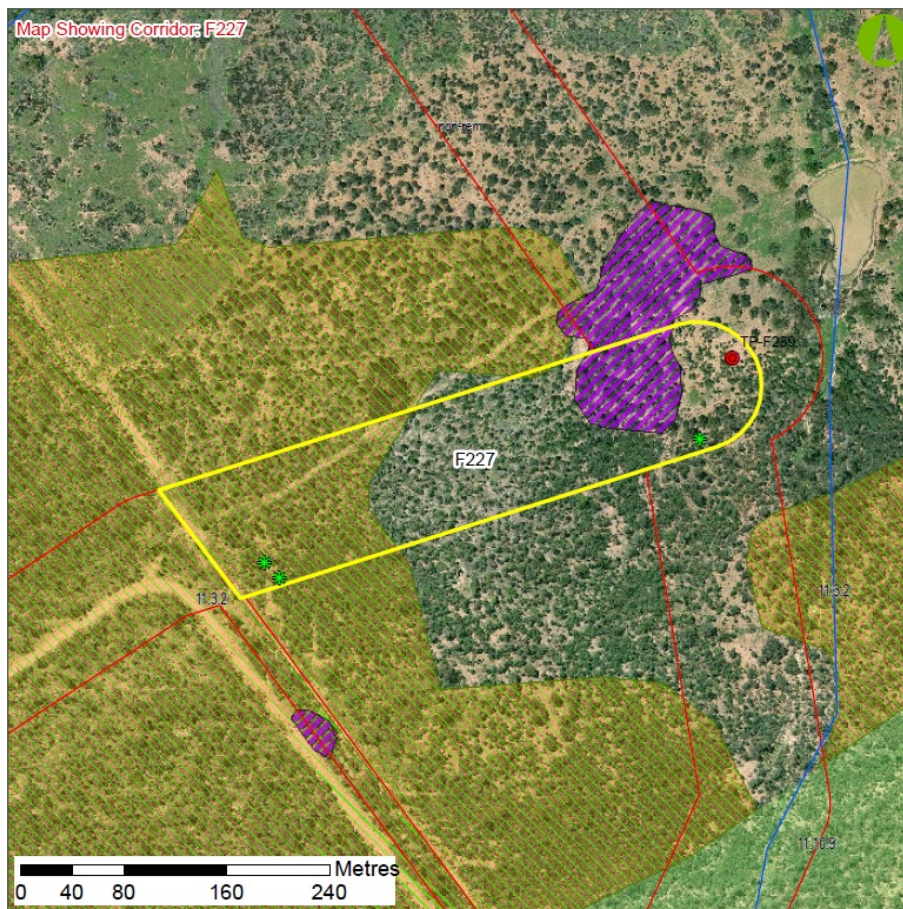


Figure 3-6 Aerial photograph and associated RE mapping of proposed corridor F227

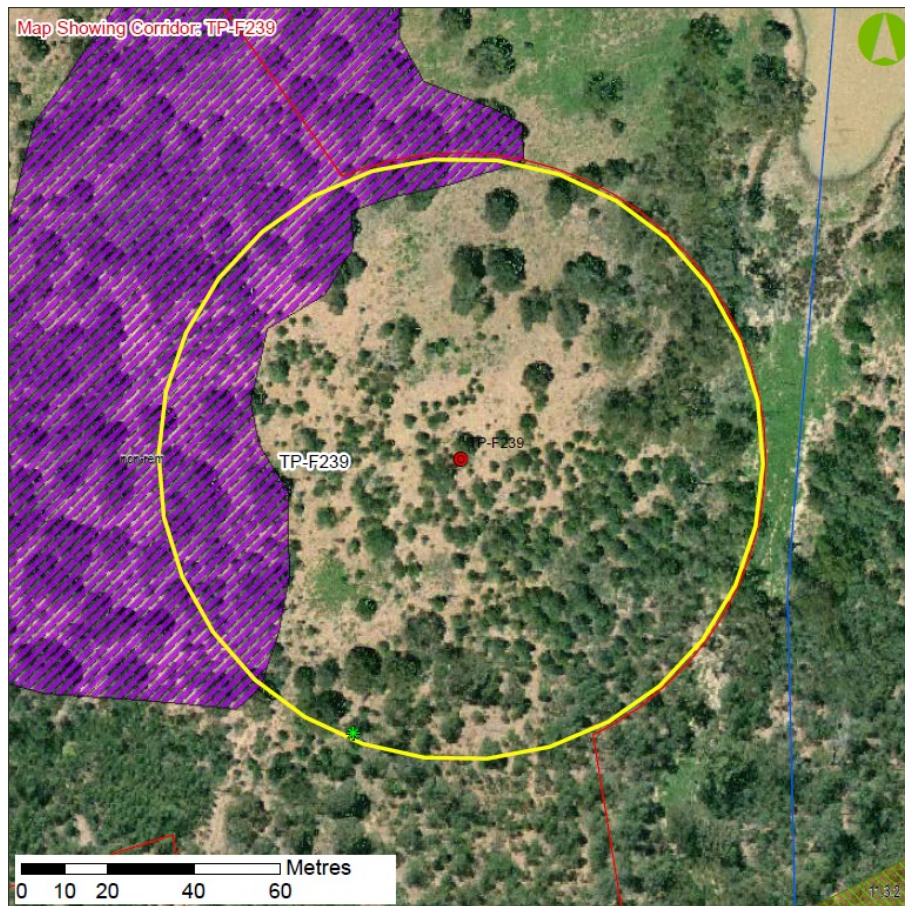


Figure 3-7 Aerial photograph and associated RE mapping of proposed geo-tech site TP-F239

Floristics

The vegetation in the proposed disturbance area was fairly uniform despite the different RE mappings in the area. The proposed disturbance area is vegetated with a White Cypress / Eucalypt Woodland. The canopy stratum was dominated by *Callitris glaucophylla* (White Cypress), *Eucalyptus populnea* (Poplar box) and *Eucalyptus melanophloia* (Silver Leaved Ironbark). The mid-story and shrub layer was predominantly made up of *Acacia leiocalyx* (Black Wattle), *Acacia harpophylla* (Brigalow) and *Carissa ovate* (Currant Bush). The groundcover was a dense native grass layer dominated by *Themeda triandra* (Kangaroo Grass), *Aristida caput medusa* (Curly Head Wire Grass) and *Wahlenbergia gracilis* (Sprawling Bluebells).

The 'of concern' RE mapping in the disturbance area has vegetation that would fit into the description of 11.3.2 *Eucalyptus populnea* woodland on alluvial plains, but the land zone in the corridor area does not an alluvial plain and would be better mapped as land zone 10.

One Type A restricted species was found within corridor F227 and the associated geo-tech. The species found was *Brachychiton populneus* and the locations of the 2 plants are listed in Table 3-2.

Table 3-2 Location of Type A Restricted Plants (*Nature Conservation Act 1992*)

Species	Easting (GDA 94, Zone 55J)	Northing (GDA 94, Zone 55J)
<i>Brachychiton populneus</i>	711140	7148194
<i>Brachychiton populneus</i>	711152	7148182
<i>Brachychiton populneus</i>	711479	7148290

There is an area within the corridor dominated by *Acacia harpophylla* (Brigalow), within this densely vegetated area the system changes to a sparse ground cover and shrub species that are shade tolerant. *Acacia harpophylla* (Brigalow) which is listed under the EPBC Act was recorded within the corridor. Table 3-3 shows the location of this remnant.

Table 3-3 Location of EVNT listed species under the EPBC Act

Species	Easting (GDA 94, Zone 55J)	Northing (GDA 94, Zone 55J)
<i>Acacia harpophylla</i>	711407	7148313

No other species of conservation significance under the EPBC Act or NC Act were present. A species list is provided in Appendix A.

Habitat values

The overall habitat value of the corridor is considered to be high due to the presence of remnant vegetation which contains different strata, canopy, mid, shrub and ground layers and therefore provides structural complexity and floristic diversity. The proposed disturbance area contained standing and fallen dead wood, tree hollows, fissured tree bark and leaf litter which provides potential habitat for reptiles, terrestrial and arboreal mammals, and bird species. Weed species were present in the area but were in low abundance.

Bird calls were heard during the survey but no species of conservation significance under the EPBC Act or NC Act were observed.

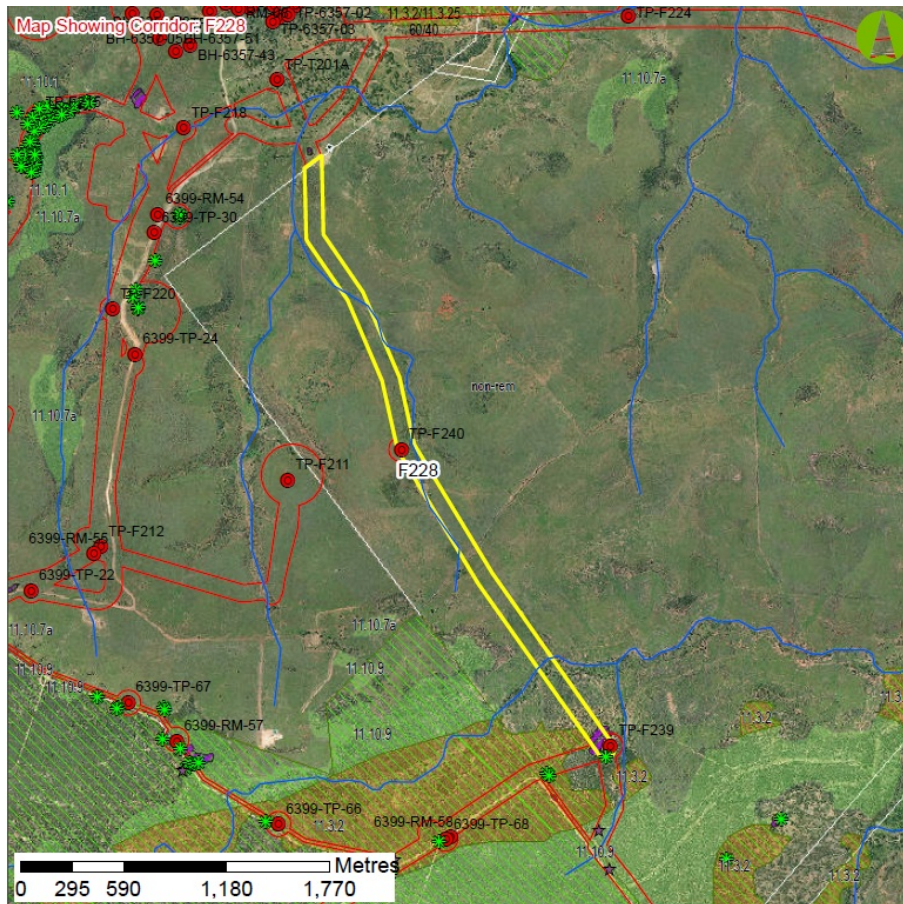
3.5 Corridor F228

General

Corridor F228 runs north-south on the western side of Lot 2 AB247. This section of this report will also include geo-tech TP-F240 as the proposed disturbance area is within and connected to corridor F228.

Corridor F228 is predominantly located within an area mapped as non-remnant, there is a small section in the southern part of the corridor mapped as RE 11.3.2, which is classed as 'of concern' and is therefore a 'Category C' Environmentally Sensitive Area (ESA). Field investigations in June confirmed the non-remnant areas while the mapping of 11.3.2 was found to be incorrect, this is discussed further below.

The corridor occurs predominantly within an area of cleared pasture with some standing vegetation and does not contain any major roads or access tracks. There are two streams that corridor F228 bisects. A 1st order stream in the north of the lot is bisected twice by the corridor, and a 2nd order stream in the south of the lot is bisected once by the corridor. Figure 3-8 below illustrates corridor F228.



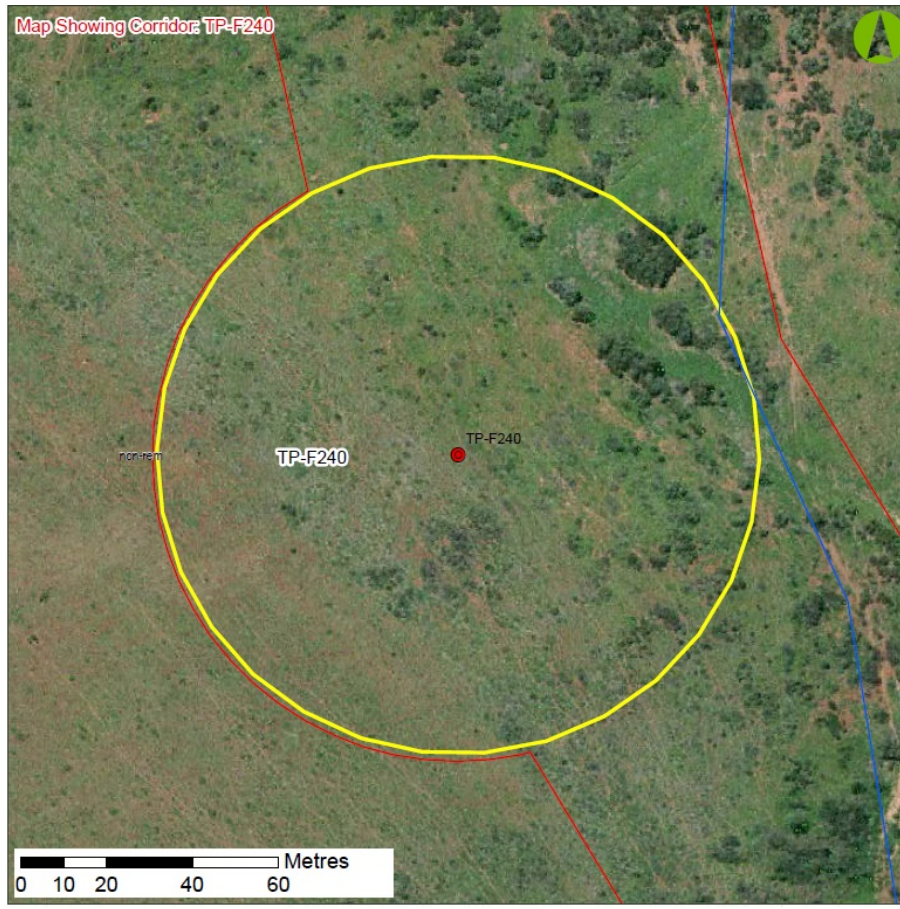


Figure 3-8 Aerial photograph and associated RE mapping of proposed geo-tech TP-F240

Floristics

The southern area of the corridor is mapped as RE11.3.2 which is described as *Eucalyptus populnea* on alluvial plains. The RE mapping was deemed to be incorrect as the area was not an alluvial plain, instead the area was on coarse sedimentary rocks and had a slight northern slope which is better fitted to land zone 10. The vegetation in the areas was dominated by *Callitris glaucophylla* (White Cypress Pine) with some *Eucalyptus populnea* (Poplar Box) in the canopy layer. The middle story and shrub layers were dominated by *Eremophila mitchellii* (False Sandalwood) and *Geijera parviflora* (Wilga), and the groundcover was patchy native and introduced grasses.

The majority of the corridor has been cleared and is dominated by *Pennisetum ciliare* (Buffel Grass) with some native grasses, *Heteropogon contortus* (Black Spear Grass) and *Themeda quadrivalvis* (Grader Grass). Some trees and shrubs are present throughout the corridor but are scattered and there is not a defined structure to the vegetation.

No species of conservation significance under EPBC or NC Act were present on corridor F228

Habitat values

The habitat value overall for the corridor is low as the corridor predominantly occurs within in an area of cleared land dominated by exotic pastures. The area has isolated mature trees and scattered areas of isolated shrubby regrowth, small amounts of woody debris, and minimal litter and rocky areas. These vegetation features indicate there is limit area suitable to support a diverse range of native fauna. Part of the disturbance area is within remnant vegetation that has higher habitat value, but this

area is minimal in respect to the entire corridor. Some bird calls were heard in areas of shrubby regrowth during the site visit.

No fauna species of conservation significance under the NC Act or the EPBC Act were observed within the proposed corridor.

3.6 Corridor F284

General

Corridor F284 is the easternmost proposed corridor within the Fairview proposed development plan. The corridor is approximately 16 km in length and traverses through (From west to east), lot 8 (AB200), lot 2 (AB247), lot 1 (AB247), lot 1 (AB73), lot 46 (FTY1813) and the Injune Road easement corridor.

There are several geotech sites located within corridor F284, these include, TP-F224, TP-F225, TP-F226, TP-F227, TP-F228, TP-F229, TP-F230, and TP-F222.

The majority of the corridor has been historically cleared for agricultural purposes. At the time of surveys, grazing was evident throughout the area. Injune Road traverses the last 5 km of the corridor heading east to Baroondah. Several smaller access tracks traverse small sections of the western end of the corridor.

Remnant vegetation exists within the corridor, particularly at the eastern end along the Hudson River. RE mapping classifies the existing vegetation as RE11.10.7a/11.10.9, RE11.3.2/11.3.25 and non-remnant which are listed as 'no concern at present', 'of concern – dominant' and 'of no concern' respectively. Surveys found that the RE vegetation mapping was correct.

RE 11.3.2/11.3.25 (*Eucalyptus populnea* woodland) is an 'of concern' regional ecosystem which falls within the proposed corridor in several places. This means that these areas are classified as 'Category C' Environmentally Sensitive Areas (ESAs).

The Hutton River (stream order 6) intersects the proposed corridor at the eastern end of the corridor. Several small gullies that in times of heavy rain potentially may flow also intersect the proposed corridor in several places. These were dry at the time of surveys.

Cultivation is present within the eastern end of the proposed corridor. Figures Figure 3-9 to Figure 3-19 below illustrates the proposed corridor.

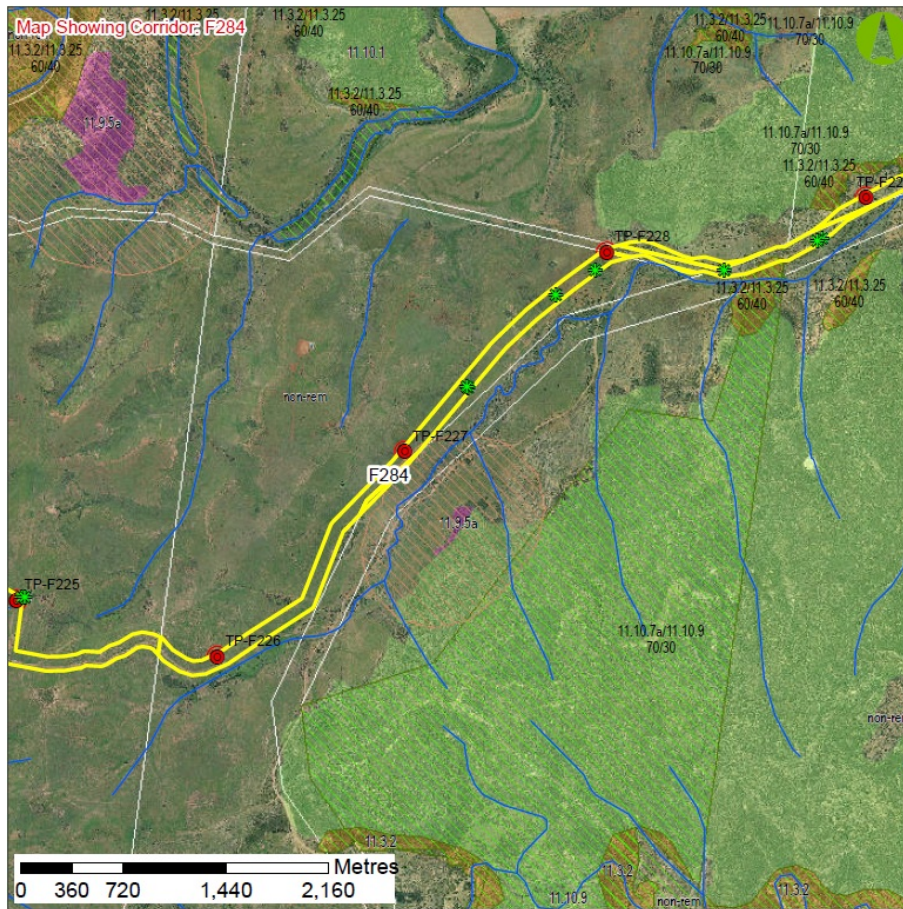


Figure 3-9 Aerial photograph and associated RE mapping of proposed corridor 284

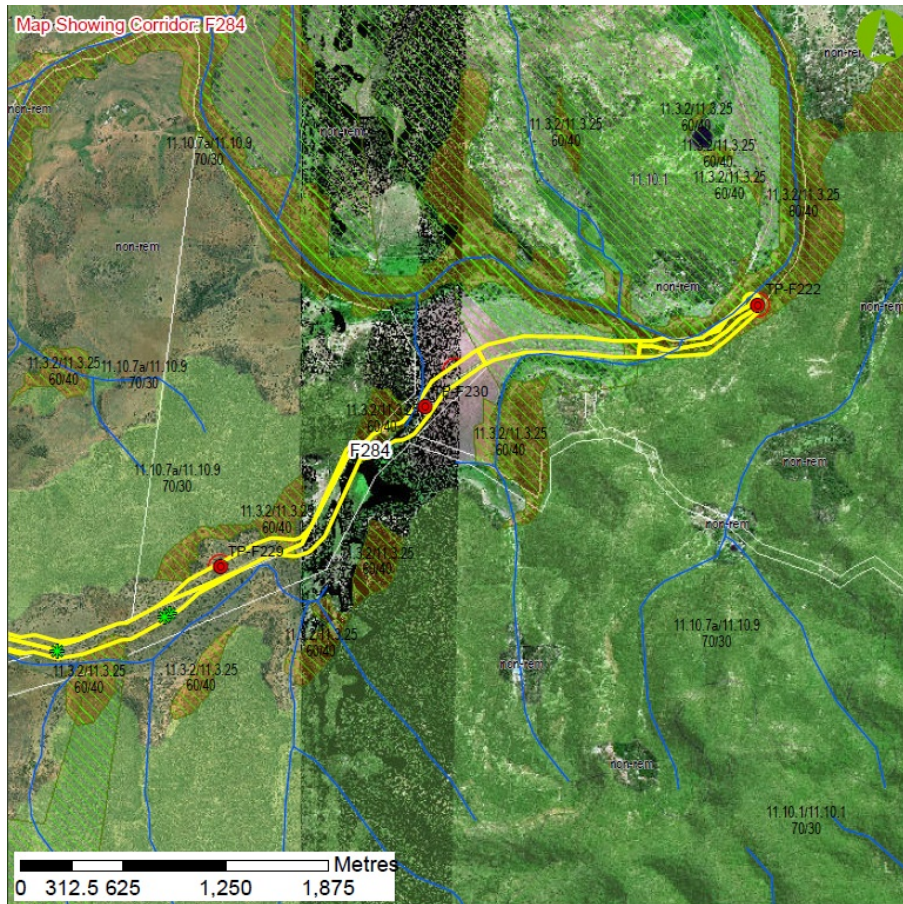


Figure 3-10 Aerial photograph and associated RE mapping of proposed corridor 284

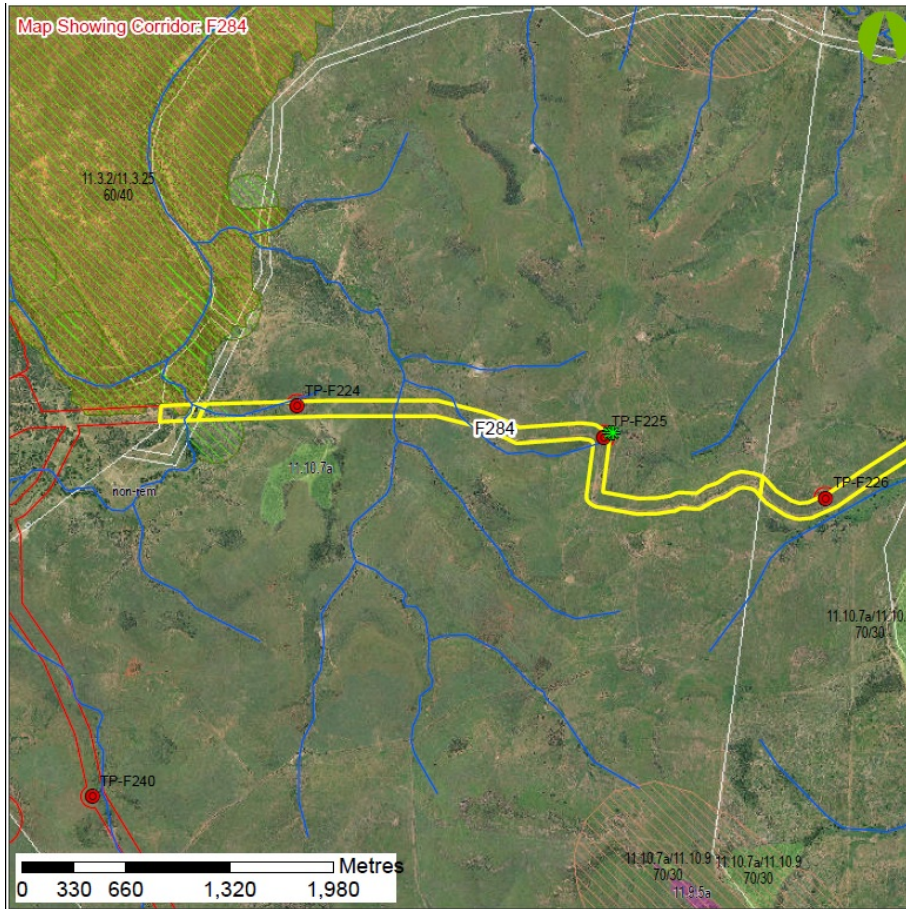


Figure 3-11 Aerial photograph and associated RE mapping of proposed corridor 284

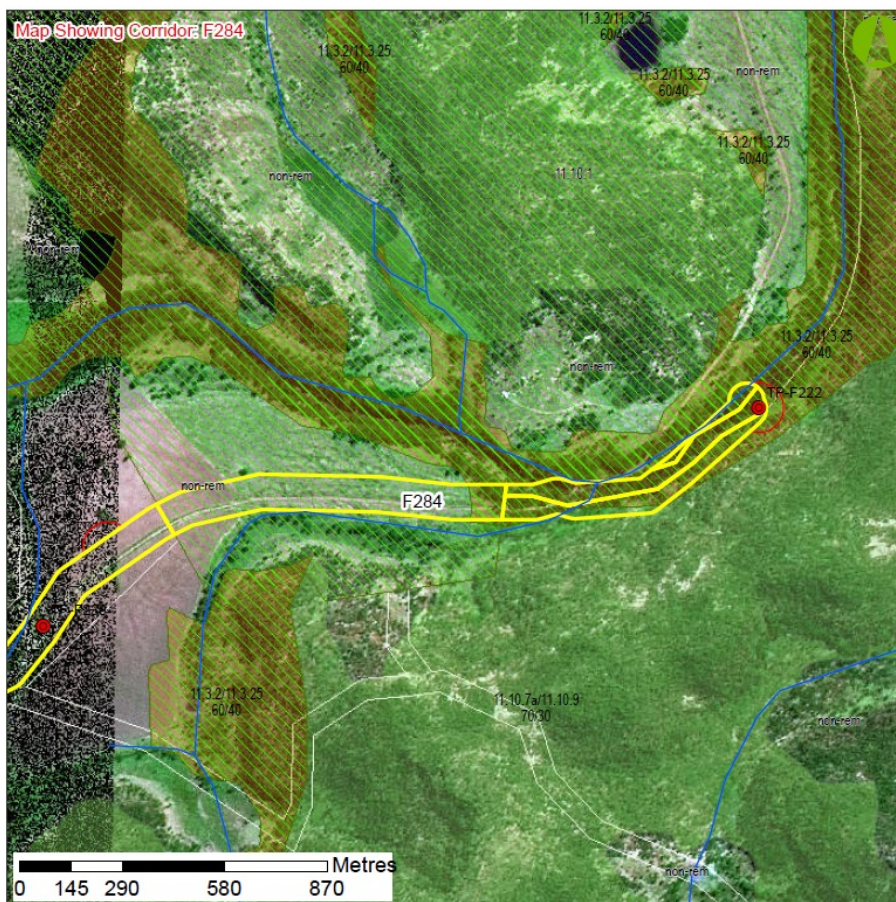


Figure 3-12 Aerial photograph and associated RE mapping of proposed corridor 284

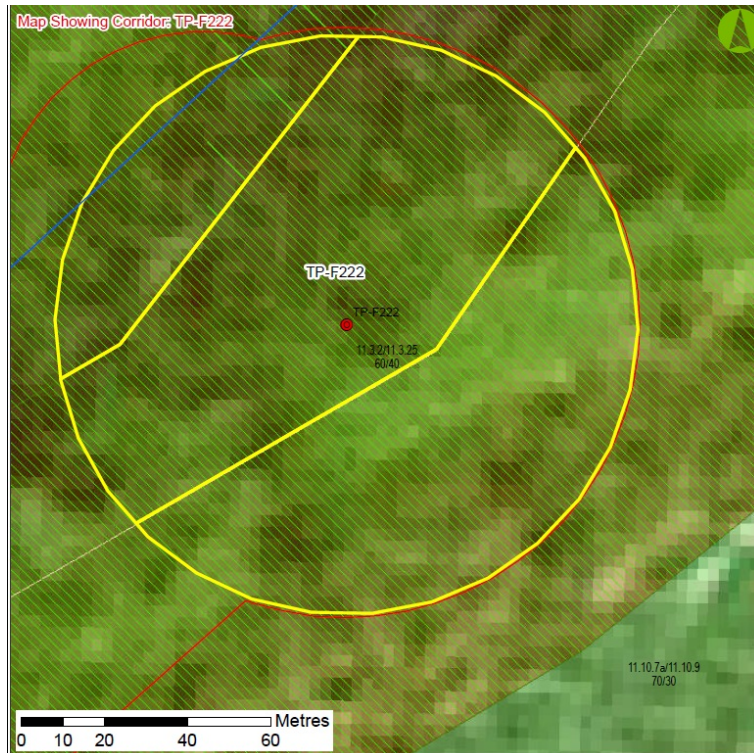


Figure 3-13 Aerial photograph and associated RE mapping of proposed geo-tech site TP-F222

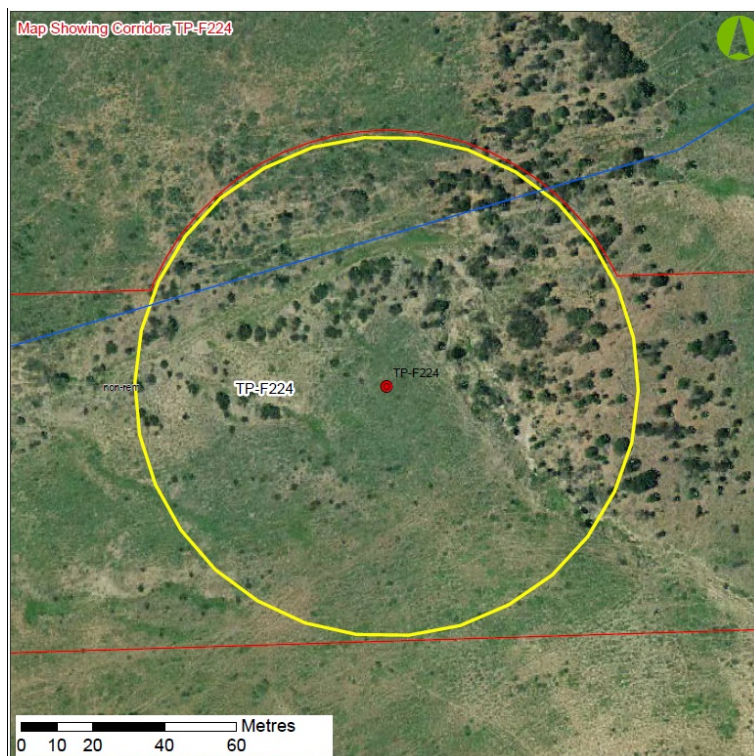


Figure 3-14 Aerial photograph and associated RE mapping of proposed geo-tech site TP-F224

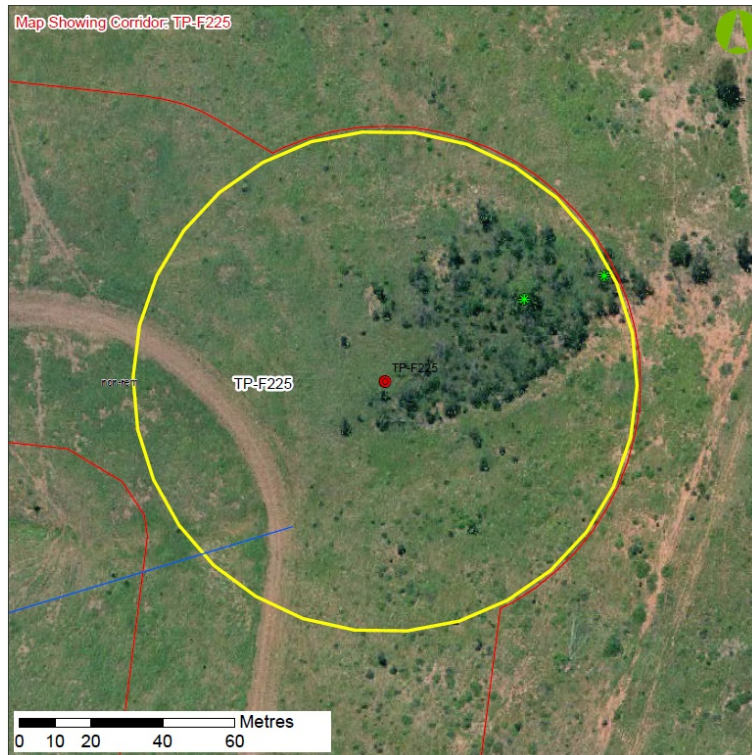


Figure 3-15 Aerial photograph and associated RE mapping of proposed geo-tech site TP-F225

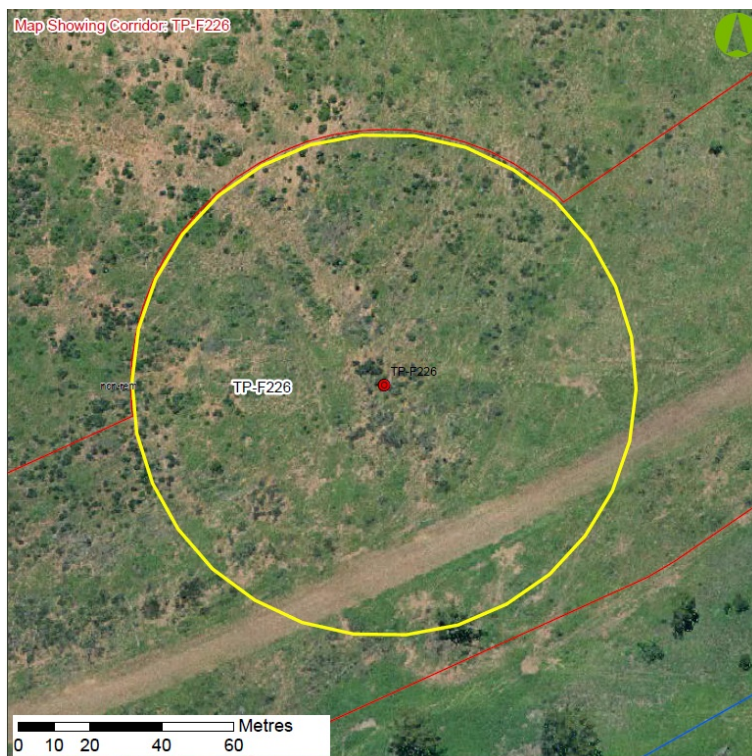


Figure 3-16 Aerial photograph and associated RE mapping of proposed geo-tech site TP-F226

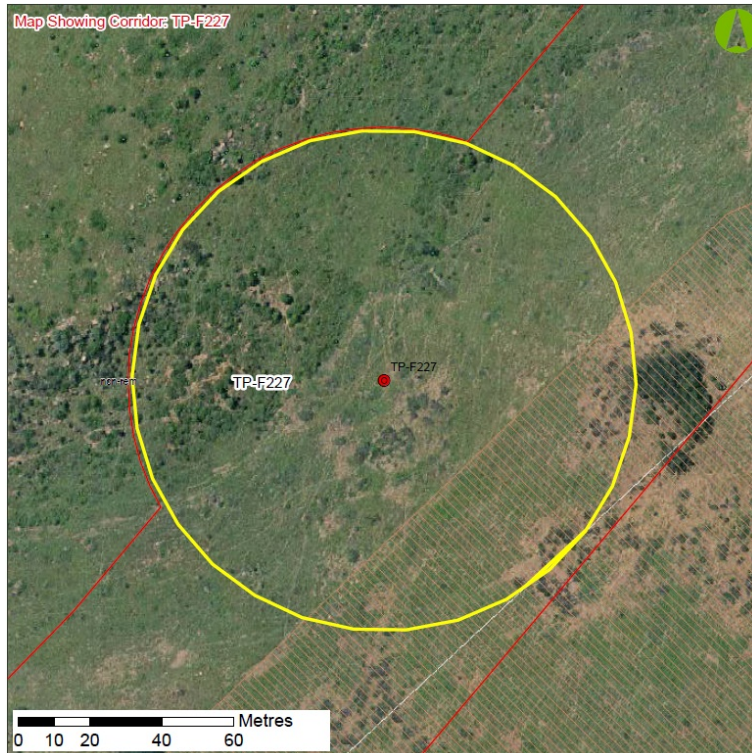


Figure 3-17 Aerial photograph and associated RE mapping of proposed geo-tech site TP-F227

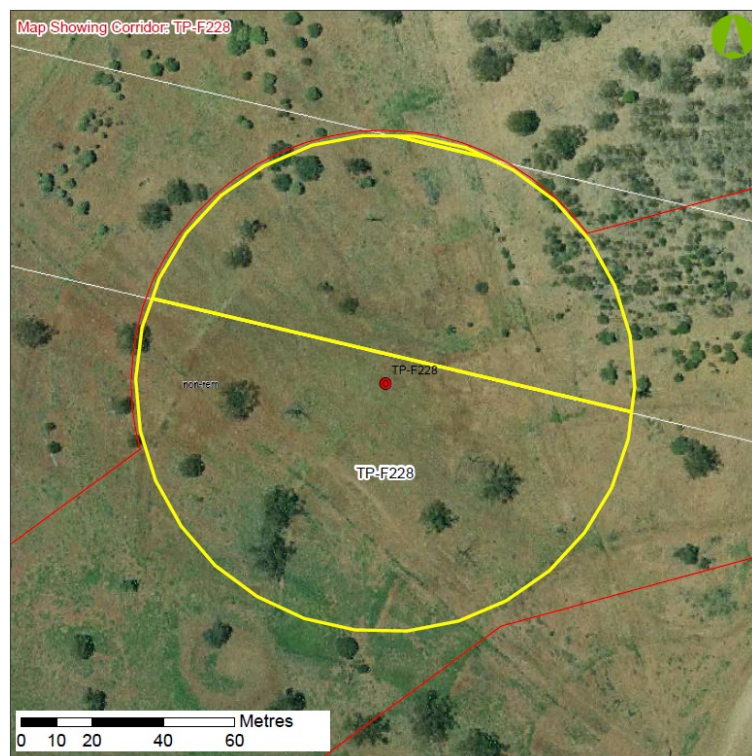


Figure 3-18 Aerial photograph and associated RE mapping of proposed geo-tech site TP-F228

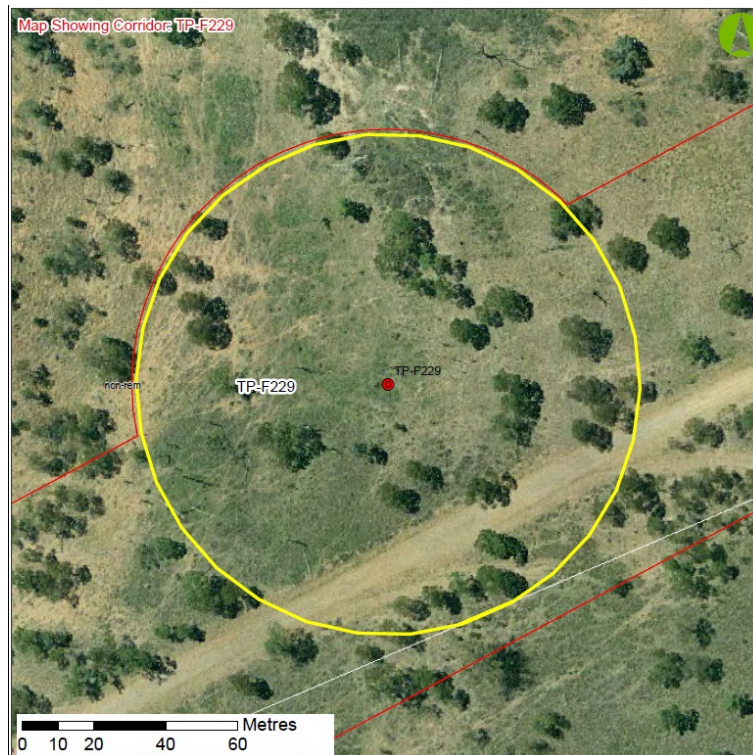


Figure 3-19 Aerial photograph and associated RE mapping of proposed geo-tech site TP-F222

Floristics

The remnant vegetation present within the proposed corridor is dominated by Eucalypt species. At the eastern end of the corridor near Hutton Creek *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus chloroclada* (Dirty Gum), and *Melaleuca viminalis* (Weeping Bottle-brush) dominated the riparian vegetation.

Further west away from the river, *Eucalyptus crebra* (Narrow-leaved Ironbark), *Angophora leiocarpa* (Smooth-barked Apple), *Eucalyptus populnea* (Poplar Box) and *Callitris glaucophylla* (White Cypress Pine) dominates the canopy layer. The mid-storey is dominated by *Geijera parviflora* (Wilga), and various *Acacia* species. The ground layer is typically grassy within the remnant patches of vegetation and consists of native species including *Themeda triandra* (Kangaroo Grass) and several *Aristida* species.

The historically cleared areas within the proposed corridor are dominated by *Pennisetum ciliare* (Buffel Grass) and scattered native grass species. Several small rocky knolls are present within the corridor and contain small amounts of remnant vegetation including *Brachychiton* species.

Towards the eastern end of the corridor, adjacent to Injune Road, the corridor passes through an open natural swamp. At the time of surveys, water was present throughout this area and flora diversity was high.

A total of seven (7) Type A restricted plants were recorded within the proposed corridor. The details and location of these plants are shown in Table 3-4.

Table 3-4 Location of Type A Restricted Plants (*Nature Conservation Act 1992*)

Species	Easting (GDA 94, Zone 55J)	Northing (GDA 94, Zone 55J)
<i>Brachychiton rupestris</i>	0716733	7153831
<i>Brachychiton rupestris</i>	0716724	7153843
<i>Brachychiton populneus</i>	0717348	7154480
<i>Brachychiton populneus</i>	0717624	7154659
<i>Brachychiton populneus</i>	0718530	7154653
<i>Brachychiton populneus</i>	0719184	7154861
<i>Brachychiton populneus</i>	0719216	7154879

A small remnant patch of *Acacia harpophylla* (Brigalow) which is listed under the EPBC Act was recorded within the corridor. Table 3-5 shows the location of this remnant.

Table 3-5 Location of EVNT listed species under the EPBC Act

Species	Easting (GDA 94, Zone 55J)	Northing (GDA 94, Zone 55J)
<i>Acacia harpophylla</i>	0710962	7152520

Habitat values

All remnant vegetated areas located within the proposed corridor are considered to have high habitat value. These areas exhibit key habitat attributes including mature trees, flowing water, arboreal and terrestrial hollows, fallen timber, structural complexity, rocky ridges, and fissured bark.

The eastern end of the corridor also forms part of a much larger patch of remnant vegetation, and as such should be considered likely to be used as a regional fauna corridor.

The remainder of the corridor has undergone severe clearing and as such is considered to have low habitat value. The lack of any over-storey and mid-storey within the corridor reduces the habitat quality significantly. Generalist fauna species such as macropods, birds of prey, and emus potentially may utilise the cleared areas for foraging.

A number of incidental fauna sightings were recorded during the survey of corridor F284. These were identified either by sight or by other traces such as scats, tracks or calls. Recorded species include:

Emu (*Dromaius novaehollandiae*), Dingo (*Canis lupis*), Australian Magpie (*Gymnorhina tibicen*), Pale-headed Parrot (*Platycercus adscitus*), Eastern Rosellas (*Platycercus eximius*), Sulfur-crested Cockatoo (*Cacatua galerita*), Richard's Pipit (*Anthus novaeseelandiae*), Feral Pig (*Sus scrofa*), Torresian Crow (*Corvus orru*), Eastern Grey Kangaroo (*Macropus giganteus*), Red-necked Wallaby (*Macropus rufogriseus*), Galah (*Cacatua roseicapilla*), Grey Butcher Bird (*Cracticus torquatus*), Pied Butcher Bird (*Cracticus nigrogularis*), Apostle Bird (*Struthidea cinerea*), European Rabbits (*Oryctolagus cuniculus*), Nankeen Kestrel (*Falco cenchroides*) and Cane Toad (*Bufo marinus*).

Squatter Pigeons (*Geophaps scripta scripta*) which is listed as an EVNT fauna species under the EPBC Act and the NC Act as Vulnerable was recorded in the western end of the corridor. The location is given below in Table 3-6.

Table 3-6 Location of EVNT listed species under the EPBC and NC Acts

Species	Easting (GDA 94, Zone 55J)	Northing (GDA 94, Zone 55J)
<i>Geophaps scripta scripta</i>	0710031	7152467

4. Conclusion

The proposed pipeline corridors and geo-tech sites occur across a variety of landscapes and vegetation types, with most of the proposed development occurring in previously disturbed areas. The eastern end of corridor F284 occurs within RE 11.3.2/11.3.25 'of concern – dominant' vegetation, this RE mapping was confirmed during the surveys. Hence, some areas of the proposed corridors are located within a 'Category C' ESA.

The proposed corridors intersect multiple watercourses. In the west of proposed disturbance area these are 1st and 2nd order streams with limited riparian vegetation, while in the east corridor F284 intersects the Hutton River (stream order 6) which is associated with high quality riparian vegetation.

Multiple Type A restricted plant species were observed within the proposed development area and occur within remnant and non-remnant areas. Two species of conservation significance under the EPBC Act were observed within the disturbance area, *Acacia harpophylla* (Brigalow) and Squatter Pigeons (*Geophaps scripta scripta*).

5. References

Eddie, C (2007) Field Guide to Trees and Shrubs of Eastern Queensland Oil and Gas Fields, First Edition, Santos Ltd, Adelaide.

Regional Ecosystem Mapping, Version 6.0, Queensland Government Department of Environment and Resource Management (DERM).



Appendix A
Flora species list



Appendix A

Family Name	Scientific Name	Common Name	F225	F226	F227	F228	F284
Adiantaceae	<i>Adiantum hispidulum</i>	rough maidenhair fern					x
Adiantaceae	<i>Cheilanthes aspera</i>	Bristly cloak fern			x		
Adiantaceae	<i>Cheilanthes sieberi</i>	Mulga Fern	x	x	x	x	x
Aizoaceae	<i>Trianthema portulacastrum</i>	Black Pigweed					x
Amaranthaceae	<i>Achyranthes aspera</i>	two spine burr				x	x
Amaranthaceae	<i>Alternanthera pungens</i>	Kaki Burr					x
Amaranthaceae	<i>Gomphrena celosioides</i>	Gomphrena Weed	x	x			
Apiaceae	<i>Hydrocotyle laxiflora</i>	Pennywort	x	x	x		
Apocynaceae	<i>Alstonia constricta</i>	Bitter Bark				x	x
Apocynaceae	<i>Carissa lanceolata</i>	Currant Bush					x
Apocynaceae	<i>Carissa ovata</i>	Currant Bush			x	x	x
Apocynaceae	<i>Gomphocarpus physocarpus</i>	Balloon Cotton Bush					x
Apocynaceae	<i>Parsonsia lanceolata</i>	Monkey Rope			x	x	x
Asteraceae	<i>Bidens pilosa</i>	Cobblers Pegs	x	x		x	x
Asteraceae	<i>Calotis cuneifolia</i>	Purple Burr Daisy	x	x	x	x	x
Asteraceae	<i>Calotis lappulacea</i>	Yellow Burr Daisy				x	x
Asteraceae	<i>Calotis multicaulis</i>	Woolly head burr daisy			x		
Asteraceae	<i>Chrysocephalum apiculatum</i>	Yellow Buttons	x	x		x	x
Asteraceae	<i>Cirsium vulgare</i>	Spear Thistle, Black Thistle					x
Asteraceae	<i>Conyza bonariensis</i>	Fleabane	x	x	x		x
Asteraceae	<i>Conyza parva</i>	Fleabane	x	x			
Asteraceae	<i>Gamochaeta americana</i>		x	x			
Asteraceae	<i>Ixiolaena brevicompta</i>	Yellow Daisy					x
Asteraceae	<i>Podolepis jaceoides</i>	Showy Copper Wire Daisy	x	x	x		
Asteraceae	<i>Pterocaulon sphacelatum</i>	Apple Bush	x	x	x	x	x
Asteraceae	<i>Senecio lautus</i>	Fire Weed				x	x
Asteraceae	<i>Senecio madagascariensis</i>		x	x			
Asteraceae	<i>Sonchus oleraceus</i>	Sow Thistle	x	x			x
Asteraceae	<i>Tagetes minuta</i>	Stinking Rodger	x	x		x	x
Asteraceae	<i>Xanthium occidentale</i>	Noogoora Burr				x	x
Bignoniaceae	<i>Pandorea pandorana</i>	Wonga Vine					x
Brassicaceae	<i>Lepidium sagittulatum</i>	Pepper Cress	x	x			
Cactaceae	<i>Opuntia stricta</i>	Prickly Pear				x	x

Family Name	Scientific Name	Common Name	F225	F226	F227	F228	F284
Cactaceae	<i>Opuntia tomentosa</i>	Velvety Tree Pear	x	x	x	x	x
Campanulaceae	<i>Wahlenbergia communis</i>	Large Bluebells					x
Campanulaceae	<i>Wahlenbergia gracilis</i>	Sprawling Bluebell	x	x	x		
Capparaceae	<i>Apophyllum anomalum</i>	Warrior bush			x	x	x
Capparaceae	<i>Capparis lasiantha</i>	Native Orange				x	x
Capparaceae	<i>Capparis loranthifolia</i>	Nipan, Wait a while			x		x
Casuarinaceae	<i>Allocasuarina leuhmannii</i>	Bull Oak			x		x
Casuarinaceae	<i>Casuarina cristata</i>	Belah					x
Casuarinaceae	<i>Casuarina cunninghamiana</i>	River She-oak					x
Celastraceae	<i>Elaeodendron australis</i>	Peach Leaf				x	x
Celastraceae	<i>Maytenus cunninghamii</i>	Yellow Berry Bush				x	x
Chenopodiaceae	<i>Einadia nutans</i>	Climbing Saltbush				x	x
Chenopodiaceae	<i>Sclerolaena birchii</i>	Galvanised Burr	x	x	x	x	x
Cucurbitaceae	<i>Cucumis myriocarpus</i>	Paddy melon					x
Cupressaceae	<i>Callitris endlicheri</i>	Black Cypress Pine			x		
Cupressaceae	<i>Callitris glaucophylla</i>	White Cypress Pine	x	x	x	x	x
Cyperaceae	<i>Cyperus gracilis</i>	Bunchy Sedge	x	x			
Cyperaceae	<i>Cyperus gymnocaulos</i>	Sedge with nuts					x
Cyperaceae	<i>Cyperus ira</i>	Variable sedge				x	x
Cyperaceae	<i>Fimbristylis dichotoma</i>	Fimbristylis				x	x
Cyperaceae	<i>Gahnia aspera</i>	Gahnia					x
Euphorbiaceae	<i>Chamaesyce drummondii</i>	Caustic Weed				x	x
Fabaceae - Caesalpinioideae	<i>Senna artemisioides</i>	Senna				x	x
Fabaceae - Faboideae	<i>Crotalaria dissitiflora</i>	Grey Rattlepod					x
Fabaceae - Faboideae	<i>Crotalaria mitchellii</i>	Hairy Rattlepod	x	x			
Fabaceae - Faboideae	<i>Desmodium varians</i>	Tree Foil	x	x		x	x
Fabaceae - Faboideae	<i>Glycine tabacina</i>					x	x
Fabaceae - Faboideae	<i>Glycine tomentella</i>	Hairy Glycine	x	x			
Fabaceae - Faboideae	<i>Hovea lorata</i>	Hovea				x	x
Fabaceae - Faboideae	<i>Macroptilium lathyroides</i>	Phasey bean					x
Fabaceae - Faboideae	<i>Stylosanthes scabra</i>	Fine Stem Stylo				x	x
Fabaceae - Mimosoideae	<i>Acacia deanii</i>	Dean's Wattle					x
Fabaceae - Mimosoideae	<i>Acacia decora</i>	Pretty Wattle				x	x
Fabaceae - Mimosoideae	<i>Acacia excelsa</i>	Iron wood	x	x	x	x	x
Fabaceae - Mimosoideae	<i>Acacia harpophylla</i>	Brigalow			x	x	x

Family Name	Scientific Name	Common Name	F225	F226	F227	F228	F284
Fabaceae - Mimosoideae	<i>Acacia leiocalyx</i>	Black Wattle	x	x	x	x	x
Fabaceae - Mimosoideae	<i>Acacia oswaldii</i>	Umbrella Wattle	x	x			
Fabaceae - Mimosoideae	<i>Acacia pendula</i>	Weeping Myall	x	x			
Goodeniaceae	<i>Goodenia glabra</i>	Smooth Goodenia				x	x
Juncaceae	<i>Juncus usitatus</i>	Juncus			x	x	x
Lamiaceae	<i>Spartothamnella puberula</i>	Spiky Bush	x	x			
Lobeliaceae	<i>Pratia concolour</i>	Poison Pratia				x	x
Lomandraceae	<i>Lomandra leucocephala</i>	Lomandra				x	x
Lomandraceae	<i>Lomandra longifolia</i>	Lomandra	x	x			x
Lomandraceae	<i>Lomandra multiflora</i>	Lomandra					x
Luzuriagaceae	<i>Eustrephus latifolia</i>	Wombat Berry					x
Malvaceae	<i>Abutilon malvifolium</i>	Chinese Lantern			x		
Malvaceae	<i>Sida cordifolia</i>	Flannel weed	x	x	x		
Malvaceae	<i>Sida rohlenae</i>	Shrub Sida			x	x	x
Malvaceae	<i>Sida subspicata</i>	Queensland Hemp	x	x	x		x
Meliaceae	<i>Owenia acidula</i>	Emu Apple			x	x	x
Myoporaceae	<i>Eremophila mitchellii</i>	False Sandalwood				x	x
Myrtaceae	<i>Angophora floribunda</i>	Rough-barked Apple	x	x			
Myrtaceae	<i>Angophora leiocarpa</i>	Smooth-barked Apple			x		
Myrtaceae	<i>Corymbia citriodora</i>	Lemon scented gum	x	x			
Myrtaceae	<i>Corymbia clarksoniana</i>	Clarkson's Bloodwood			x	x	x
Myrtaceae	<i>Corymbia tessellaris</i>	Moreton Bay Ash	x	x	x	x	x
Myrtaceae	<i>Eucalyptus chloroclada</i>	Dirty Gum	x	x	x		x
Myrtaceae	<i>Eucalyptus crebra</i>	Narrow Leaved Ironbark	x	x			x
Myrtaceae	<i>Eucalyptus melanophloia</i>	Silver Leaved Ironbark	x	x	x		
Myrtaceae	<i>Eucalyptus populnea</i>	Poplar Box	x	x	x	x	x
Myrtaceae	<i>Eucalyptus tereticornis</i>	Queensland Blue Gum			x		x
Myrtaceae	<i>Melaleuca viminalis</i>	Weeping bottlebrush					x
Oleaceae	<i>Jasminum didymum</i> subsp. <i>racemosum</i>	Native Jasmine				x	x
Orchidaceae	<i>Cymbidium canaliculatum</i>	Black Orchid	x	x		x	
Oxalidaceae	<i>Oxalis stricta</i>	Yellow Wood Sorrel	x	x			
Papaveraceae	<i>Argemone ochroleuca</i>	Mexican Poppy					x
Phormiaceae	<i>Dianella revoluta</i> var. <i>revoluta</i>				x		
Phyllanthaceae	<i>Breynia oblongifolia</i>	Breynia			x	x	x

Family Name	Scientific Name	Common Name	F225	F226	F227	F228	F284
Phyllanthaceae	<i>Phyllanthus</i> sp.				X		
Picrodendraceae	<i>Petalostigma pubescens</i>	Quinine	X	X	X	X	X
Pittosporaceae	<i>Pittosporum angustifolium</i>	Native Apricot					X
Pittosporaceae	<i>Pittosporum spinescens</i>	Wallaby Apple			X		
Pittosporaceae	<i>Pittosporum undulatum</i>	Pittosporum			X		
Poaceae	<i>Aristida calycina</i>	Dark wiregrass				X	X
Poaceae	<i>Aristida caput medusae</i>	Curly Head Wire Grass	X	X	X	X	X
Poaceae	<i>Aristida jerichoensis</i>	Jericho wire grass	X			X	X
Poaceae	<i>Bothriochloa bladhii</i> subsp. <i>bladhii</i>	Forest Blue Grass					X
Poaceae	<i>Bothriochloa decipiens</i> var. <i>decipiens</i>	Pitted Bluegrass	X				
Poaceae	<i>Capillipedium spicigerum</i>	Scented-top grass				X	X
Poaceae	<i>Chloris divaricata</i>	Windmill Chloris				X	X
Poaceae	<i>Chloris gayana</i>	Rhodes Grass					X
Poaceae	<i>Chloris pectinata</i>	Comb Chloris			X		
Poaceae	<i>Chloris truncata</i>		X	X			
Poaceae	<i>Chloris ventricosa</i>	Tall Chloris			X		
Poaceae	<i>Cymbopogon refractus</i>	Barbwire Grass	X	X	X	X	X
Poaceae	<i>Dichanthium sericeum</i>	Queensland Blue Grass	X	X		X	X
Poaceae	<i>Digitaria coenicola</i>	Digitaria			X		
Poaceae	<i>Echinochloa colona</i>	Awnless Barnyard Grass	X	X			
Poaceae	<i>Enneapogon polyphyllus</i>	Limestone Bottle washer	X			X	X
Poaceae	<i>Enteropogon acicularis</i>	Curly Windmill Grass				X	X
Poaceae	<i>Enteropogon ramosus</i>	Twirly Windmill Grass					X
Poaceae	<i>Eragrostis brownii</i>	Browns Lovegrass	X	X	X	X	X
Poaceae	<i>Eragrostis cilianensis</i>	Stinkgrass	X	X			
Poaceae	<i>Eragrostis elongata</i>	Clustered Lovegrass	X	X			
Poaceae	<i>Eragrostis leptocarpa</i>	Drooping Lovegrass				X	X
Poaceae	<i>Eragrostis sororia</i>	Blue eragrostis	X		X		
Poaceae	<i>Heteropogon contortus</i>	Black Spear Grass	X	X	X	X	X
Poaceae	<i>Melinis repens</i>	Red Natal	X	X	X	X	X
Poaceae	<i>Panicum decompositum</i>	Hairy Panic	X	X	X	X	X
Poaceae	<i>Panicum effusum</i>	Inquisitive Grass	X	X			
Poaceae	<i>Paspalidium caespitosum</i>	Brigalow Grass	X			X	X
Poaceae	<i>Paspalum dilatatum</i>	Paspalum			X		
Poaceae	<i>Paspalum paniculatum</i>	Paspalum					X

Family Name	Scientific Name	Common Name	F225	F226	F227	F228	F284
Poaceae	<i>Pennisetum ciliare</i>	Buffel Grass	x	x	x	x	x
Poaceae	<i>Perotis rara</i>	Comet Grass	x	x			x
Poaceae	<i>Setaria surgens</i>	Pigeon Grass	x	x			
Poaceae	<i>Sporobolus caroli</i>	Desert Sporobolus	x	x		x	x
Poaceae	<i>Sporobolus creber</i>	Western Rats Tail Grass	x	x	x		x
Poaceae	<i>Sporobolus elongatus</i>	Tall sporobolus				x	x
Poaceae	<i>Themeda avenacea</i>	Wild Oats Grass	x	x	x		
Poaceae	<i>Themeda quadrivalvis</i>	Grader Grass	x	x	x	x	x
Poaceae	<i>Themeda triandra</i>	Kangaroo Grass				x	x
Poaceae	<i>Tragus australianus</i>	Burr Grass	x	x	x		
Poaceae	<i>Triraphis mollis</i>	Purple plume grass				x	x
Proteaceae	<i>Grevillea striata</i>	Beefwood	x	x	x	x	x
Proteaceae	<i>Hakea lorea</i>	Bootlace Oak				x	x
Rhamnaceae	<i>Alphitonia excelsa</i>	Red Ash	x	x	x	x	x
Rubiaceae	<i>Canthium oleifolium</i>	Hat stand, Wild Lemon					x
Rubiaceae	<i>Psydrax oleifolia</i>	Canthium			x	x	x
Rutaceae	<i>Citrus glauca</i>	Lime bush				x	x
Rutaceae	<i>Geijera parviflora</i>	Wilga	x	x	x	x	x
Sapindaceae	<i>Alectryon diversifolius</i>	Scrub Boonaree				x	x
Sapindaceae	<i>Atalaya hemiglauc</i>	Whitewood				x	x
Sapindaceae	<i>Dodonaea viscosa</i>	Sticky Hopbush				x	x
Solanaceae	<i>Solanum brownii</i>	Violet Nightshade					x
Solanaceae	<i>Solanum ellipticum</i>	Potato Bush	x	x	x		
Sterculiaceae	<i>Brachychiton populneus</i>	Kurrajong	x	x	x		x
Sterculiaceae	<i>Brachychiton rupestris</i>	Narrow Leaved Bottle Tree					x
Tiliaceae	<i>Grewia latifolia</i>	Dysentery Plant				x	x
Verbenaceae	<i>Verbena bonariensis</i>	Bunchy Verbena, Purpletop Verbena					x
Verbenaceae	<i>Verbena officinalis</i>	Common Verbena, Native Verbena					x
Verbenaceae	<i>Verbena tenuisecta</i>	Mayne's Curse	x	x	x	x	x
Vitaceae	<i>Cissus opaca</i>	Native Grape				x	x