



TROPICANA GOLD PROJECT
Tropicana – Transline Infrastructure Corridor
Vegetation and Flora Survey



*Providing sustainable environmental strategies,
management and monitoring solutions
to industry and government.*





**Tropicana Gold Project
Tropicana Joint Venture
Tropicana-Transline Infrastructure Corridor:
Vegetation and Flora Survey**

July 2009





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Executive Summary

The Tropicana JV (TJV) is currently undertaking pre-feasibility studies on the viability of establishing the Tropicana Gold Project (TGP), which is centred on the Tropicana and Havana gold prospects. The proposed TGP is located approximately 330 km east north-east of Kalgoorlie, and 15 km west of the Plumridge Lakes Nature Reserve, on the western edge of the Great Victoria Desert (GVD) biogeographic region of Western Australia. The project is a joint venture between AngloGold Ashanti Australia Limited (70% and Manager) and the Independence Group NL.

As part of the proposed TGP the TJV intends to construct an infrastructure corridor between Kalgoorlie and the project area. The infrastructure corridor will contain an access road and / or fibre optical cable for site communications. The TJV is current evaluating two different routes, one via Pinjin Station and one via the existing Trans Australian Railway Line Access Road. This report presents the findings of the flora and vegetation assessment for the Tropicana-Transline option. The proposed infrastructure corridor travels south of the proposed TGP, west of the boundary of Plumridge Lakes Nature Reserve (immediately east of Tropicana) and south to the Trans Australian Railway Line Access Road; it is to be called the Tropicana-Transline Infrastructure Corridor (Corridor). The Corridor will be located within Miscellaneous License L39/186, granted under the WA Mining Act.

AngloGold Ashanti Australia on behalf of the TJV contracted *ecologia* Environment to conduct a level one flora and vegetation survey along the route of the proposed Corridor. The results are to be used during the environmental impact assessment process for the project. The objectives of the survey were to:

- Survey the flora and vegetation along the proposed Corridor to determine whether any species or ecological communities of conservation significance occur along the route, and if present, indicate management options to prevent or minimise the impacts due to disturbance; and
- Map the main vegetation units occurring along the length of the proposed track.

A baseline survey of the vegetation and vascular flora of the Corridor was undertaken between the 13th and 22nd of July, 2007; one section of the Corridor could not be surveyed during this time and it was assessed between the 20th and 24th of August 2007. One hundred and fourteen quadrats and 59 transects were surveyed along the Corridor.

Four hundred and seventeen flora taxa were recorded along the Corridor including subspecies, varieties, forms and affinities. The taxa comprised 52 families, 142 genera and 372 confirmed species. The most species rich plant families were: Myrtaceae (43 confirmed species), Mimosaceae (34 confirmed species), Poaceae (29 confirmed species), Chenopodeaceae (26 confirmed species) and Myoporaceae (25 confirmed species). The most species rich genera were *Acacia* (34 confirmed species), *Eucalyptus* (29 confirmed species) and *Eremophila* (24 confirmed species): 19 families and 83 genera were represented by a single taxon. Only one of the 417 taxa recorded was a weed species.

Nine main vegetation units were mapped along the Corridor and these were further divided into 21 vegetation sub-units. The main vegetation types recorded were: Mixed *Eucalyptus* woodland over hummock grassland, *Callitris preissii* tall shrubland, Mixed *Eucalyptus* woodland over *Triodia scariosa* hummock grassland, Mixed *Eucalyptus* woodland with *Acacia* understorey, over *Triodia desertorum* hummock grassland, *Triodia rigidissima* hummock grasslands, *Acacia aneura* woodland, Heath, *Triodia basedowii* hummock grassland and *Casuarina* shrubland over low heath.

No federally or state protected Declared Rare Flora taxa or threatened ecological communities were recorded during the survey. One priority ecological community occurs in the area – “Yellow sandplain communities of the Great Victoria Desert”. Fourteen Priority



flora taxa and two of potential conservation significance were recorded, along with six taxa with marked range extensions.

Conformance of the project to relevant EPA statements is addressed in the body of this report along with the conservation significance of the vegetation and flora of the Corridor and an assessment of potential impacts. Significant threats to biodiversity, ecological function, vegetation and flora of conservation significance identified by a risk analysis include vegetation clearing, fire, dust and off-road driving. Possible management options are included in a risk analysis for consideration.



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1.0 Introduction

1.1 PROJECT OVERVIEW

The Tropicana JV (TJV) is currently undertaking pre-feasibility studies on the viability of establishing the Tropicana Gold Project (TGP), which is centred on the Tropicana and Havana gold prospects. The proposed TGP is located approximately 330 km east north-east of Kalgoorlie, and 15 km west of the Plumridge Lakes Nature Reserve, on the western edge of the Great Victoria Desert (GVD) biogeographic region of Western Australia (Figure 1.1). The project is a joint venture between AngloGold Ashanti Australia Limited (AngloGold 70% and Manager) and the Independence Group NL.

The TGP consists of three main components (Figure 1.1):

- Operational Area - this area contains the mine, processing plant, aerodrome, village and other associated infrastructure;
- Water Supply Area - two basins have been investigated, the Minigwal Trough and Officer Basin; and
- Infrastructure Corridor - two options are under consideration (Tropicana-Transline and Pinjin Road options).

As part of the proposed TGP the TJV intends to construct an infrastructure corridor between Kalgoorlie and the project area. The infrastructure corridor will contain an access road and / or fibre optical cable for site communications. The TJV is current evaluating two different routes one via Pinjin Station and one via the existing Trans Australian Railway Line Access Road. This report presents the findings of the flora and vegetation assessments for the Trans Australian Railway Line – Tropicana-Transline option. The proposed infrastructure corridor travels south of the proposed TGP, west of the boundary of the Plumridge Lakes Nature Reserve (immediately east of Tropicana) and along the route of a 4WD track locally known as the Cable Haul Road to the Trans Australian Railway Line Access Road; it is to be called the Tropicana-Transline Infrastructure Corridor (Corridor). The corridor will be located within Miscellaneous License L39/186 granted under the WA *Mining Act*.

The Corridor will require the widening of approximately 120 km of existing tracks, and the construction of approximately 95 km of new clearing connecting the southern part of the Corridor to the proposed TGP (blue line on Figure 1.2). Another approximately 33 km long section of the existing Cable Haul Road corridor was also surveyed (orange line on Figure 1.2) as this potentially could be widened as part of the project. The new section of the Corridor runs to the west of Plumridge Lakes Nature Reserve and at its closest point is approximately 3.5 km away from the western boundary of the reserve.

The proposed Corridor will be up to 30 m wide depending on the infrastructure established. In order to help to avoid areas of significant vegetation or populations of federally or state listed threatened plant species a 200 m wide corridor was assessed along its length.

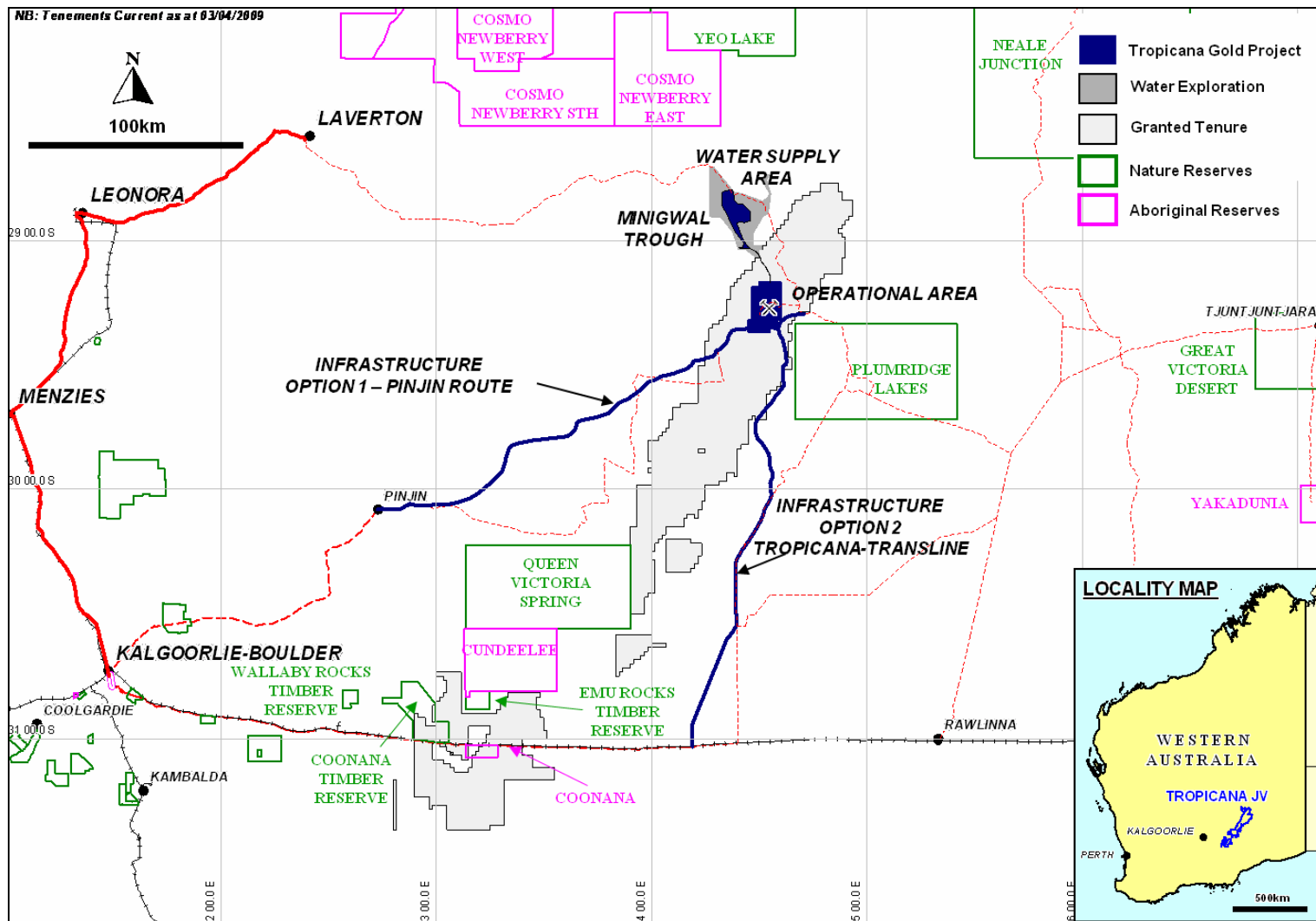


Figure 1.1: Location of the Tropicana Gold Project area

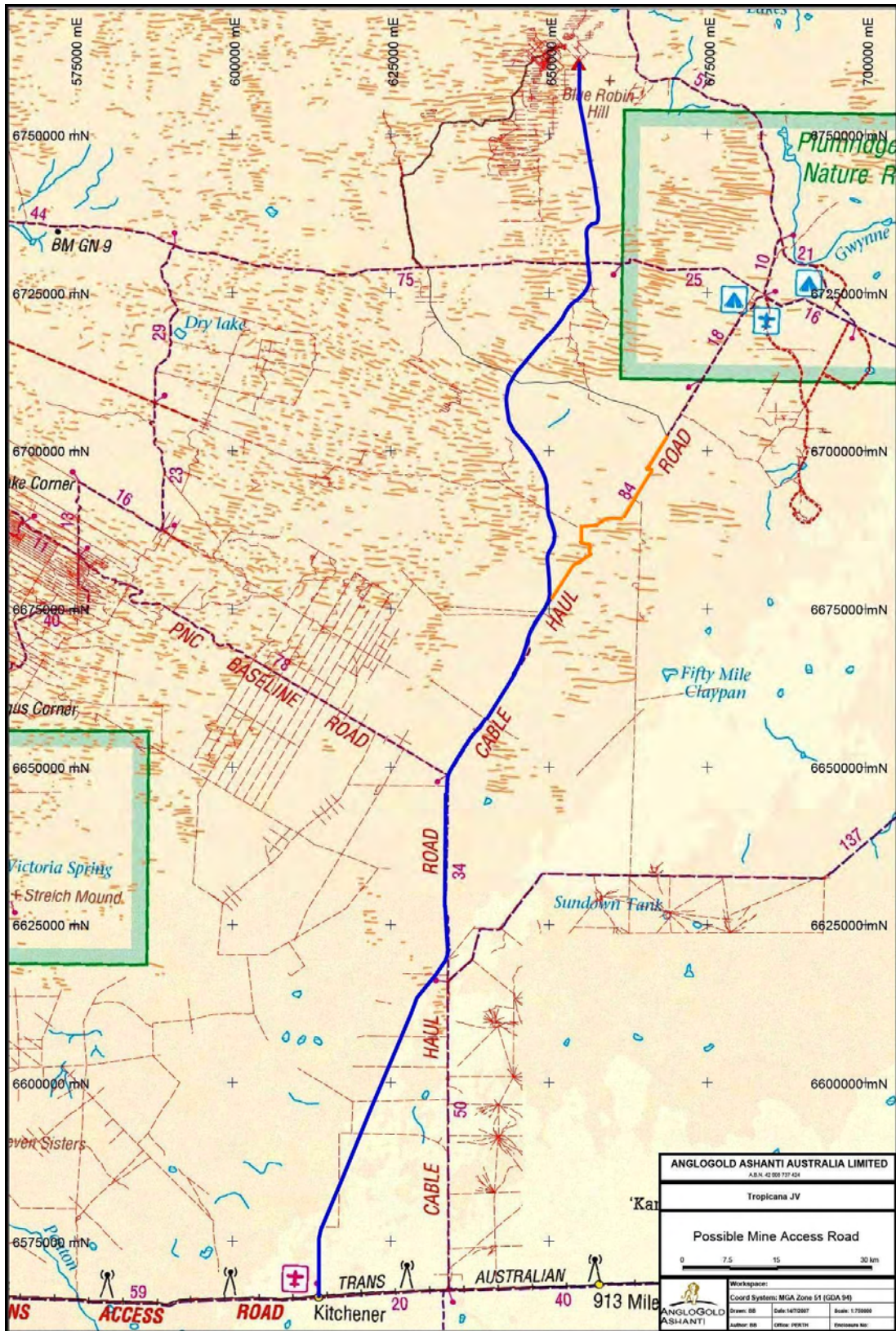


Figure 1.2: Tropicana-Transline Infrastructure Corridor (blue and orange lines)



1.2 PREVIOUS BIOLOGICAL SURVEYS

Early flora survey work was carried out by Burbidge *et al.* (1976), McKenzie & Burbidge (1979), and Newby *et al.* (1984), while broad-scale vegetation mapping of the Great Victoria Desert was carried out by Beard (1974; 1975). More recently Pearson (1994) carried out fine-scale mapping of the Queen Victoria Springs Reserve.

The flora of the Great Victoria Desert and Nullarbor is currently poorly known. Prior to other surveys of the flora and vegetation of the Tropicana project area undertaken by *ecologia*, few baseline flora and vegetation studies of the nature reserves or other lands in these bioregions have been undertaken. Many records from the area currently held by the WA Herbarium are the result of opportunistic collections by travellers or botanists with a narrow focus on particular families or genera.

No published fine-scale floristic surveys exist for the study area. Unpublished surveys undertaken in the vicinity include a flora survey at nearby Plumridge Lakes Nature Reserve (Mattiske, 2000), a survey of the Queen Victoria Springs Nature Reserve (Pearson, 1994), and a flora and vegetation survey undertaken at the Mulga Rock exploration area, approximately 150 km south-west of Tropicana (Martinick and Associates, 1986).

Ecologia has undertaken eight surveys at Tropicana and Plumridge Lakes (*ecologia*, 2005a; 2005b; 2006a; 2006b; 2006c; 2008a; 2008b and 2009a in prep) and a brief outline of the results is provided below.

One hundred and forty species from 33 families and 75 genera were recorded during a Rare and Priority flora survey at Plumridge Lakes (*ecologia*, 2005a). The most numerous represented families were Mimosaceae, Asteraceae (both with 24 species), Poaceae, Chenopodiaceae and Myoporaceae (each with 11 species). The most commonly recorded genera were *Acacia* (14 species), *Eremophila* (11 species) and *Eucalyptus* (7 species).

One hundred and five species from 33 families and 66 genera were recorded during a floristic survey within a proposed disturbance area at Tropicana exploration area (*ecologia*, 2005b). The most numerous represented families were Myrtaceae (14 species), Asteraceae (11 species), Myoporaceae and Goodeniaceae (both with 7 species). The most commonly recorded genera were *Eucalyptus* (10 species), *Eremophila* (7 species) and *Acacia* (6 species).

One hundred and fifty two species from 38 families and 80 genera were recorded during a track clearance survey of an area between the Tropicana exploration area and the old PNC camp (*ecologia*, 2006a). The most numerous represented families were Myrtaceae (27 species), Mimosaceae (19 species) and Lamiaceae (14 species). The most commonly recorded genera were *Acacia* (19 species), *Eucalyptus* (13 species) and *Eremophila* (7 species).

During a track clearance survey between the Plumridge East-West track and the Cable Haul Road (*ecologia*, 2006b) 165 species from 41 families and 94 genera were recorded. The most numerous represented families were Myrtaceae (22 species), Goodeniaceae (17 species) and Mimosaceae (13 species). The most commonly recorded genera were *Acacia* and *Eucalyptus* (both 13 species), and *Eremophila* and *Goodenia* (both 6 species).

One hundred and fifteen species from 33 families and 73 genera were recorded during the Tropicana South rare flora assessment (*ecologia*, 2006c). During this survey the most numerous represented families were Myrtaceae (12 species), Mimosaceae (9 species) and Poaceae / Chenopodiaceae / Myoporaceae (8 species each). The most commonly recorded genera were *Acacia* (9 species), *Eremophila* and *Eucalyptus* (both 8 species).

A survey was undertaken of the proposed north-west track extension and 132 taxa from 33 families and 73 genera were recorded during the survey. Of these taxa, two were identified



to genus level only. During this survey the most numerous represented families were Mimosaceae (15 species), Poaceae (15 species), Myrtaceae (14 species) and Myoporaceae (10 species) and no alien (weed) species were recorded.

A two-phase baseline vegetation and flora survey of the wider Tropicana Gold Project was carried out in 2006 and 2007 (*ecologia*, 2009a in preparation). A total of 446 taxa was recorded, including three naturalized alien taxa. Fifty seven families were represented by 162 genera. Fifty three collections could not be identified beyond genus level due to a lack of reproductive material, whilst an additional nine taxa were identified to species level with a degree of uncertainty. A further four collections, excluded from the total above, could not be identified beyond family level. The most numerous represented families were Poaceae (42 taxa), Chenopodiaceae (31 species), and Mimosaceae (24 species). The most commonly recorded genera were *Acacia* (24 species), *Eremophila* (16 species), and *Eucalyptus* (14 species).

1.3 SURVEY OBJECTIVES

AngloGold commissioned *ecologia* Environment (*ecologia*) on behalf of the TJV to undertake a Level 1 baseline survey of the vegetation and flora of the Corridor.

The EPA's objectives with regards to management of native flora and vegetation are to:

- Avoid adverse impacts on biological diversity comprising the different plants and animals and the ecosystems they form, at the levels of genetic, species and ecosystem diversity.
- Maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities.
- Protect Declared Rare Flora consistent with the provisions of the *Wildlife Conservation Act 1950*.
- Protect other flora species of conservation significance.

Hence, the primary objective of this study was to provide sufficient information to the EPA to assess the impact of the project on the vegetation and flora of the area, thereby ensuring that these objectives are upheld.

Specifically, the objectives of this study were to undertake a survey that satisfies the requirements documented in EPA Guidance Statement 51 and Position Statement No. 3, thus providing:

- A review of background information (including literature and database searches).
- An inventory of vegetation types and flora species occurring in the study area, incorporating recent published and unpublished records.
- An inventory of species of biological and conservation significance recorded or likely to occur within the project area and surrounds.
- A map and detailed description of vegetation types occurring in the study area.
- A description of the characteristics of the vegetation types.
- An appraisal of the current knowledge base for the area, including a review of previous surveys conducted in the area with relevance to the current study.
- A review of regional and biogeographical significance, including the conservation status of species recorded in the project area.



To this end the study was conducted to determine the potential impacts of the Corridor on the vegetation and flora of the proposed area of impact and this report includes:

- An inventory of:

Vascular flora species occurring in the study area, incorporating recent published and unpublished records;

Biologically significant species, including rare flora in the study area;

Vegetation associations occurring in the study area; and

Habitats and vegetation associations in the study area that are poorly represented, or that are essential to the survival of rare flora.

- A review of:

Regional and local conservation value of flora present, or likely to be present, in the study area;

Flora species of particular conservation value, such as Rare or Priority species, likely to occur in the study area;

Current impact of the land-use on vegetation associations; and

Other potential impacts on the existing environment.

- Recommendations for:

Flora habitat management and the management of under-represented vegetation associations that will accommodate future land use practices;

Priority flora and weed management; and

Management of current and future potential impacts on the existing environment.



2.0 Biophysical Environment

2.1 CLIMATE

The northern section of the Corridor is located in the south-west of the Great Victoria Desert, which experiences an arid climate with summer and winter rainfall ranging from 150 to 190 mm per year (Beard, 1974; Beard, 1975; Barton & Cowan, 2001). The Corridor falls between the 178 and 203 mm rainfall isohyet range on the Bureau of Meteorology rainfall map of this region, receiving approximately 200 mm annually (Beard, 1974). Temperatures may range between -3°C and 48°C, with the highest temperatures in January and February and the lowest in July and August.

The southern section of the Corridor is located on the boundary between the southern Great Victoria Desert and the Nullarbor (Nyanga Plain), and experiences a semi-arid to arid climate with a mean rainfall of between 180 and 230 mm (Bunting & van de Graaff, 1977). Rainfall is fairly evenly distributed throughout the year but is sporadic, and long periods of drought are common.

No long-term climate records are available for the study area and the closest Bureau of Meteorology weather stations with current records are located at; Laverton, approximately 220 km north-east of the northern end of the road, Balgair, approximately 100 km south-east of the southern end of the road; and Kalgoorlie-Boulder, approximately 260 km west of the southern end of the road. Climatic conditions for the project area can be extrapolated from data recorded at these three locations (Table 2.1). Laverton, Balgair and Kalgoorlie-Boulder stations receive more rainfall than that indicated by Beard (1974, 1975) and Barton & Cowan (2001) for the Great Victoria Desert.

Table 2.1: Summary of climatic data for Laverton, Balgair and Kalgoorlie-Boulder weather stations

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Laverton												
Mean max (°C)	35.8	34.8	31.9	27.2	22.1	18.5	17.8	20.0	24.5	28.0	32.1	34.9
Mean min (°C)	20.5	20.0	18.0	13.9	9.5	6.6	5.2	6.4	9.5	12.8	16.6	19.3
Mean rainfall (mm)	24.3	30.1	30.7	22.6	24.1	24.4	16.4	13.7	8.2	8.5	13.6	17.1
Balgair												
Mean max (°C)	32.8	31.9	29.5	26.3	22.3	19.1	18.7	20.6	24.2	26.7	29.2	30.9
Mean min (°C)	16.3	16.7	14.8	11.9	9.0	6.1	5.2	5.9	8.3	10.5	12.8	14.7
Mean rainfall (mm)	21.1	27.7	30.8	21.3	24.0	24.8	17.2	19.1	17.3	15.6	23.6	36.4
Kalgoorlie-Boulder Airport												
Mean max (°C)	33.6	32.1	29.5	25.1	20.6	17.5	16.7	18.5	22.2	25.7	28.9	32.0
Mean min (°C)	18.2	17.8	16.0	12.6	8.6	6.1	4.9	5.5	8.0	10.9	14.0	16.6
Mean rainfall (mm)	23.2	30.9	24.5	21.5	27.1	29.1	24.7	21.7	14.2	15.0	17.7	16.2



The information presented in Table 2.1 was compiled using records from:

- Laverton - located at 28.63 °S/ 122.41 °E (records from 1899 – 2007);
- Balgair - located at 31.09 °S/ 125.66 °E (records from 1982 – 2007); and
- Kalgoorlie-Boulder Airport - located at 30.78 °S/ 121.45 °E (records from 1939 – 2007) (Bureau of Meteorology, 2007).

Mean annual rainfall records for Balgair, Laverton and Kalgoorlie-Boulder are 277.8 mm, 233.4 mm and 266.1 mm respectively. Most rainfall at Balgair and Laverton stations occurs during the late summer months and early winter, while at Kalgoorlie-Boulder the rainfall is distributed fairly evenly throughout the year (Figure 2.1), although with considerable variation from year to year. The climate is strongly influenced by a band of high pressure known as the sub-tropical ridge. For much of the year this ridge is located to the south, allowing east to southeast winds to prevail. The ridge moves north during winter allowing the occasional cold front to pass over the Goldfields.

Summer rainfall is generally associated with cyclonic rainfall extending into the interior, and this may result in heavy rainfall between January and April (Laverton received 233.6 mm in February 1995 and Kalgoorlie received 307.8 mm in February 1948). It is not uncommon for very little rain to occur for months. Historically the lowest annual rainfall received at Laverton was 65.6 mm (1928), 140.7 mm at Balgair (1991), and 108.7 mm at Kalgoorlie (1940). Rainfall for the 12 month period prior to the first of the surveys (13th-23rd of July 2007), was 251 mm for Laverton, 279 mm for Balgair, and 215 mm for Kalgoorlie-Boulder (BoM, 2007).

Kalgoorlie-Boulder has a dry climate with hot summers and cool winters, (BoM 2007). January is the hottest month with an average maximum of 33.6°C, and temperatures of above 40°C occur nearly once a week. Winters are cool with July being the coolest month, with average maximum and minimum temperatures of 16.5°C and 4.8°C respectively. The lowest maximum temperature recorded was 7.2°C on 19 July 1961. Overnight temperatures fall below freezing about 4 times in a typical winter; such events occur on clear nights following a day of cold southerly winds.

Temperature extremes are also experienced in the region, with the highest maxima at Laverton and Balgair being 46.1°C (1957) and 47.6°C (1991) respectively. Lowest minima fall below zero during the winter months and the lowest minima recorded at Laverton and Balgair were -2.4°C (1969) and -5.0°C (2006) respectively.

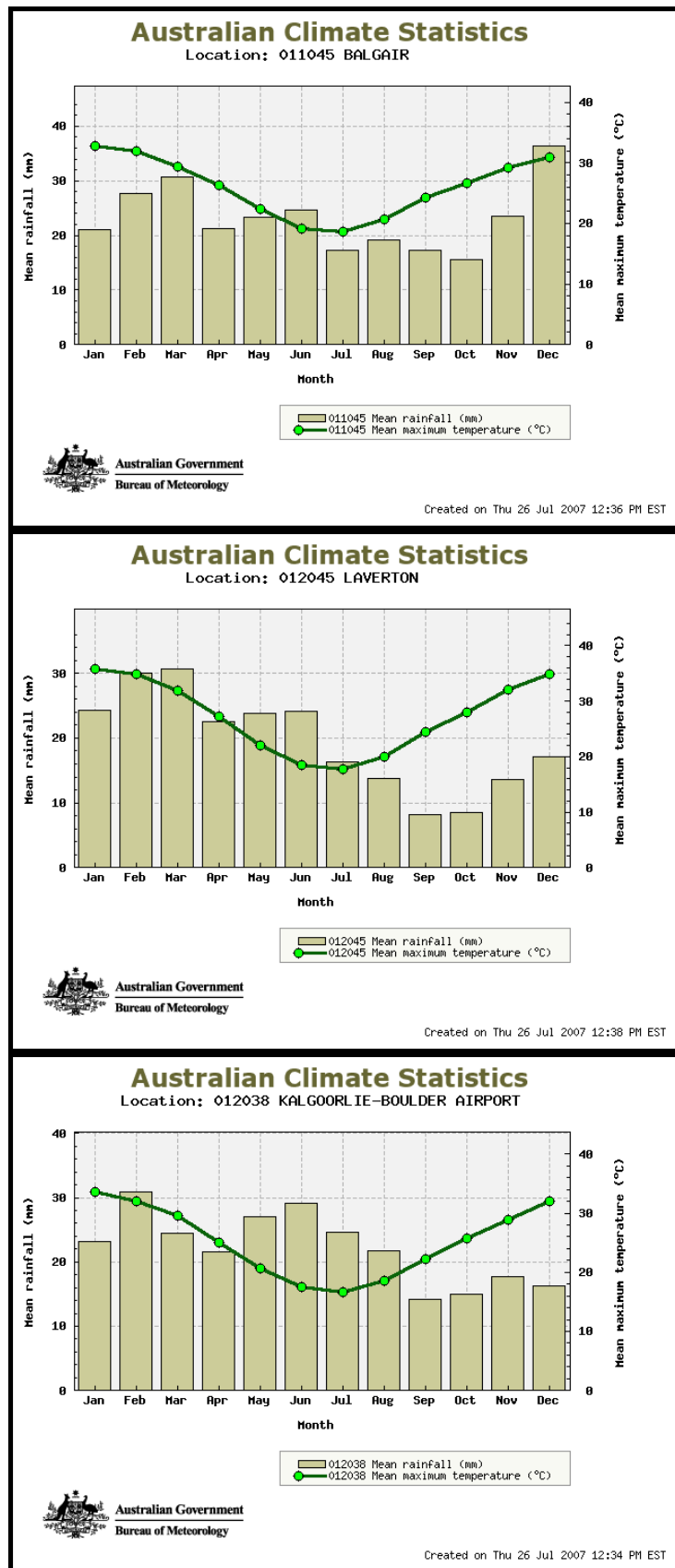


Figure 2.1: Mean monthly rainfall and mean maximum temperature data for Balgair, Laverton and Kalgoorlie-Boulder weather stations (BoM, 2007)



2.2 GEOLOGY

The geology of the study area has been mapped and described in detail by van de Graaff and Bunting (1977), and Bunting and van de Graaff (1977). The northern section of the Corridor lies over the eastern edge of the Yilgarn Block and its transition zone with the Albany-Fraser Province. The Yilgarn Block contains some of the oldest rocks of the Western Australian Shield, and is dominantly granite with belts of greenstone rocks. The Albany-Fraser Province transition zone contains Archaean rocks that have been metamorphosed and intruded by granite during the Proterozoic (Van de Graff & Bunting, 1977). The southern section of the Corridor is located in the eastern zone of the Albany-Fraser Province. These rocks consist of gneiss, granite, and migmatite of the Fraser complex and are covered entirely by Phanerozoic sediments.

The dominant geological substrates along the northern section of the Corridor from the PNC Baseline Road junction to the proposed TGP are described as:

- Eolian sand; red quartz sand in seifs, longitudinal dunes, and interdunal corridors; gypsum and quartz sand, in crescentic or lunette dunes.
- Colluvium; silt, sand, pebbles of ferruginous laterite and silcrete that accumulates in depressions and base of breakaways; colluvium of clay, silt and sand, partly saline, occurring in trunk valleys.
- Lake deposit; gypsum, halite, clay, and sand deposited in trunk valleys.
- Upper part of laterite profile; white, kaolinised bed-rock; sand with ferruginous pisoliths.
- Hybrid rocks: ademellite to gabbro.
- Outcrops of banded quartz magnetite rock: banded iron-formation (BIF).
- Layered mafic intrusion: metamorphosed garnetiferous gabbro, hornblendite.
- Granitic rocks of uncertain age.

The dominant geological substrates along the southern section of the Corridor from the PNC Baseline Road junction to the Trans Access Road are described as:

- Aeolian sand; red and yellow quartz sand; in seif dunes and sand plains.
- Residual clay and kankar-residual clay containing sheet and nodular kankar, overlies Nullarbor Limestone.
- Recrystallised limestone; small area on the southern-most section of the corridor.

Aeolian sands of the Great Victoria Desert cover the majority of the northern section of the study area, which overlie the Gunbarrel Basin (Barton & Cowan, 2001). The sedimentary rocks of the Gunbarrel Basin include sandstone, glauconitic, marine and continental siliclastic and arenite. The Gunbarrel Basin overlies the Officer Basin, a former marine trough, which comes to the surface in the north-east of the GVD, and includes conglomerate, sandstone and arenite. In the south-west of the GVD where the project area lies, Mesoproterozoic granite, dolerite, gabbro and ultra-basic intrusions, and Archaean gneiss of an outlier of the Biranup Complex occur (Albany-Fraser Province) (Tille, 2006).

The western part of the GVD is underlain by a moderately well developed laterite crust or by ferruginised silcrete. These laterite and silcrete crusts form a resistant caprock broken in places by erosion, which has carved out a typical mesa and butte topography with flat tops and breakaways. Pediments are formed in front of the breakaways and are often covered by a thin veneer of alluvial and colluvial sediments.



Calcareous clay up to 6 m thick covers the majority of the southern section of the corridor. This residual clay overlies the Nullarbor Limestone and contains a layer of grey kankar about 2 m thick. The kankar forms slabs and cobbles, and sometimes crops out as a resistant layer at the top of a low scarp.

2.3 SOILS

Starting in the south, the soils of the Nullarbor central band subregion are essentially shallow calcareous loams and calcareous loamy earths, thinly mantling the massive marine limestones of the Eucla Basin (Barton *et al.*, 2002). There are also some calcareous stony soils scattered throughout this region. The soils of the Coolgardie eastern Goldfields subregion are dominated by calcareous earths which cover much of the plains and greenstone areas. Cowan (2001) describes the soils in the region as calcareous loamy earths and red loamy earths with some salt lake soils, red deep sands, yellow sandy earths, shallow loams and loamy duplexes. The more northern sections of the Corridor in this region are dominated by sand plains which support a vegetation of mallees, acacia thickets and shrub heaths (Cowan, 2001).

Moving north the proposed Corridor passes through the Shield subregion of the Great Victoria Desert. This section of the Corridor is dominated by a higher proportion of sand plains in comparison to the entire bioregion (Barton and Cowan, 2001). Along the southern two thirds of the survey area, which falls within this subregion, the Corridor is dominated by sand plains. Within the northern third the Corridor passes into an arid active sand-ridge desert of deep Quaternary aeolian sands (Barton and Cowan, 2001). Within the Shield subregion the Aeolian sandplains tend to support mallee (*Eucalyptus kingsmillii*, *E. youngiana*) over hummock grassland dominated by *Triodia basedowii*. Scattered marble gum (*E. gongylocarpa*) and native pine (*Callitris*) occur on the deeper sands of the sand plains. Mulga and acacia woodlands occur mainly on the colluvial and residual soils (Barton and Cowan, 2001).

Further north the Corridor passes into the Central GVD subregion. Within this subregion there is a continuation of the arid active sand-ridge desert with extensive dune fields of deep Quaternary aeolian sands (Barton and Cowan, 2001). The aeolian sands of this subregion tend to support a tree steppe of *Eucalyptus gongylocarpa*, mulga and *E. youngiana* over hummock grassland dominated by *Triodia basedowii*. The *Acacia* dominates colluvial soils with *Eremophila* and *Santalum* spp. (Barton and Cowan, 2001).

2.4 BIOGEOGRAPHIC REGIONS AND LANDFORMS

The Interim Biogeographic Regionalisation for Australia categorises the Australian continent into regions defined on the basis of geology, landforms, vegetation, fauna and climate (IBRA, 2000). The Corridor spans four subregions of the Great Victoria Desert, Coolgardie and Nullarbor bioregions (Figure 2.2). At the northern end, close to Tropicana camp, the Corridor runs through the Central subregion of the Great Victoria Desert bioregion (GVD2), the middle section through the Shield subregion of the same bioregion (GVD1), and the southern section of the Corridor through the eastern border of the Eastern Goldfields subregion of the Coolgardie bioregion (COO3), and extends into the Nullarbor Central Band subregion (NUL2) of the Nullarbor bioregion.

Overall, the Great Victoria Desert bioregion is dominated by longitudinal sand dunes with a predominant east-west orientation and ring dunes separated by interdune corridors and sand plains (van de Graff and Bunting, 1977). These sand plains have elevations of between 300-500 m AHD (Australian Height Datum).

The Central subregion of the Great Victoria Desert is described by Barton and Cowan (2001) as an arid active sand ridge desert with extensive dune fields of deep Quaternary



aeolian sands overlying Permian strata of the Gunbarrel Basin. Landforms consist of salt lakes and major valley floors with lake derived dunes, sand plains with extensive seif dunes running east west, occasional outcropping (breakaways) and quartzite hills provide minor relief. Vegetation is primarily a tree steppe of *Eucalyptus gongylocarpa*, *Acacia aneura* and *E. youngiana* over hummock grassland dominated by *Triodia basedowii* on the aeolian sands. *Acacia* dominates colluvial soils along with *Eremophila* and *Santalum* spp., while halophytes are confined to edges of salt lakes and saline drainage systems.

The Shield subregion of the Great Victoria Desert is described by Barton and Cowan (2001) as the western end of the GVD region and is underlain by the Yilgarn Craton and has the highest proportion of sandplains in the bioregion. Landforms consist of salt lakes and major valley floors with lake derived dunes, sand plains with patches of seif dunes running east west, areas of moderate relief with out-cropping and silcrete-capped mesas and plateaus (breakaways). A tree steppe of *Eucalyptus gongylocarpa*, spinifex (*Triodia* spp) and mallee (*Eucalyptus kingsmillii*, *E. youngiana*) over hummock grassland dominated by *Triodia basedowii* occur on aeolian sands, with *Acacia*, mulga and *Eremophila* and *Santalum* spp. occurring on the colluvial and residual soils. Scattered marble gum (*E. gongylocarpa*) and native pine (*Callitris*) occur on the deeper sands of the sand plains. Halophytes such as salt bush (*Atriplex*), bluebush (*Kochia*), and samphire (*Arthrocnemum*) occur on margins of salt lakes and in saline drainage areas.

The Eastern Goldfields subregion (COO3) of the Coolgardie bioregion is described by Cowan (2001) as lying on the Yilgarn Craton's Eastern Goldfields Terrains. The relief is subdued and comprised of gently undulating plains interrupted in the east by a horst of Proterozoic basic granulite. Scattered exposures of bedrock display the underlying geology of gneisses and granites which have been eroded into a flat plane. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas. The vegetation is mallees, *Acacia* thickets and shrub-heaths on sandplains. Diverse *Eucalyptus* woodlands occur around salt lakes, on ranges, and in valleys. Salt lakes support dwarf shrublands of samphire. The area is rich in endemic *Acacias*.

The Nullarbor Central Band subregion (NUL2) of the Nullarbor bioregion is described by Barton *et al.* (2002) as a tertiary limestone plain with subdued arid karst features. The subregion is dominated by the Nullarbor Plain, which is wholly contained within the much larger Bunda Plateau. The plateau displays small scale relief in the patterns of clay-filled depressions that alternate with rises of thin stony soils or bare limestone. It supports a bluebush-saltbush steppe in central areas; low woodlands of *Acacia papyrocarpa* (western myall) over *Maireana sedifolia* (bluebush) are present in peripheral areas, including *Myoporum platycarpum* and *Eucalyptus oleosa* in the east and west.

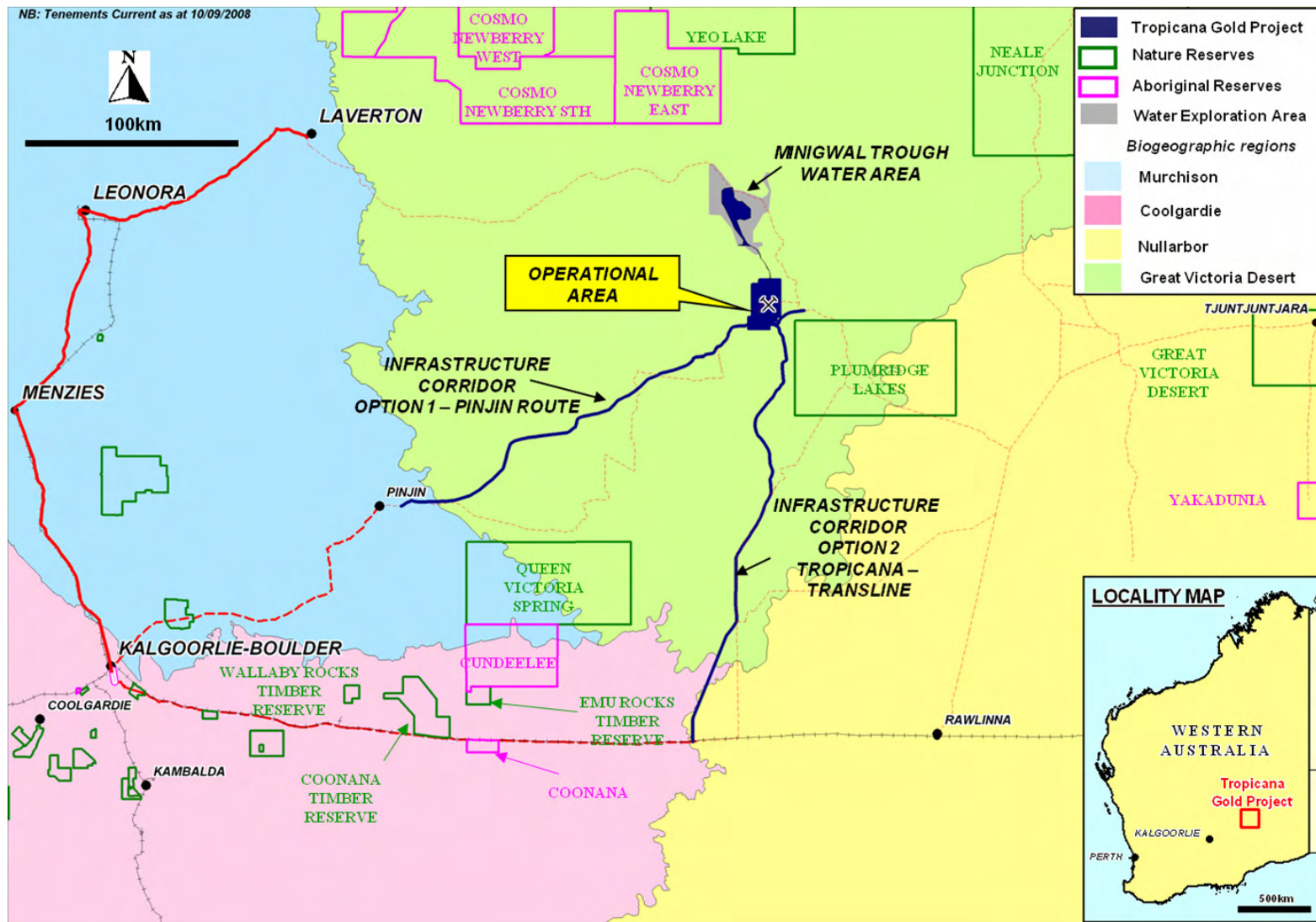


Figure 2.2: Route of the Corridor through IBRA 6.1 regions (option 2)



2.5 VEGETATION COMMUNITIES

The study area spans three of Beard's (1975) Botanical Districts (Figure 2.3). Most of the Corridor (middle and northern sections) is situated in the Helms Botanical District within the Eremaean Botanical Province. The southern-most section is situated on the boundary of the Eucla Botanical District (Nyanga Plain) of the Eremaean Botanical Province and the Coolgardie Botanical District of the South-western Interzone.

Beard (1975) described six distinct vegetation units in the Corridor, these were:

Northern section

Tree (*Eucalyptus gongylocarpa*, *E. youngiana*) and shrub steppe between sand hills with hummock grassland (*Triodia basedowii*) (e₁₉ Lr. E₂₀ Sr. t₂ Hi).

Acacia aneura (mulga) low woodland between sand ridges (A₁ Li).

Acacia aneura / *Casuarina cristata* (*C. pauper*) woodland (mulga and sheoak) (A₁ C₂ Li.).

Middle section

Tree (*Eucalyptus gongylocarpa*, *E. youngiana*) and scattered *Acacia aneura* shrub steppe on sandplain with hummock grassland (*Triodia basedowii*) (e₁₉ Lr. E₂₀ Sr. t₂ Hi).

Southern section

Mosaic of *Eucalyptus oleosa* (mallee) and *Triodia scariosa* with patches of *Eucalyptus salmonophloia* and *Eucalyptus salubris* (gimlet) woodland (E₂₂ Sr. t₈ Hi/eMi).

Acacia aneura / *Casuarina cristata* (*C. pauper*) / *Myoporum* and *Atriplex* (saltbush) or *Kochia* (bluebush) thickly wooded succulent steppe (A₁ C₂ Li. K₁ K₂ M Ci).



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3.0 Survey Methods

3.1 SURVEY TIMING

The survey was carried out between the 13th and 23rd of July, 2007 and the 20th and 24th of August 2007.

3.2 SITE SELECTION

Quadrat sites were chosen on the basis of topography, interpretation and ground truthing of aerial photographs and field observations of vegetation structure, floristics and condition. The number of sites established was determined by the size and the heterogeneity of the study area and the time allowed for the survey.

3.3 SAMPLING METHODS

The survey methods used were developed to meet the Environmental Protection Authority's Guidance Statement 51 (Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia).

The survey combined the following methods:

Detailed site/association assessments by sampling 20 m x 20 m quadrats, less detailed assessments along levees/transects of variable length, and broad-scale vegetation mapping.

3.4 FLORISTIC SURVEY SITES

The floristic field survey involved systematic flora sampling in quadrats approximately 20 m by 20 m, or of an equivalent area of 400 m² in sites that were less than 20 m wide. These quadrats provide the information needed to accurately map the small-scale vegetation units and allow a comprehensive floristic inventory of the survey area to be generated.

In addition, transects were walked through representative stretches of vegetation to provide more information on vegetation units occurring along the Corridor and also to ensure that a comprehensive species list was collated for the extensive study area. Opportunistic collections of any species not already collected were also made by the botanists when walking from site to site.

One hundred and fourteen 20 m x 20 m quadrats were assessed during the survey along with 59 transects of variable length (Figures 3.1 and 3.2, Tables A.1 and A.2, Appendix A).

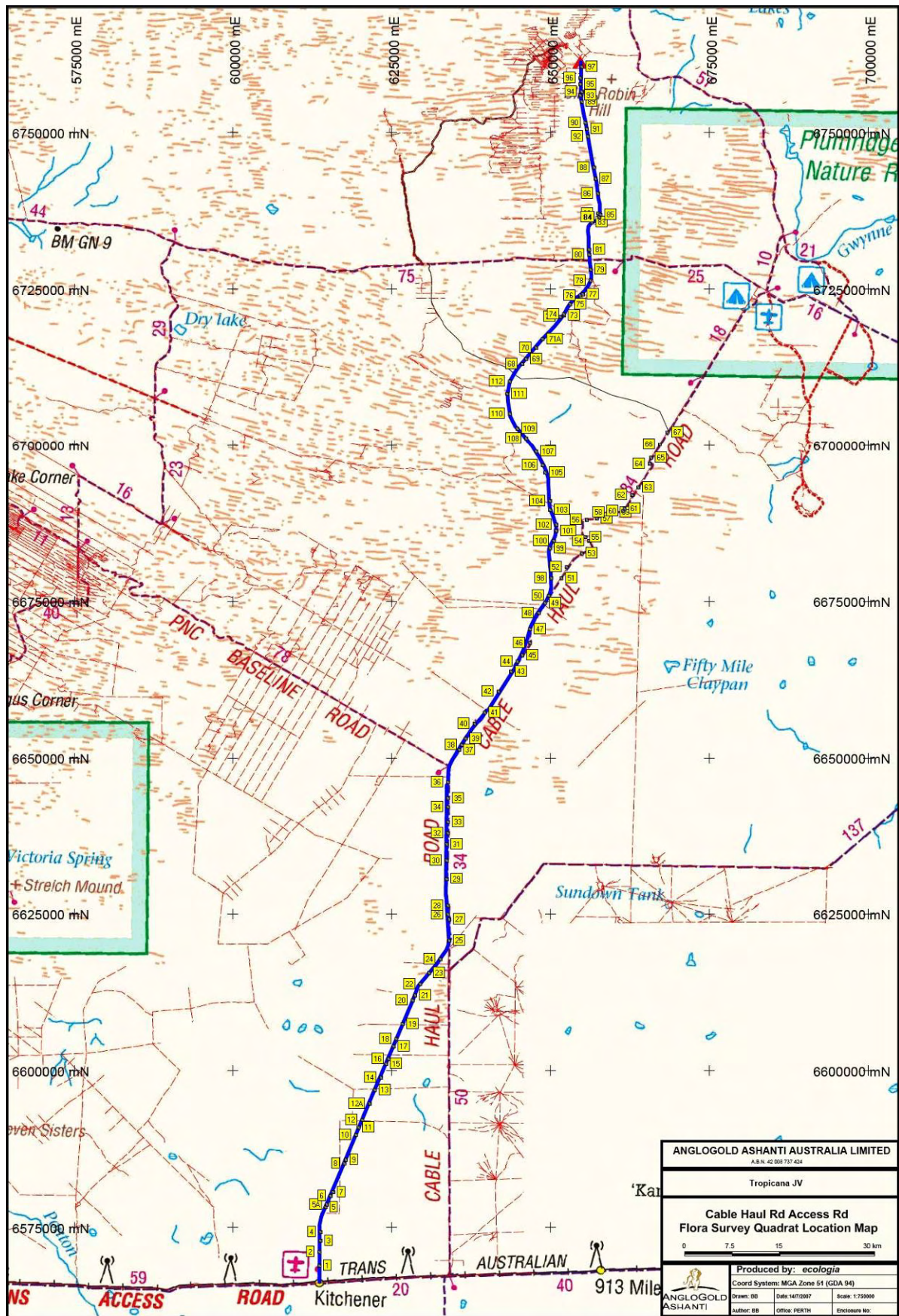


Figure 3.1: Flora quadrat survey sites along the Corridor

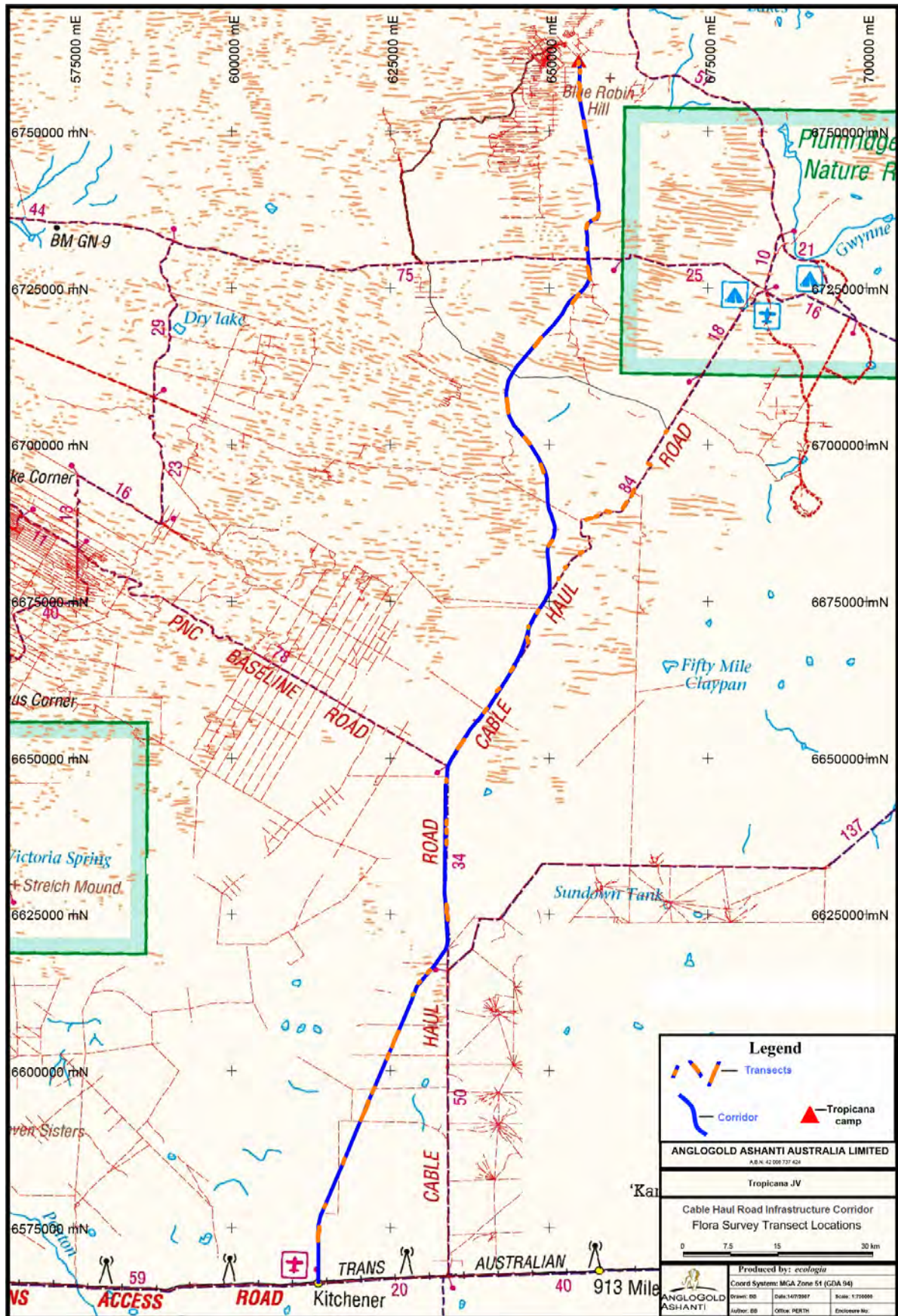


Figure 3.2: Transects surveyed along the corridor (orange lines)



3.5 SURVEY LIMITATIONS AND CONSTRAINTS

According to the Environmental Protection Authority (EPA) Guidance Statement for Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA, 2004a), flora and vegetation surveys may be limited by the following:

- scope (i.e. the influence in terms of reference, such as what life forms etc. were sampled);
- proportion of flora collected and identified (based on sampling, timing and intensity);
- sources of information (i.e. pre-existing background versus new material);
- the proportion of the task achieved and further work which might be needed;
- timing/weather/season/cycle;
- disturbances (e.g. fire, flood, accidental human intervention etc.);
- intensity (in retrospect, was the intensity adequate?);
- completeness (e.g. was the relevant area fully surveyed?);
- resources (e.g. degree of expertise available in plant identification to taxon level);
- access problems;
- availability of contextual information; and
- experience levels.

These potential constraints and comments on their relevance to this survey are presented in Table 3.1.

Table 3.1: Flora survey constraints and their relevance to the survey

Aspect	Constraint?	Comment
Scope	No	The scope was confined to a Level 1 flora and vegetation survey with an emphasis on compiling a preliminary inventory of flora species and a search for Declared Rare Flora (DRF) and Priority Flora at defined sites along the approximately 215 km long corridor. One hundred and fourteen (400 m ²) survey quadrats (45, 600 m ²) and 59 transects were surveyed along the 200 m wide corridor.
Proportion of flora identified, recorded and/or collected	No	The current survey recorded a total of 417 flora taxa and 89% of these were determined to species or sub-species level. Fourteen Priority flora vouchers are to be lodged with the WA Herbarium and one voucher for a species of conservation interest. More than 1500 collections were made during the survey.
Sources of information e.g. previously available information (whether historic or recent) vs new data	Negligible	Apart from the <i>ecologia</i> flora and vegetation surveys conducted previously in the Plumridge Lakes NR and within the Tropicana Joint Venture project area in the vicinity of the Tropicana Camp (see section 1.2 for details) little other information is available on the area. A number of opportunistic flora collection records are available on WA Herbarium records (2008) for the area and these are mainly old records of the Helms expedition and collections by Pearson and AS George (see Section 2.6 for details).



Aspect	Constraint?	Comment
The proportion of the task achieved and further work which might be needed	Negligible	The length of the proposed Corridor was surveyed.
Timing/weather/season/cycle	Negligible	The survey was conducted in July/August at the coldest time of the year after low to average summer/autumn rains. Very few species were in flower. Annuals and geophytes were rare.
Disturbances which affected results of survey	Negligible	Approximately 20% - 30% of the vegetation of the Corridor had been burnt either recently or within 5 years of the time of the survey. However, most vegetation was able to be identified in the vegetative state as the field taxonomist had 3 years' experience of the flora of the Tropicana area. In other areas, the vegetation had not been burnt for a long time (at least more than 5 years before the survey) and species richness was low. In these areas some species would not have been evident due to the fire cycle.
Intensity (in retrospect, was the intensity adequate?)	No	Given the logistics and economics involved with a survey of this type, the intensity was appropriate for a Level 1 survey. One hundred and fourteen quadrats and 59 transects were surveyed along the approximately 215 km of the proposed Corridor.
Completeness	Negligible	Most vegetation types were surveyed and there was adequate replication of sites in each.
Resources	No	Resources were adequate for the survey with 50 person days invested in the botanical survey work (excluding mobilisation days).
Remoteness and/or access problems	Negligible	The section of the proposed route about 20 km north of the Link Road was not as readily accessible as other sections, as there were no tracks and the vegetation was very dense.
Availability of contextual (e.g. biogeographic) information on the region	Moderate	This is a largely unexplored region in terms of flora and vegetation and this survey and the previous <i>ecologia</i> surveys (as listed above) are establishing the baseline database for the area.
Competency/experience of the consultant carrying out the survey	No	Cate Tauss is a botanist with approximately 15 years plant ecology and taxonomy experience (including 4 years employment at the WA Herbarium). She identified collections from each <i>ecologia</i> project carried out in the Bioregion for 3 years and has conducted additional scientific level research and fieldwork in the area. Jeremy Naaykens, Caroline McCormick and Melissa Hay are experienced field botanists and have had appropriate training, experience and mentoring in flora survey procedures and methodology.

3.6 DATA ANALYSIS

Vegetation mapping is the delineation of plant communities into groups or associations. The distinctive characteristics that these groups or associations share include features such as species dominance, stratum structure and species composition (Hedde *et al.*, 1980). Data collected from quadrats assessed along the main alignment of the Corridor was analysed using the multivariate programme SYSTAT™, with Pearson complete linkage analysis to produce dendrograms showing the similarities between sites. This method



provides an objective means of mapping in order to define the boundaries between vegetation types. Density data provided greater resolution of vegetation communities and this was used for the mapping exercise. The associations were plotted using 1:10 000 aerial photography to define their boundaries.

3.7 SURVEY TEAM

The vegetation and flora survey described in this document was planned, coordinated and executed by:



ecologia Environment
1025 Wellington Street
WEST PERTH
WA 6005

Project Staff		
Christina Cox	PhD	Project Manager
Cate Tauss	BSc. Grad. Dip. Sc. (Bot)	Senior Botanist/ Field Taxonomist
Jeremy Naaykens	BSc. (Hons)	Botanist
Caroline McCormick	BSc. (Hons)	Botanist
Melissa Hay	BSc. (Hons)	Botanist
Peter Jobson	MSc.	Senior Plant Taxonomist
Conrad Slee	BSc.	Plant Taxonomist

Licences - "Licence to take flora for scientific purposes"		
This survey was conducted under the authorisation of the following licences issued by the Department of Environment and Conservation:		
	Permit Number	Valid Until
Cate Tauss	SL007246	5 th October 2007
Jeremy Naaykens	SL007795	30 th April 2008
Caroline McCormick	SL007817	30 th April 2008
Melissa Hay	SL007712	21 st December 2007



4.0 Results

4.1 FLORA

Four hundred and seventeen flora taxa were recorded along the Corridor including subspecies, varieties, forms and affinities (Appendix B). The taxa comprised 52 families, 142 genera and 372 confirmed species. Due to a lack of reproductive material, two of the specimens were identified to family only, 10 to genus only, one to a query genus and 32 to queried species. One specimen could not be identified.

The incompletely identified collections were further analysed relative to other taxa from the relevant genera in eliminate, as far as feasible given the lack of reproductive material, the possibility of any of these taxa being Declared Rare or Priority taxa. This analysis is detailed in Appendix K.

The most species rich plant families were:

- Myrtaceae (43 confirmed species),
- Mimosaceae (34 confirmed species),
- Poaceae (29 confirmed species),
- Chenopodiaceae (26 confirmed species) and
- Myoporaceae (25 confirmed species).

The most species rich genera were *Acacia* (34 confirmed species), *Eucalyptus* (29 confirmed species) and *Eremophila* (24 confirmed species): 19 families and 83 genera were represented by a single taxon.

Given the limited amount of survey work that has been carried out in the survey area, information has been included on the current distribution of each of the taxa in the species list in Appendix B. Four bioregions (GVD, Great Victoria Desert; COO, Coolgardie; NUL, Nullarbor; and, MUR, Murchison) were checked for the occurrence of each species on the list and their occurrence has been indicated in the species list. Where no records exist for taxa in these bioregions they have been noted as being range extensions.

4.2 FLORA OF CONSERVATION SIGNIFICANCE

4.2.1 Results of Database Searches

A search of the Department of the Environment, Water, Heritage and Arts database for flora species protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed one threatened flora species as possibly occurring within a 50 km buffer of the Corridor; *Conospermum toddii* (Victoria Desert Smokebush), which is listed as endangered.

Searches of the DEC Threatened (Declared Rare) Flora database, the Western Australian Herbarium (WAHERB) specimen database, the DEC Declared Rare and Priority Flora List (DR&P) and the Threatened Ecological Communities (TEC) database for flora protected by Western Australian legislation were requested. A rectangle surrounding and including the Corridor was searched (coordinates 29°16'S, 124°04'E (NW corner) and 31°00'S, 125°02'E (SE corner)).

Based on the results of the WAHERB and DR&P database searches requested before the survey, one Declared Rare and 16 Priority Flora taxa are currently known from locations in the immediate vicinity of the Corridor and in the surrounding areas (Table 4.1). No TECs are listed as occurring in the project area. However, one recently listed priority ecological community (PEC) – the Yellow sandplain communities of the Great Victoria Desert – (a



Priority 3(ii) PEC) - occurs to the west of the Corridor. Explanation of conservation codes are located in Appendix C.

Table 4.1: Declared Rare and Priority Flora species known to occur within (WAHERB) or in areas surrounding (DR&P) the Corridor

Species	Areas Recorded At	Conservation Codes*	Database
<i>Conospermum toddii</i>	Central W of Plumridge Lakes Nature Reserve	R	WAHERB, DR&P
<i>Baeckea</i> sp. Sandstone	92.3 km and 115 km (NNE) past intersection with the PNC (Officer Basin) track and abandoned camp	1	WAHERB
<i>Dampiera eriantha</i>	Victoria Desert Camp 54; W area of Plumridge Lakes Nature Reserve	1	WAHERB, DR&P
<i>Labichea deserticola</i>	Great Victoria Desert (GVD)	1	DR&P
<i>Baeckea</i> sp. Great Victoria Desert	Streitch Mound, Queen Victoria Spring NR, Officer Basin, GVD.	2	DR&P
<i>Dicrastylis nicholasii</i>	41 km N of Trans-Aust-railway on western boundary fence of Kananda Station, Naretha 1	2	WAHERB
<i>Malleostemon</i> sp. Officer Basin	25 km S of Tropicana Exploration area/ 20 km NW of Cable Haul Road	2	WAHERB
<i>Olearia arida</i>	35 km W of Plumridge Lakes	2	WAHERB, DR&P
<i>Physopsis chrysotricha</i>	Victoria Desert (Camp LIV) [Camp 54]	2	WAHERB
<i>Acacia eremophila</i> numerous-nerved variant	20 km WNW along track from S end of Plumridge Lakes	3	WAHERB, DR&P
<i>Eucalyptus pimpiniana</i>	Lake Minigwal, GVD	3	DR&P
<i>Melaleuca nanophylla</i>	GVD	3	DR&P
<i>Microcorys macredieana</i>	SW part of Plumridge Lakes Nature Reserve	3	WAHERB
<i>Micromyrtus stenocalyx</i>	PNC Road, 35.4 km W of the Cable Haul Road; 95 km NW of Connie Sue Highway in Plumridge Lakes Nature Reserve	3	WAHERB
<i>Comesperma viscidulum</i>	Queen Victoria Spring, Little Sandy Desert, Carnarvon Range, GVD	4	DR&P
<i>Daviesia purpurascens</i>	GVD, Kondinin, Hyden, Bending, Dragon Rocks	4	DR&P
<i>Lepidobolus deserti</i>	In SW part of Plumridge Lakes Nature Reserve	4	WAHERB

Conservation codes 1, 2, 3 and 4 denote Priority levels and R signifies Declared Rare Flora; these are as in the database search results.



4.2.2 Conservation significant flora recorded during the Corridor survey

Environment Protection and Biodiversity Conservation Act 1999

Flora species are protected at a National level under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Act contains a list of species that are considered Critically Endangered, Endangered, Vulnerable, Conservation Dependent, Extinct or Extinct in the Wild (Appendix C).

One threatened flora species (*Conospermum toddii* F.Muell, Endangered) is listed as possibly occurring in the Tropicana area; however, it was not located during the survey.

Wildlife Conservation Act 1950

Conservation significance is determined under the *Wildlife Conservation Act 1950*; under this Act, flora of conservation significance is protected. Declared Rare Flora (DRF) is also protected under the *Western Australian Wildlife Conservation (Rare Flora) Notice 2008(2)* of the above Act. This notice lists flora taxa that are extant and considered likely to become extinct or rare. They are defined as “taxa which have been adequately searched for and deemed to be either rare, in danger of extinction, or otherwise in need of special protection in the wild”. These taxa are legally protected and removal or impact to their surroundings cannot be conducted without ministerial approval obtained specifically on each occasion for each population. *Eucalyptus articulata*, *Thryptomene wittweri* and *Conospermum toddii* are listed as occurring in the Great Victoria Desert bioregion and are protected by this Act.

None of these Declared Rare Flora taxa were recorded during the survey.

The Department of Environment and Conservation (DEC) also maintains a list of Priority Flora taxa, which are considered poorly known, uncommon, or under threat, but for which there is insufficient justification based on known distribution and population sizes for inclusion on the DRF schedule. Priority Flora taxa are assigned to one of four Priority categories as defined in Appendix C.

Thirty-seven Priority Flora species are known from the Great Victoria Desert, 242 from Coolgardie, and 14 from the Nullarbor (Western Australian Herbarium, FloraBase, January 2008). The listings for the Great Victoria Desert (within which most of the Corridor is located) are presented in Appendix D.

Fourteen Priority Flora species were recorded during the surveys and these are discussed in the following paragraphs. Their exact and approximate locations are listed and shown in the Table and Figures of Appendix E.

***Dampiera eriantha* (Priority 1)** is an erect perennial herb growing to 0.6 m in height (no photograph available). It is typically found in yellow sand on dunes and was recorded at five locations during the survey – at two quadrats, along one transect and twice opportunistically.

***Baeckea* sp. Great Victoria Desert (A.S. Weston 14813) (Priority 2)** is a shrub that grows to 1 m in height. The stems tend to be sparse with a limited number of small branches. It has small leaves that occur in groups along the sides of the stem. The flowers are small and pink to white, and can often be seen in the months after good rainfall from April to June (Plate 4.1). The leaves are dark yellowish-green, small and tuberculate. Habits recorded from previous collections include red sand, yellow sandy loam and gentle slopes and undulating plains. Within the Tropicana Lease it has been collected at numerous locations where it provides a sparse to open cover. *B. sp.* Great Victoria Desert was recorded 13 times during the survey – at seven quadrats, along five transects and once opportunistically.



Plate 4.1: *Baeckea* sp. Great Victoria Desert (Photo – ecologia)

***Dicrastylis nicholasii* (Priority 2)** is an upright shrub growing to about 0.6m in height, and has stems that have a grey, woolly appearance (Plate 4.2). The blue flowers occur in groups at the end of branching stems. The species has been recorded as flowering in January and April, but it possibly also flowers at other times of the year in response to good rainfall. It is often located on red, sandy loam soils on flat to slightly undulating plains in association with mallee, shrubs and spinifex. Within the Tropicana Lease this taxon is widespread and abundant, occurring across a broad range of vegetation types and with a total population numbering in the thousands. *D. nicholasii* was recorded 43 times – at 19 quadrats, along 11 transects and nine times opportunistically.



Plate 4.2: *Dicrastylis nicholasii* (Photo – ecologia)

***Grevillea secunda* (Priority 2)** is a low, spreading shrub that grows between 0.3 m to 0.8 m in height and it usually flowers between September and October. The flowers are red (Plate 4.3) and arranged in groups at the ends of the horizontal stems, and the fruits have thin, woody shells. The species has large, coarsely-divided prickly leaves and this feature, along with its habit of spreading almost horizontally just above the ground, distinguishes it from most other similar species growing in the Tropicana area. Commonly occurs on yellow or red sand dunes or in undulating sandplain environments. This species can often be found distributed sparsely but widespread in vegetation of the Tropicana area. *G. secunda* was recorded 15 times during the survey – at seven quadrats, along four transects and four times opportunistically.



Plate 4.3: *Grevillea secunda* (Photo: ecologia)

***Isotropis canescens* (Priority 2)** is a prostrate perennial herb that grows to 0.3 m in height (no photograph available). The flowers are yellow or red and are produced in August. This species is found to grow on sandplains of yellow clayey sand. *I. canescens* was recorded once during the survey – along one transect.

***Malleostemon* sp. Officer Basin (Priority 2)** is a shrub that grows to 1 m in height in open woodland but possibly up to 3 m in tall shrubland (Plate 4.4). This species has small and almost round leaves that are close to the stem and arranged in overlapping rows. The stems have an open to sparse arrangement. It occurs on the crests or slopes of yellow sand dunes. A very restricted species in its known distribution and has been recorded only a limited number of times. During this survey it was recorded at two quadrats.



Plate 4.4: *Malleostemon* sp. Officer Basin (Photo – ecologia)

***Olearia arida* or Arid Daisybush (Priority 2)** is a low shrub that grows up to 0.7 m in height (Plate 4.5). This species has sparsely branched stems and young stems that are stiff and sticky with short white hairs. The narrow leaves are up to 2 cm in length, smooth and hairless on the top and white with a green vein on the underside. At flowering time (July to September), a single white daisy head about 2 cm in diameter is produced at the end of each stem. *Olearia arida* usually occurs on undulating low rises of red or yellow sand



(Paczkowska and Chapman, 2000). During this survey *O. arida* was recorded 16 times – at two quadrats, along seven transects and seven times opportunistically.



Plate 4.5: *Olearia arida* (Photo – ecologia)

***Physopsis chrysostricha* (Priority 2)** is a shrub that produces yellow or white flowers during September (no photograph available). *P. chrysostricha* was recorded three times during the survey – at one quadrat and twice opportunistically.

***Dicrastylis cundeeleensis* (Priority 3)** is a woolly shrub that grows from 0.2 to 0.5 m in height (no photograph available). The flowers are white and this species is recorded as flowering in April and from October to December. It is often located on sandplains of yellow sand, red or reddish-yellow sand. *D. cundeeleensis* was recorded 14 times during the survey – at seven quadrats and along seven transects.

***Microcorys macredieana* (Priority 3)** is a wispy, broom-like low shrub in the mint family that grows to between 0.2 and 1.5 m in height (Plate 4.6). It has narrow, aromatic leaves that grow in groups of three from the stem, and each leaf has a slight hook at its tip. The plant has unevenly shaped white flowers. It is conspicuous in unburnt vegetation at Tropicana due to the lush, light green colour of its leaves and stems, which differs from the mostly dark or dull coloured plants in the area. The plants grow in yellow sand on dunes and plains and are often found growing in small groups. This species was recorded growing in low *Eucalyptus* woodland at several locations in the Tropicana project area. This species was recorded 15 times during the survey – at five quadrats, along three transects and seven times opportunistically.



Plate 4.6: *Microcorys macredieana* (Photo – ecologia)

***Micromyrtus stenocalyx* (Priority 3)**, or Wispy Desert Myrtle, is a very slender shrub with miniscule, narrow leaves that lie close to the stem and tiny, short tube-like creamy - yellow flowers (Plate 4.7) that are produced between April and December; the petals are about 1 mm wide. It grows to about 1.5 m in height. *M. stenocalyx* was recorded three times during the survey – at two sites and along one transect.



Plate 4.7: *Micromyrtus stenocalyx* (Photo – ecologia)

***Comesperma viscidulum* (Priority 4)** or Viscid Milkwort of the family Polygalaceae, is an upright shrub growing to between 0.5 to 1.0 m in height (no photograph available). The stems and leaves are covered with a yellow sticky resin. The pea-like flowers are light yellow to white with a tinge of purple near the centre. The leaves are usually densely arranged on the stems, relatively firm, leathery in texture, non hairy and hooked outwards at the tips. Often found growing in red sand on dunes or yellow to orange undulating sand plains with sparse *Eucalyptus* woodlands and/or mallee. *C. viscidulum* was recorded along two transects during the survey.

***Daviesia purpurascens* (Priority 4)** or Purple-leaved Daviesia is a prickly erect shrub that grows from 0.2 to 1 m in height (Plate 4.8). The flowers are yellow, red, or brown and are produced in October. The stems and leaf-like parts of this species are a blue-green to grey colour, round in cross section, and very spiny. This species grows on sandy or loamy soils



over laterite on flats or ridges. In the Tropicana area it has been found growing in small patches in *Eucalyptus* woodland areas. During this survey it was recorded seven times – along three transects and four times opportunistically.



Plate 4.8: *Daviesia purpurascens* (Photo - S.D. Hopper)

Photography by S.D. Hopper. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (<http://florabase.dec.wa.gov.au/help/copyright>). Accessed on Monday 9 June 2008.

Lepidobolus deserti or Desert Twine Rush (**Priority 4**) is a rhizomatous, caespitose perennial herb between 0.15 and 0.45 m in height (Paczkowska and Chapman, 2000). This sedge-like herb grows in tufts and has wiry leafless stems that twist and curl back and forth. The short stems have with a number of dark to mid-brown patches at regular spacings. The above-ground stems grow to about 40 cm (but often about 25 cm) in height from an underground horizontal stem. The underground stem is covered with dense, light brown hairs. This species often grows in clumps that are 20 to 40 cm wide. This sedge-like herb (Plate 4.9), usually occurs on yellow or orange sand dunes (Paczkowska and Chapman, 2000). This species occurs in the Tropicana area as sparse but widespread plants in low woodland or with mulga, or among mallee and taller shrubs with spinifex. It tends to be found on flat, red, loamy sand plains. The Tropicana area is the eastern-most distribution of this species, and the plant is regionally significant in addition to being listed as a Priority 1 flora. *L. deserti* was recorded nine times during the survey – at two quadrats, along one transect and four times opportunistically.



Plate 4.9: *Lepidibolus deserti* (Photo – ecologia)

4.2.3 Flora of potential conservation significance recorded during the Corridor survey

Two species of potential conservation significance were recorded during the surveys and are discussed below. Their approximate locations are detailed in Appendix E.

***Caesia talingka* ms** (of potential conservation significance) is a sedge-like rhizomatous, tufted perennial herb. It forms a thick, dark green grass-like clump up to 50 cm high and about 70 cm in diameter (Plate 4.10). It has folded, viscid (sticky) leaves. It is much like *C. rigidifolia* (Priority 1) except that the plants are larger and the leaves are folded. During the survey *C. talingka* was recorded five times – at one quadrat, along two transects and twice opportunistically.

Note: This taxon has now been recognised as *Caesia talingka* C Tauss ms by the Western Australian Herbarium within the Census of Western Australian Plants, although it is yet to be uploaded within FloraBase. It is synonymous with *C. sp.* Great Victoria Desert. This group of *Caesias* are currently under review and it is possible that this taxon could be listed as a Priority Flora taxon in the future.



Plate 4.10: *Caesia talingka* (Photo – ecologia)

***Eremophila ?undulata* (Priority 2).** *E. undulata* is a small spreading shrub, growing to 0.5 m in height (Plate 4.11). The branches and leaves are covered in long white branched hairs. Greenish-brown to yellowish-green flowers are produced from July to September. It occurs in red-brown sandy clay loams in mallee woodlands, commonly under trees, and in open locations in hummock grassland. A single collection potentially of this taxon was recorded but could not be unequivocally identified due to insufficient material.



Plate 4.11: *Eremophila undulata* (Photo – C. Hortin & J. Hooper)

Photography by C. Hortin & J. Hooper. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (<http://florabase.dec.wa.gov.au/help/copyright>). Accessed on Wednesday, 8 July 2009.

In addition to the Priority taxa and species of potential conservation interest discussed above, four confirmed taxa with marked range extensions were recorded during the survey - *Allocasuarina campestris*, *Adriana urticoides* var. *hookeri*, *Eucalyptus intertexta* and *Swainsona colutooides* - and two others where the species could not be confirmed – *Psyrax ?ammophila* and *Solanum ?chippendalei* but if confirmed would represent large range extensions.

Eight flora surveys have been carried out by ecologia Environment at or close to the TJV project area. One confirmed Declared Rare Flora and 12 confirmed Priority Flora species have been recorded during these surveys (ecologia 2005a, ecologia 2005b; 2006a, 2006b, 2006c; 2008a, 2008b, 2009a in prep.) as detailed in Table 4.2.



Table 4.2: Declared Rare and Priority Flora recorded in previous surveys at or in the vicinity of the Tropicana JV project area (including Plumridge Lakes)

Taxon	Family	Reference:	Cons. Status
<i>Conospermum toddii</i>	Proteaceae	<i>ecologia</i> 2006b; 2008a; 2009a	DRF
<i>Eucalyptus ?articulata</i>	Myrtaceae	<i>ecologia</i> 2005a	DRF
<i>Caesia rigidifolia</i> (but now confirmed as <i>Caesia talingkams</i> that currently has no priority rank)	Anthericaceae	<i>ecologia</i> 2005b; 2009a	P1 (-)
<i>Thysanotus baueri</i>	Anthericaceae	<i>ecologia</i> 2005a	P1
<i>Baeckea</i> sp. Sandstone (C.A. Gardner s.n.26/10/1963)	Myrtaceae	<i>ecologia</i> 2006a; 2009a	P1
<i>Baeckea</i> sp. Great Victoria Desert (A.S.Weston 14813)	Myrtaceae	<i>ecologia</i> 2005a; 2008a, 2008b	P2
<i>Dicrastylis nicholasii</i>	Lamiaceae	<i>ecologia</i> 2006b, 2006c; 2008a, 2008b, 2009a	P2
<i>Grevillea secunda</i>	Proteaceae	<i>ecologia</i> 2005a; 2006a, 2006b; 2009a	P2
<i>Isotropis ?canescens</i>	Papilionaceae	<i>ecologia</i> 2005a	P2
<i>Olearia arida</i>	Asteraceae	<i>ecologia</i> 2005b; 2006a, 2006b, 2006c; 2008a, 2009a	P2
<i>Acacia eremophila</i> var. <i>variabilis</i>	Mimosaceae	2009a	P3
<i>Acacia eremophila</i> -numerous-nerved variant	Mimosaceae	2009a	P3
<i>Micromyrtus stenocalyx</i>	Myrtaceae	<i>ecologia</i> 2005b; 2006a, 2006b; 2008a, 2009a	P3
<i>Microcorys macredieana</i>	Lamiaceae	<i>ecologia</i> 2006a, 2006b; 2008a, 2009a	P3
<i>Comesperma viscidulum</i>	Polygalaceae	<i>ecologia</i> 2006a	P4
? <i>Daviesia purpurascens</i>	Papilionaceae	<i>ecologia</i> 2006a, 2006b	P4
<i>Lepidobolus deserti</i>	Restionaceae	<i>ecologia</i> 2005b; 2006a, 2006b, 2006c; 2008a, 2009a	P4

The relatively large number of Priority species recorded within the area may be a result of two factors; the paucity of botanical survey work conducted in the area, and the limited representation of the vegetation complexes within the region.

4.3 INTRODUCED FLORA

Weeds that are, or have the potential to become, pests to agriculture can formally be declared under the *Agriculture and Related Resources Protection Act, 1976*. Declared weeds listed under the Act are listed with a coded definition of the requirements for their control. Five Priority groupings are used, and more than one Priority may be placed on a weed species (refer to Appendix C for codes).

A search was conducted of the list of Declared Plants under the ARRP Act, 1976 for any declared weed species that potentially could be found within the Corridor. Eighty one species of plants are listed as declared for the towns of Kalgoorlie-Boulder and Laverton, the nearest named locations to the project area (Department of Agriculture and Food, 2008). A search of the WA Herbarium database for declared weeds occurring in the vicinity of the Corridor identified three species (Table 4.3).



Table 4.3: Declared Weeds found within 100 km of the Corridor

Declared plant	Location	Status
* <i>Echium plantagineum</i> Paterson's Curse	5.2 km west of Zanthus on Trans-Australia railway; near railway 12 km west of Rawlinna	P1
* <i>Proboscidea louisianica</i> Purple Flower Devil's Claw	Queen Victoria Spring Nature Reserve	P1, P2
* <i>Carthamus lanatus</i> Saffron Thistle	5 km north-east of Rawlinna	P4

No declared weeds were recorded during the survey.

Three environmental weeds were recorded during an earlier survey at the TGP area (*ecologia*, 2008 in preparation); **Spergularia rubra* (Sand Spurry), *Sonchus oleraceus* (Sowthistle) and *Erodium aureum* (no common name).

One environmental weed was recorded during this Corridor survey - **Carrichtera annua*. **C. annua* (Ward's weed) is an annual herb growing up to 40 cm. It is covered in bristly hairs and the leaves are very finely divided (Plate 4.11). The petals are about 8 mm long, and are yellow with purple veins. The fruit is a silicula, 6-7 mm long, at least half of which is a characteristic spoon-shaped beak. It is a native of the Mediterranean and is now abundant in the Goldfields and Nullarbor shrublands, often dominating mine rehabilitation sites, from Laverton to Eucla (Hussey *et al.*, 1997).



Plate 4.12: **Carrichtera annua* (source: Hussey *et al.*, 1997)



**C. annua* was recorded at three sites, as detailed in Table 4.4 below.

Table 4.4: Locations of the weed, **Carrichtera annua*

Species	Location	Zone	Easting (mE)	Northing (mN)
* <i>Carrichtera annua</i>	1	51J	613668	6568896
	4		613780	6574366
	CT T01 From->		613742	6574360
	CT T01 To->		613743	6575160

Coordinates in WGS84.

4.4 VEGETATION

When mapping such a long, linear corridor, it is likely that some vegetation units will a) not have been sampled in the field or b) not be easily distinguished on the aerial photography. However, all major community types occurring along the main alignment of the corridor (not including the eastern section leading to Plumridge Lakes Nature Reserve) have been described and mapped.

Nine main vegetation units were mapped along the main corridor and these nine units were further divided into 21 vegetation sub-units. The units and sub-units are described in Table 4.5 below and they are shown on the maps and a species by vegetation unit matrix is included as Appendix F. Photographs of the nine main vegetation units are included as Appendix G.



Table 4.5: Vegetation units occurring along the main Tropicana-Transline Infrastructure Corridor

Vegetation Unit	Landform	Vegetation Description
1. Mixed <i>Eucalyptus</i> spp. woodland over hummock grassland (exL.t7t12H)		
These woodlands are broadly distributed on the sandy plains of the survey area. The overstorey is dominated by an open to moderately dense stratum of mallee, and to a lesser extent tree form eucalypts, usually with at least two species co-dominant. The ground cover is dominated by open to moderately dense <i>Triodia desertorum</i> and <i>Triodia tomentosa</i> .		
1A (sites 32, 36, 51, 74, 104, 112)	Sand hills and undulating plains, occasionally flat plains	Open to sparse mixed <i>Eucalyptus youngiana</i> / <i>Eucalyptus trivalva</i> / <i>Eucalyptus ceratocorys</i> / <i>E. gracilis</i> / <i>E. horistes</i> mallee, over open tall <i>Acacia ligulata</i> / <i>Grevillea juncifolia</i> subsp. <i>temulenta</i> / <i>Duboisia hopwoodii</i> / <i>Aluta maisonneuvei</i> subsp. <i>auriculata</i> shrubs, over moderately dense <i>Keraudrenia velutina</i> subsp. <i>elliptica</i> / <i>Acacia helmsiana</i> / <i>Hannafordia bissillii</i> subsp. <i>bissillii</i> / <i>Dicrasyllis nicholasii</i> low shrubs, over moderately dense <i>Triodia desertorum</i> hummock grasses (e _x L.xS.xZ.t ₇ H).
1B (sites 39, 48, 81)	Flat to undulating plains, red/orange soil	Sparse mixed <i>Eucalyptus youngiana</i> / <i>Eucalyptus concinna</i> trees, over sparse to open <i>Acacia ligulata</i> / <i>Grevillea juncifolia</i> subsp. <i>temulenta</i> / <i>Acacia murrayana</i> tall shrubs, over open to moderately dense <i>Keraudrenia velutina</i> subsp. <i>elliptica</i> / <i>Aluta maisonneuvei</i> subsp. <i>auriculata</i> / <i>Acacia helmsiana</i> / <i>Hannafordia bissillii</i> subsp. <i>bissillii</i> / <i>Acacia sibirica</i> , low shrubs over sparse to open mixed <i>Triodia</i> spp. hummock grasses (e ₂₀ e ₇₁ L.xS.xZ.t _x H).
1C (sites 40, 41, 82)	Undulating plains to minor dunes	Open <i>Eucalyptus gongylocarpa</i> mallees, over sparse <i>Acacia aneura</i> / <i>Acacia ligulata</i> / <i>Grevillea juncifolia</i> subsp. <i>temulenta</i> tall shrubs, over open to moderately dense <i>Bertya dimerostigma</i> / <i>Acacia helmsiana</i> / <i>Keraudrenia velutina</i> subsp. <i>elliptica</i> shrubs, over moderately dense <i>Triodia tomentosa</i> hummock grasses (e ₁₉ L.xS.xZ.t ₁₂ H).



Vegetation Unit	Landform	Vegetation Description
2. <i>Callitris preissii</i> tall shrubland (p₂S)		
<p>These shrublands occur mostly along dunes and dune crests within the study area. The overstorey comprises sparse to open mallees of mixed <i>Eucalyptus</i> species, with open <i>Callitris preissii</i> tall shrubs, often with <i>Thryptomene biseriata</i>. The lower shrub stratum has sparse to open <i>Anthotroche pannosa</i>, while hummock grasses and herbs are sparsely distributed.</p>		
<p>2A (sites 23, 71A, 99)</p>	<p>Undulating plains to dunes</p>	<p>Sparse to open <i>Eucalyptus mannensis</i> / <i>Eucalyptus youngiana</i> mallees, over open <i>Callitris preissii</i> / <i>Thryptomene biseriata</i> / <i>Acacia ligulata</i> tall shrubs, over open <i>Anthotroche pannosa</i> / <i>Hakea francisiana</i> shrubs, over sparse to open <i>Triodia tomentosa</i> / <i>Triodia scariosa</i> hummock grasses (e₇₂e₂₀L.p₂th₁S.xZ. t₁₂t₈H).</p>
<p>2B (sites 45, 69, 98, 100)</p>	<p>Flat dune crests / high points to undulating plains</p>	<p>Sparse <i>Eucalyptus gongylocarpa</i> / <i>Eucalyptus youngiana</i> mallees, over open <i>Callitris preissii</i> / <i>Thryptomene biseriata</i> / <i>Acacia ligulata</i> tall shrubs, over open <i>Anthotroche pannosa</i> / <i>Hakea francisiana</i> / <i>Eremophila decipiens</i> subsp. <i>decipiens</i> shrubs, over scattered mixed <i>Triodia</i> spp. hummock grasses (e₁₉e₂₀L.xS.xZ.t_xH).</p>
<p>2DC (sites 70, 77)</p>	<p>Dunes to dune crests</p>	<p>Sparse to open <i>Eucalyptus trivalva</i> / <i>Eucalyptus youngiana</i> mallees, over open <i>Callitris preissii</i> / <i>Thryptomene biseriata</i> / <i>Leptospermum fastigiatum</i> tall shrubs, over sparse <i>Anthotroche pannosa</i> / <i>Microcorys macrediana</i> / <i>Pityrodia loricata</i> shrubs, over scattered <i>Glischrocaryon aureum</i> herbs (e₇₀e₂₀L.xS.xZ).</p>



Vegetation Unit	Landform	Vegetation Description
3. Mixed <i>Eucalyptus</i> woodland over <i>Triodia scariosa</i> hummock grassland (e_xL.t₈H)		
The hummock grasslands characterized by moderately dense to dense <i>Triodia scariosa</i> occur at both the southern and northern ends of the study area. These grasslands are susceptible to fire which can make identification of the unit difficult, especially after recent fire as for sub-unit 3C.		
3A (sites 89, 93, 95, 96, 97)	Flat sandplains	Open <i>Eucalyptus trivalva</i> low trees, over open <i>Acacia aneura</i> tall shrubs, over sparse <i>Ptilotus obovatus</i> var. <i>obovatus</i> / <i>Senna artemisioides</i> / <i>Eremophila glabra</i> shrubs, over dense <i>Triodia scariosa</i> hummock grassland (e ₇₀ L.a ₁ S.xZ.t ₈ H).
3B (sites 21, 24, 26, 30)	Flat to undulating sandplains	Open <i>Eucalyptus concinna</i> / <i>Eucalyptus</i> spp. mallees, over sparse <i>Acacia hemiteles</i> tall shrubs, over scattered <i>Westringia cephalantha</i> / <i>Eremophila punctata</i> / <i>Grevillea acuaria</i> shrubs, over moderately dense <i>Triodia scariosa</i> hummock grassland (e ₇₁ e _x L.a ₃₃ S.xZ.t ₈ H).
3C (sites 17, 18)	Flat sandplains	Open <i>Eucalyptus salicola</i> / <i>Eucalyptus sheathiana</i> medium trees, over scattered <i>Senna artemisioides</i> shrubs, over sparse <i>Triodia scariosa</i> / <i>Triodia desertorum</i> hummock grasses (e ₇₃ e ₇₄ M.t ₈ t ₇ H).
4. Mixed <i>Eucalyptus</i> woodland over <i>Acacia</i> spp. shrubs, over <i>Triodia desertorum</i> hummock grassland (e_xL.a₂₁a_xS.t₇H)		
The <i>Eucalyptus</i> species woodlands of this vegetation community comprise mixed species as low trees or mallees, with sparse <i>Acacia ligulata</i> / <i>Acacia hemiteles</i> tall shrubs, over mixed scattered low shrubs, over moderately dense <i>Triodia desertorum</i> hummock grassland.		
4A (sites 19, 27, 29, 31, 33, 34, 79)	Flat to undulating sandplains / small rise	Open to moderately dense <i>Eucalyptus ceratocorys</i> / <i>Eucalyptus socialis</i> / <i>Eucalyptus platycorys</i> woodland, over sparse <i>Acacia ligulata</i> / <i>Acacia hemiteles</i> tall shrubs, over sparse <i>Halgania cyanea</i> / <i>Eremophila glabra</i> / <i>Daviesia benthamii</i> subsp. <i>acanthoclona</i> shrubs, over moderately dense to dense <i>Triodia desertorum</i> hummock grasses (e _x L.a ₂₁ a ₃₃ S.xZ.t ₇ H).
4B (sites, 78, 87, 111)	Flat to undulating sandplains	Open <i>Eucalyptus concinna</i> / <i>Eucalyptus gongylocarpa</i> mallees, over sparse to open <i>Acacia ligulata</i> / <i>Acacia hemiteles</i> tall shrubs, over scattered <i>Alyogyne pinoniana</i> / <i>Scaevola spinescens</i> / <i>Westringia cephalantha</i> shrubs, over open to moderately dense <i>Triodia desertorum</i> hummock grassland (e ₇₁ e ₁₉ L.a ₂₁ a ₃₃ S.xZ.t ₇ H).



Vegetation Unit	Landform	Vegetation Description
5. <i>Triodia rigidissima</i> / <i>T. irritans</i> hummock grasslands (t₁₃t₁₄H)		
This grassland community occurs in the northern section of the Corridor on flat dune crests and higher points on the undulating sandy plains. The community is characterised by open to moderately dense <i>Triodia irritans</i> or <i>T. rigidissima</i> .		
5A (sites 109, 110)	Flat dune crest / high point to undulating plain	Open <i>Eucalyptus eremicola</i> subsp. <i>peeneri</i> mallees, sometimes with <i>E. concinna</i> , over scattered <i>Gyrostemon ramulosus</i> tall shrubs, over scattered <i>Rulingia crauophylla</i> shrubs, over open <i>Zygophyllum apiculatum</i> herbs with open <i>Triodia irritans</i> hummocks (e ₇₅ e ₇₁ L.t ₁₄ H).
5B (sites 68, 84, 105, 106, 107, 108)	Flat dune crest / high point to undulating plain	Open <i>Eucalyptus concinna</i> / <i>Eucalyptus youngiana</i> mallees, over scattered <i>Acacia ligulata</i> / <i>Acacia hemiteles</i> tall shrubs, over scattered <i>Scaevola spinescens</i> / <i>Grevillea nematophylla</i> / <i>Acacia rigens</i> / <i>Grevillea acuaria</i> , over open to moderately dense <i>Triodia rigidissima</i> hummock grassland (e ₇₁ e ₂₀ L.t ₁₃ H).
5C (sites 86, 91, 103)	Flat dune crest / high point to undulating plain	Sparse <i>Acacia ligulata</i> / <i>Acacia hemiteles</i> tall shrubs, over scattered <i>Scaevola spinescens</i> / <i>Senna artemisioides</i> / <i>Eremophila georgei</i> shrubs, over sparse <i>Ptilotus obovatus</i> var. <i>obovatus</i> low shrubs, over dense <i>Triodia rigidissima</i> hummock grassland (t ₁₃ H).



Vegetation Unit	Landform	Vegetation Description
6. <i>Acacia aneura</i> woodland (a₁L)		
This vegetation community consists of moderately dense <i>Acacia aneura</i> woodlands and shrublands over a sparse mixed shrub stratum, mostly with mixed <i>Eremophila</i> species, <i>Prostanthera sericea</i> , and <i>Senna artemisioides</i> . This community was located primarily in the northern half of the study area.		
6A (site 28)	Flat plain	Moderately dense <i>Acacia aneura</i> / <i>Eremophila longifolia</i> woodland/shrubland, over sparse <i>Acacia burkitti</i> / <i>Acacia tetragonophylla</i> / <i>Prostanthera sericea</i> shrubs, over scattered <i>Eremophila latrobei</i> / <i>Eremophila decipiens</i> subsp. <i>decipiens</i> / <i>Ptilotus obovatus</i> subsp. <i>obovatus</i> low shrubs (a ₁ e ₂ L.xS.xZ).
6B (site 43, 44, 47, 49, 50, 72, 73, 76, 83, 101, 102)	Flat to undulating plains	Moderately dense to dense <i>Acacia aneura</i> woodland/shrubland, over open to moderately dense <i>Aluta maisonneuvei</i> subsp. <i>auriculata</i> / <i>Eremophila forrestii</i> shrubs, with sparse emergent <i>Psydrax suaveolens</i> tall shrubs, over <i>Eremophila latrobei</i> / <i>Eremophila decipiens</i> subsp. <i>decipiens</i> / <i>Senna artemisioides</i> low shrubs, over scattered <i>Brachyscome blackii</i> herbs (a ₁ L.xS.xZ).
7. Mixed low shrubland (xZ)		
This community is not common in the Corridor and is characterised by the dense <i>Leptosema daviesioides</i> shrub layer.		
7 (sites 20, 46)	Flat to undulating sandplains	Sparse <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> / <i>Eucalyptus orbifolia</i> mallees, over dense <i>Leptosema daviesioides</i> and open <i>Enekbatus eremaeus</i> / <i>Keraudrenia velutina</i> subsp. <i>elliptica</i> shrubs, over scattered <i>Dianella revoluta</i> subsp. <i>divaricata</i> and open to moderately dense <i>Triodia schinzii</i> / <i>T. basedowii</i> hummock grasses (xZ.t ₁₅ t ₂ H).



Vegetation Unit	Landform	Vegetation Description
8. <i>Triodia basedowii</i> hummock grassland (t₂H)		
This vegetation community is characterized by the presence of <i>Triodia basedowii</i> open to moderately dense hummock grassland under sparse, mixed <i>Eucalyptus</i> spp. mallees. This community was common along the Corridor.		
8A (sites 22, 37, 42, 75, 80, 90)	Flat to undulating sandplains	Sparse <i>Eucalyptus youngiana</i> mallees, over scattered <i>Acacia ligulata</i> tall shrubs, over sparse <i>Grevillea acacioides</i> / <i>Grevillea juncifolia</i> subsp. <i>temulenta</i> / <i>Mirbelia seorsifolia</i> / <i>Keraudrenia velutina</i> subsp. <i>elliptica</i> shrubs, over open to moderately dense <i>Triodia basedowii</i> hummock grassland (e ₂₀ L.xS.t ₂ H).
8B (sites 35, 38, 85, 88, 92, 94)	Flat to undulating sandplains	Sparse to open <i>Acacia ligulata</i> / <i>Acacia burkittii</i> / <i>Acacia aneura</i> tall shrubs, over sparse <i>Senna artemisioides</i> shrubs, over open to moderately dense <i>Triodia basedowii</i> hummock grasses (a _x S.t ₂ H).



Vegetation Unit	Landform	Vegetation Description
9. ± <i>Eucalyptus</i> spp. mallee or trees and <i>Casuarina pauper</i> tall shrubland (e ₂₂ e ₈ L/M.c ₂ a ₁ S.k _x xZ)		
This vegetation community occurs in the southern section of the Corridor. It is characterised by the <i>Casuarina pauper</i> and <i>Alectryon oleifolius</i> subsp. <i>canescens</i> over a low shrub layer that includes chenopods.		
9A (sites 12a, 15, 16, 25)	Flat to undulating sandplains	Open to moderately dense <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> mallee with sparse <i>Casuarina pauper</i> tall shrubs, over open to moderately dense <i>Eremophila scoparia</i> / <i>Senna artemisioides</i> / <i>Alectryon oleifolius</i> subsp. <i>canescens</i> tall shrubs, over scattered <i>Ptilotus obovatus</i> var. <i>obovatus</i> / <i>Solanum nummularium</i> / <i>Olearia muelleri</i> / <i>Sclerolaena diacantha</i> low shrubs (e ₂₂ L.xS.xZ).
9B (sites 1, 2, 3, 4, 5, 5a, 6, 7, 8, 10, 14)	Flat to undulating sandplains	Open to moderately dense <i>Casuarina pauper</i> / <i>Alectryon oleifolius</i> subsp. <i>canescens</i> tall shrubs, over open to moderately dense <i>Eremophila scoparia</i> / <i>Senna artemisioides</i> / <i>Atriplex nummularia</i> subsp. <i>spathulata</i> / <i>Eremophila glabra</i> shrubs, over open to moderately dense <i>Maireana sedifolia</i> / <i>Solanum nummularium</i> / <i>Ptilotus obovatus</i> var. <i>obovatus</i> low shrubs (c ₂ a ₁ S.xS.k ₂ xZ).
9C (sites 9, 11, 12, 13)	Flat to undulating sandplains	Open <i>Eucalyptus salmonophloia</i> trees, over open <i>Casuarina pauper</i> / <i>Alectryon oleifolius</i> subsp. <i>canescens</i> tall shrubs, over open to moderately dense <i>Eremophila scoparia</i> / <i>Senna artemisioides</i> / <i>Scaevola spinescens</i> shrubs, over open to moderately dense <i>Maireana sedifolia</i> / <i>Solanum nummularium</i> / <i>Ptilotus obovatus</i> var. <i>obovatus</i> low shrubs, over sparse <i>Paspalidium constrictum</i> soft grasses (e ₈ M.xS.k ₂ xZ).



The vegetation of the TGP has been mapped by *ecologia* (2009a in preparation). The TGP vegetation map was based on the analysis of data collected from a multiphase survey and is included in a Level 2 report on the vegetation and flora of the TGP. The Corridor survey was a single phase Level 1 survey carried out at a different time from the TGP survey and the results from the quadrats surveyed for each project have not been combined and analysed.

In order for the results from both surveys to be compared, the vegetation mapped for each project has been coded using a method similar to that employed by Beard when mapping the vegetation of Western Australia. These codes are included in brackets after the descriptions for both the main vegetation units and their sub-units. The method used is described in more detail in Appendix H and the numbering system used to denote different dominant species occurring in the TGP and Corridor project areas are tabulated in this Appendix also.

There are a number of similarities in the vegetation described for some of the units and sub-units mapped. In particular some of the sub-units in vegetation units 1, 2, 4, 6, 8 and 9 above are similar to (but not the same as) units mapped over the TGP.

Vegetation condition along the corridor ranged from pristine to degraded and fire history was the main factor affecting condition. Approximately 20 – 30% of the Corridor had been affected by fires at different times within five years of the survey. The areas that had been affected by fire and the approximate burn history are indicated in the Figures in Appendix I. The burn history of the vegetation has been graded as very recent (< 0.5 year old), recent (< 1 yr old), moderate (> 1 year but < 5 years old) and old (> 5 years old). The vegetation appeared not to have been burnt in the remaining, unlabelled vegetation mapped along the corridor.

4.5 STATE AND NATIONALLY RECOGNISED THREATENED ECOSYSTEMS

Ecological communities are naturally occurring biological assemblages that are present in a particular type of habitat. At a National level, threatened ecological communities (TECs) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) are protected and categorised as either 'Critically Endangered', 'Endangered' or 'Vulnerable' (see Appendix C for definitions).

No TEC protected at a National level occurs within the survey area.

The Western Australian Department of Environment and Conservation (DEC) maintains a list of TECs that are categorised as being either 'Presumed Totally Destroyed', 'Critically Endangered', 'Endangered' or 'Vulnerable'. Possible TECs that do not meet survey criteria, or that are not adequately defined, are added to a list of priority ecological communities (PECs). Communities are placed in this category while consideration can be given to their declaration as TECs (see Appendix C for definitions of TECs and PECs).

One state listed PEC occurs to the west of the survey area - the Yellow sandplain communities of the Great Victoria Desert – (a Priority 3(ii) PEC).

Figure 4.1 outlines the potential southern boundary of the Yellow sandplain communities (supplied by DEC) of the PEC is shown between yellow markers. The infrastructure corridor appears to avoid the PEC for most of its length, apart from some potential areas in the northern section which are possibly near its boundary and potentially may cross it (green boundary). However since neither the northern boundary nor the vegetation which distinguishes this community type has yet to be delineated, it remains unclear if the current survey area supports this community type.

The northern and southern boundary points of sections A and B are listed below in Table 4.6.



Table 4.6: GPS-coordinates and extent of possible PEC impact areas

Location	WGS84 Zone 51 J		Distance km
	Easting	Northing	
Section A			
Northern end	657618	6736247	12
Southern end	655817	6725644	
Section B			
Northern end	648319	6716559	3
Southern end	646023	6713764	

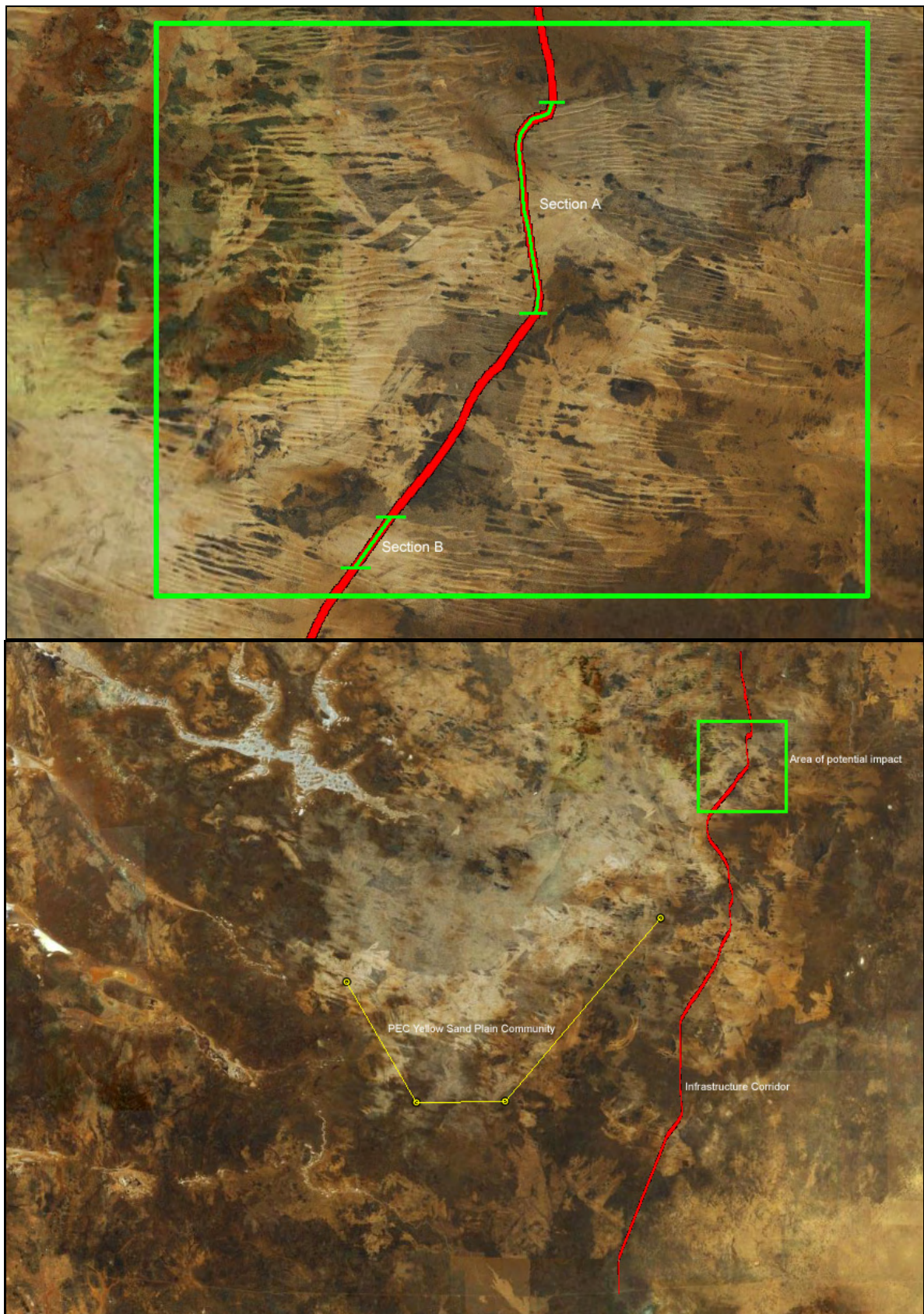


Figure 4.1: Location of PEC in relation to infrastructure corridor



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5.0 Relevant Legislation and Compliance with Recognised Standards

Native flora and fauna in Western Australia are protected at a Federal level under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and at a State level under the *Wildlife Conservation Act 1950* (WC Act) and *Environmental Protection Act 1986* (EP Act).

5.1 FEDERAL EPBC ACT 1999

The EPBC Act was developed to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance, to promote ecologically sustainable development through the conservation and sustainable use of natural resources; and to promote the conservation of biodiversity. The EPBC Act includes provisions to protect native species (and in particular prevent the extinction, and promote the recovery, of threatened species) and to ensure the conservation of migratory species. In addition, Section 3a of the Act includes the principle of ecologically sustainable development dictating that decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.

5.2 STATE WC ACT 1950

The state *Wildlife Conservation Act* was developed to provide for the conservation and protection of wildlife in Western Australia. Under Section 14 of this Act, all fauna and flora within Western Australia are protected; however, the Minister may, via a notice published in the *Government Gazette*, declare a list of fauna and flora taxa identified as likely to become extinct, or as rare, or otherwise in need of special protection. The current listing was gazetted on the 5th of August, 2008.

5.3 STATE EP ACT 1986

The *Environmental Protection Act 1986* is “an Act to provide for an Environmental Protection Authority, for the prevention, control and abatement of environmental pollution, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing.” Section 4a of this Act outlines five principles that are required to be addressed to ensure that the objectives of the Act are addressed. Three of these principles are relevant to native fauna and flora:

- *The Precautionary Principle*

Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

- *The Principles of Intergenerational Equity*

The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

- *The Principle of the Conservation of Biological Diversity and Ecological Integrity*

Conservation of biological diversity and ecological integrity should be a fundamental consideration.



5.4 WA EPA GUIDANCE AND POSITION STATEMENTS

The survey methods adopted by *ecologia* are aligned with the Environmental Protection Authority's Guidance Statement No. 51 (EPA, 2004) - Guidance for the assessment of environmental factors: Terrestrial flora and vegetation surveys for environmental impact assessment in Western Australia, and Position Statement No. 3 (EPA, 2002) - Terrestrial biological surveys as an element of biodiversity protection.

The bulk of the project area occurs in the Great Victoria Desert Bioregion. Based on the location and the scale of the development, Guidance Statement No. 51 recommends that a Level 1 survey be undertaken (Reconnaissance Field Survey). The purpose of a Reconnaissance Field Survey is to verify the accuracy of the background study, to further delineate and characterise the flora and the range of vegetation units present in the target area and to identify potential impacts. It requires:

“a target area visit by suitably qualified personnel to undertake selective, low intensity sampling of the flora and vegetation, and maps of vegetation units and vegetation condition at an appropriate scale.”

5.5 ACCEPTABILITY OF SURVEY AND SAMPLING DESIGN

See Table 5.1 overleaf.



Table 5.1: Acceptability of survey and sampling design

REQUIREMENT	EPA STATEMENT	RELEVANCE TO PROJECT	PROJECT COMPLIANCE
Impact on Biodiversity	Position Statement No. 3	Where impact on biodiversity cannot be avoided, the proponent must demonstrate that the impact will not result in unacceptable loss.	Fourteen species of conservation significance were recorded during the survey (see Section 4.2.2 for details). While priority taxa were distributed along the length of the Corridor - with appropriate management it should be possible to reduce or remove significant impacts to these species and the communities that support them. Impacts within the project area will be localised, as it involves the widening of an existing track (120 km) and the construction of a shorter section of new track (95 km). A project area wider (200 m) than the road corridor to be cleared (20 m) was surveyed.
State, National and International Agreements, Legislation and Policy on Biodiversity	Position Statement No. 3	Information gathered for environmental impact assessment in Western Australia meets State, National and International Agreements, Legislation and Policy in regard to biodiversity conservation.	Impacts to species listed under relevant legislature are addressed in Sections 6 and 7. The relevance of the project to principles outlined in the <i>Environmental Protection Act 1986</i> is discussed in Section 6.
EPA Standards, Requirements and Protocols	Position Statement No. 3	The quality of information and scope of field surveys meets the standards, requirements and protocols as determined and published by the EPA.	The current survey conforms to a Level 1 survey, comprising a desktop study, a single phase reconnaissance survey and basic mapping of the vegetation of the area, as per Guidance Statement 51.
Biodiversity Conservation and Ecological Function Values	Position Statement No. 3	Sufficient information is provided to address biodiversity conservation and ecological function values.	Impacts to biodiversity and ecological function are discussed. The value of the vegetation associations occurring in the project area is also discussed in a bioregional context.
State Biological Databases	Position Statement No. 3	Terrestrial biological surveys will be made publicly available and will contribute to the bank of data available for the region.	Voucher specimens of the 14 Priority Flora taxa recorded during the survey will be lodged at the WA Herbarium.



REQUIREMENT	EPA STATEMENT	RELEVANCE TO PROJECT	PROJECT COMPLIANCE
Sampling design and intensity at two levels – regional and area specific	Guidance Statement No. 51	Sites were assessed at the area specific level.	Data was collected on an area specific level. Limited information is available from large, independent surveys undertaken in the region but other surveys have been carried out by <i>ecologia</i> at Tropicana; and information from these surveys has been referred to in this report.
Landform – scale, rarity, heterogeneity	Guidance Statement No. 51	Sites should be established in the different landforms occurring across the study area.	Sites were selected from aerial photography before going to the field. In the field ground-truthing of the vegetation types occurring in the different areas was carried out, and sites were added or removed depending on their representation in the area. One hundred and fourteen quadrats and 59 transects were assessed during the survey.
Habitat – scale, rarity, heterogeneity	Guidance Statement No. 51	Sites should be established in the different habitats occurring across the study area.	Sites were selected from aerial photography before going to the field. In the field ground-truthing of the vegetation types occurring in the different areas was carried out, and sites were added or removed depending on their representation in the area.
Vegetation structure, diversity and seasonality	Guidance Statement No. 51	Sufficient information is to be provided in the report on vegetation structure, diversity and seasonality.	The report details the results of a vegetation mapping exercise. Multivariate analysis of the data and digital mapping of the vegetation associations was carried out. Descriptions of the vegetation associations produced as a result of the analysis are provided. The single phase survey was carried out in July and August 2007. Forty-one of the 417 species collected were annuals and another 14 were annual/perennials; this indicates that the survey was carried out after adequate rains.
Potential for conservation significant flora to occur, based on habitat analysis	Guidance Statement No. 51	Sufficient information is to be provided to indicate the potential for significant flora to occur based on habitats in the area.	Lists of conservation significant taxa recorded in the vicinity of the project area are provided. An analysis has been carried out on the likelihood of these taxa occurring in the area.



REQUIREMENT	EPA STATEMENT	RELEVANCE TO PROJECT	PROJECT COMPLIANCE
Results including species/area curves, species and ecosystem diversity and heterogeneity	Guidance Statement No. 51	Adequate information is provided in the report to comply with this requirement.	Details on the flora of the Corridor are included in the report. A vegetation map and vegetation descriptions are provided for the main alignment of the proposed Corridor.
Information on adjacent areas – previous surveys and herbarium records	Guidance Statement No. 51	Limited information was available on the wider project area, as few large-scale surveys have been undertaken in the area.	Information was requested from relevant government databases and collated from reports on earlier surveys undertaken in the region.



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6.0 Conservation Significance

The significance of the biota of the project area has been assessed at four spatial scales; international/national, state, regional and local.

6.1 STATUTORY FRAMEWORK

Legislation applicable to the conservation of native flora and fauna includes, but is not limited to, the *Environment Protection and Biodiversity Conservation Act 1999*, the *Wildlife Conservation Act 1950*, and the *Environmental Protection Act 1986*.

6.2 NATIONAL SIGNIFICANCE

National significance refers to those features of the environment which are recognised under legislation as being of importance to the Australian community. Species scheduled under the Commonwealth EPBC Act are regarded as nationally significant.

No flora species listed under the EPBC Act were recorded during the survey.

No threatened ecological communities of national significance were recorded during the survey.

6.3 STATE SIGNIFICANCE

State significance refers to those features of the environment that are recognised under Western Australian legislation as of importance to the community; in particular, species scheduled under the *Wildlife Conservation Act 1950*.

No flora taxa scheduled under the Wildlife Conservation Act 1950 were recorded during the survey.

No threatened ecological communities of state significance were recorded during the survey of the proposed corridor.

6.4 REGIONAL SIGNIFICANCE

Regional significance addresses the representation of species and habitats at a biogeographic regional level. Species or habitat types that are endemic to the Great Victoria Desert and Nullarbor bioregion or the Corridor, and whose distributions are limited or unknown are considered regionally significant.

Fourteen Priority Flora taxa of regional significance were recorded during the survey. Table 6.1 provides information on the records on FloraBase (Western Australian Herbarium, 2008) for each of the Priority Flora taxa collected during the survey.



Table 6.1: FloraBase records for the Priority Flora species collected during this survey

Species	Priority	Number of Records	Abundance	Location
<i>Dampiera eriantha</i> (Goodeniaceae)	P1	5	Few	Great Victoria Desert
<i>Olearia arida</i> (Asteraceae)	P2	7	Frequent	N of Plumridge Lakes Reserve, Officer Basin Airstrip, W of Plumridge Lakes, S of Neale Junction
<i>Dicrastylis nicholasii</i> (Lamiaceae)	P2	8	Occasional	Plumridge Lakes Reserve, W boundary fence, Kanada Station
<i>Physopsis chrysotricha</i> (Lamiaceae)	P2	2	Occasional	Victoria Desert Camp 54, N to NNE of Queen Victoria Springs Nature Reserve
<i>Baeckea</i> sp. Gt Victoria Desert (Myrtaceae)	P2	7	Occasional and up to 100+ plants	N of Streich Mound in Queen Victoria Spring Nature Reserve, Officer Basin, Great Victoria Desert, Black Range Station
<i>Malleostemon</i> sp. Officer Basin (Myrtaceae)	P2	4	Occasional to frequent	ENE of Queen Victoria Spring, SE of Officer Basin,
<i>Isotropis canescens</i> (Papilionaceae)	P2	4	Occasional to abundant	Lochada Station, NNE of Queen Victoria Spring, N of Cundeleele,
<i>Grevillea secunda</i> (Proteaceae)	P2	16	Occasional to abundant (1 plant to 50+)	NE of Queen Victoria Spring, Streich Mound, Queen Victoria Spring Nature Reserve, Officer Basin, Doney Lagoon
<i>Dicrastylis cundeleeensis</i>	P3	11	Occasional to abundant	Cundeleele, Plumridge Lakes, Rawlinna
<i>Microcorys macredieana</i> (Lamiaceae)	P3	24	Occasional to abundant (1 to 300 plants)	Queen Victoria Spring, Bounty Powerline, N of Steich Mound, NNE Queen Victoria Spring, SE of Angus Corner, E of Officer Basin, Rawlinson Range
<i>Micromyrtus stenocalyx</i> (Myrtaceae)	P3	17	Occasional and 20 to 50 plants	Plumridge Lakes Nature Reserve, Queen Victoria Spring, PNC Road, Queen Victoria Spring Nature Reserve, NE of Cundeleele
<i>Comesperma viscidulum</i> (Polygalaceae)	P4	9	Occasional to common	Little Sandy Desert, WNW of Lake Sunshine, Carnarvon Range, E of Cosmo Newbery, Officer Basin, Great Victoria Desert
<i>Daviesia purpurascens</i> (Papilionaceae)	P4	51	Occasional to frequent (5 to 300+ plants)	WNW of Queen Victoria Rock Road, Brookton – Corrigin Highway, Mt Jackson, W side of Midland Road, Namelcatchem, Mt Manning Range, Queen Victoria Spring Nature Reserve, Tamala Station, Aurora Range
<i>Lepidobolus deserti</i> (Restionaceae)	P4	19	Occasional to frequent (8 to more than 100 plants)	Goongarrie Station, N of Queen Victoria Nature Reserve, Streich Mound, Kangaroo Hills Timber Reserve, S of Woolgangie, E of Queen Victoria Spring, SE of Queen Victoria Spring, E of Janies Well, Comet Vale

Information sourced from FloraBase (Western Australian Herbarium, 2009) and Atkins (2008(2)).

Fewer than five records exist for four of the Priority species recorded during the survey: *Dampiera eriantha* (P1), *Physopsis chrysotricha* (P2), *Malleostemon* sp. Officer Basin (P2)



and *Isotropis canescens* (P2). One of the four *D. eriantha* records occurs within Plumridge Lakes Nature Reserve, one of the four *Malleostemon* sp. Officer Basin records is within Queen Victoria Springs Nature Reserve, and all four of the *Isotropis canescens* records are within nature reserves (one from Plumridge Lakes Nature Reserve and three from Queen Victoria Springs Nature Reserve). *Physopsis chrysotricha* is not recorded as occurring in nature reserves close to the survey area.

Table 6.2 indicates the typical habitats in which the Priority Flora species collected during the survey were located.

Table 6.2: Typical habitats of the Priority Flora species collected during the Corridor survey

Species	Family	Rank	Typical Habitat
<i>Dampiera eriantha</i>	Goodeniaceae	P1	Dunes (yellow)
<i>Olearia arida</i>	Asteraceae	P2	Typically on deeper sands generally associated with <i>Eucalyptus gongylocarpa</i>
<i>Dicrastylis nicholasii</i>	Lamiaceae	P2	On deeper sands and especially in areas that had been burnt
<i>Physopsis chrysotricha</i>	Lamiaceae	P2	Undulating sandplain
<i>Baeckea</i> sp. Gt Victoria Desert	Myrtaceae	P2	Flat, red, loamy sandplain
<i>Malleostemon</i> sp. Officer Basin	Myrtaceae	P2	Dunes (yellow/pale orange)
<i>Isotropis canescens</i>	Papilionaceae	P2	Undulating sandplain
<i>Grevillea secunda</i>	Proteaceae	P2	Generally on or close to dunes (red and yellow)
<i>Dicrastylis cundeeleensis</i>	Lamiaceae	P3	Flat sandplain, undulating sandplain, flat crest of dune, undulating dune
<i>Microcorys macredieana</i>	Lamiaceae	P3	Dunes (mostly yellow)
<i>Micromyrtus stenocalyx</i>	Myrtaceae	P3	Dunes (yellow to orange) and undulating sand plains
<i>Comesperma viscidulum</i>	Polygalaceae	P4	Dunes (red) and yellow to orange undulating sand plains
<i>Daviesia purpurascens</i>	Papilionaceae	P4	On deeper sands close to dunes
<i>Lepidobolus deserti</i>	Restionaceae	P4	Dunes (yellow or orange)

The locations and typical habitats in which those species with fewest recorded populations on FloraBase occur are discussed below.

Dampiera eriantha (P1): five collections were made of this species and each was from a dune (yellow sand). Four of the collections were on the eastern fork of the existing Haul Road leading to Plumridge Lakes Nature Reserve while the fifth was an opportunistic collection made on the main (and existing) track alignment.

Physopsis chrysotricha (P2): three collections were made of *P. chrysotricha* and one of these was collected opportunistically while walking from site to site on the eastern fork. A second opportunistic collection was made while traversing from site to site on the main (existing) track alignment and the third was at a quadrat established on an undulating plain in the proposed new section.

Malleostemon sp. Officer Basin (P2): two collections were made of *M. sp. Officer Basin* and both were at sites on dunes along the eastern fork of the existing Haul Road leading to Plumridge Lakes Nature Reserve.



Isotropis canescens (P2): one collection was made of *I. canescens* and this was along a transect walked on the main (and existing) alignment of the Corridor in an area of flat undulating sandplain.

As few records exist for these taxa their regional conservation significance can be rated as high.

6.5 LOCAL SIGNIFICANCE

Species are of local significance when their presence is confined to a specialised habitat type that is not common within the local area and the disturbance or removal of which could lead to local extinction.

Those vegetation communities closely related to dunal landforms eg; community type two and five have the potential to support several of the Priority taxa recorded during the survey. As Table 6.2 addresses, eight of the 14 Priority species recorded along the survey corridor generally occur on or close to dunal habitats. Dunal habitats are widely distributed throughout the GVD and are well represented in the region. It is recommended that these areas be avoided where possible during the final positioning of the infrastructure due to their potential to support Priority taxa.

Community type one (e_xL.t₇t₁₂H), which occurs on sand hills and undulating plains contained nine of the fourteen Priority taxa across the survey area. The priority four taxa *Comesperma viscidulum* and *Daviesia purpurascens* were only recorded within this community type. Due to the linear alignment of the survey area and low representative collections of these taxa, it is difficult to determine the significance of this observation.

Caution should be undertaken within areas of recent burn history (1 to 2 years) to avoid hindering regeneration of native taxa and vegetation communities. As is discussed in Table 6.1 the Priority two taxon *Dicrastylis nicholasii* is frequently recorded as occurring on deeper sands and particularly in areas that have been burnt.

At a local scale, the abundance of each unit within the survey area is summarised in Table 6.3. The most abundant community types are the Type 4, Mixed *Eucalyptus* woodland over mixed *Acacia* shrubs over *Triodia desertorum* hummock grassland and type 9, ± *Eucalyptus* mallee or trees and *Casuarina pauper* tall shrubland.

Community types seven, mixed low shrublands and six *Acacia aneura* woodlands, demonstrated the lowest cover of all vegetation communities within the linear survey area.

As discussed previously the Yellow sandplains PEC is located within close proximity to the project area however since neither the northern boundary nor the vegetation which distinguishes this community type has yet to be delineated, it remains unclear if the current survey area supports this community type.



Table 6.3: The abundance of each vegetation unit within the project area

Vegetation Community	Code	Area within project	% of total area
1. Mixed <i>Eucalyptus</i> spp. woodland over hummock grassland	(e _x L.t ₇ t ₁₂ H)	5124	11.89029
2. <i>Callitris preissii</i> tall shrubland	(p ₂ S)	4652	10.79501
3. Mixed <i>Eucalyptus</i> woodland over <i>Triodia scariosa</i> hummock grassland	(e _x L.t ₈ H)	4963	11.51668
4. Mixed <i>Eucalyptus</i> woodland over <i>Acacia</i> spp. shrubs, over <i>Triodia desertorum</i> hummock grassland	(e _x L.a ₂₁ a _x S.t ₇ H)	8490	19.70112
5. <i>Triodia rigidissima</i> / <i>T. irritans</i> hummock grasslands	(t ₁₃ t ₁₄ H)	4364	10.1267
6. <i>Acacia aneura</i> woodland	(a ₁ L)	3008	6.98009
7. Mixed low shrubland	(_x Z)	30	0.069615
8. <i>Triodia basedowii</i> hummock grassland	(t ₂ H)	5141	11.92973
9. + <i>Eucalyptus</i> spp. mallee or trees and <i>Casuarina pauper</i> tall shrubland	(e ₂₂ e ₈ L/M.c ₂ a ₁₂ S.k _x xZ)	7322	16.99076



6.6 BIODIVERSITY

Australia has an International obligation to maintain biodiversity. The Commonwealth government has initiated the National Strategy for the Conservation of Biological Diversity, which incorporates elements of the National Strategy for Ecologically Sustainable Development (NSED). Biological diversity (biodiversity) relates to the richness of the biota at a local, regional, state, national or even global level, and includes all components of the environment, from bacteria to insects, plants, and vertebrate fauna. Biodiversity can be thought of as existing at several levels, including genetic, population and species (or taxon) diversity. This study examines biodiversity at the species and population level, and places it within a local, regional and national context.

A major issue from a biodiversity perspective is the restriction of individual species to a particular habitat of the project area. As outlined in Table 6.1 seven of the Priority taxa recorded during the survey occur predominantly on sand dunal habitats. As the impacts to dunal habitats are minimal, this is not considered to be of significance.

The most restricted vegetation type (that the Corridor runs through area wise and as mapped by Beard, 1975) is a section of mallee and spinifex with patches of salmon gum and gimlet at the southern end of the existing Haul Road. This has a limited distribution, as it occurs in the Southwestern Interzone an area of transition occurring between the Southwestern botanical province and the Great Victoria Desert. Vegetation in this area is more varied than in the desert and mosaics of vegetation on a small scale occur.

The vegetation in this section of the Corridor separated out into a unit dominated by *Eucalyptus* and *Casuarina* and the current description of the vegetation is very similar to that mapped as Eucalypt/Casuarina Formations by Pearson (1994) in his survey of Queen Victoria Springs Nature Reserve.

The road in this area already exists and it would be widened only. Also, fewer priority taxa were recorded in this section of the survey corridor than in sections to the north.

A second vegetation type, mulga low woodland, is locally restricted as only one small patch was mapped by Beard (1975) in the vicinity of the survey corridor. However, larger areas are mapped to the north in the Tropicana project area and extensive areas to the west in the Murchison and Gascoyne bioregions. Based on the data from the sites along this section of the corridor, it was mapped as *Acacia aneura* woodland and *Callitris preissii* tall shrubland. The density of priority flora taxa was lower in this part of the survey corridor than in others.

Because of the above, loss or modification of habitat within the project area is unlikely to reduce regional biodiversity greatly.

Part of the purpose of the Interim Biogeographic Regionalisation of Australia (Thackway and Cresswell, 1995) was to examine the representation of ecosystems within conservation reserves at a bioregional level to ensure that the biodiversity of each bioregion was maintained. The Corridor lies between Plumridge Lakes, Queen Victoria Springs and Neale Junction Nature Reserves and most of Beard's vegetation systems that the Corridor travels through are represented in these reserves.



7.0 Environmental Impacts

7.1 IMPACTS ON VEGETATION AND FLORA

The vegetation associations, habitats and landforms found in the project area (and within the proposed disturbance footprint) are not considered to be of regional conservation or ecological significance and appear to be represented in other parts of the Great Victoria Desert / Nullarbor biogeographic regions. This implies that at a regional scale loss of vegetation associations, habitat types and landforms found in the project area will not constitute a significant loss of biodiversity.

Potential impacts on flora and vegetation of the proposed Corridor include:

- loss of natural vegetation through clearing
- loss of conservation significant species through clearing; and
- loss of flora habitat from indirect activities.

Clearing: Loss of vegetation and flora habitat

The most substantial environmental impact arising from the proposed project would be the clearing of native vegetation, the consequent loss of flora and loss of habitat. The areas proposed to be disturbed are well represented in the surrounding vegetation and a narrow band of vegetation is to be cleared. Also, more than 50% of the land to be cleared is along an existing track that is to be widened.

Some flora species of conservation significance are expected to be lost while clearing vegetation for the proposed Corridor. However, this loss should be minimised, as the locations of all priority flora taxa encountered during the survey have been recorded, and in some instances plants were flagged so that they can be avoided whenever possible. Additional populations can be looked for and avoided when vegetation clearing is taking place. Extra effort can be expended to ensure that those Priority listed plants with few records on FloraBase are not impacted by the clearing activities.

Indirect loss of flora habitat

Flora habitats can be impacted by indirect impacts from increased activity in the area such as fire, weeds, feral animals and dust and other impacts arising from increased traffic.

No 'declared' weeds listed under the *Agriculture and Related Resources Protection Act, 1976* have been recorded in the project area. Some weed species have been recorded during other surveys in the area (e.g. **Spergularia rubra*) and could be transported into the area unless precautionary measures are taken. One environmental weed species, **Carrichtera annua* was recorded along the Corridor and its spread should be minimised. Many environmental weeds (including those mentioned above) can be highly invasive resulting in the displacement of native vegetation and the loss of habitat for flora species.

An environmental impacts risk assessment analysis has been carried out and is presented in Appendix J. The analysis considers the main activities that could impact on the vegetation and flora as a result of construction of the proposed haul road. Using a risk matrix and risk assessment ratings, the inherent risk level (the product of the scores for the likelihood of an event occurring and its consequence) is calculated. The significance of this risk level is then rated as either low, moderate or high. Controls are suggested and the residual risk associated with the activities is then calculated in the same way. The analysis indicates that by employing various management actions the impact risks associated with key activities could be reduced from high and moderate to moderate and low.



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8.0 Management Recommendations

Recommendations are listed in two categories where appropriate; design level and management level. Recommendations at the design level present strategies which will mitigate impacts to the environment inherent in the design of proposed developments. Management level recommendations aim to reduce the ongoing impacts to the biological environment following construction and to preserve existing conservation values. In order to reduce impacts to flora and fauna from the establishment of an Access Rd, TJV should undertake the following:

Construction and Operation of Mine Access Road

DESIGN LEVEL

RECOMMENDATION 1

Limit the impact on conservation significant flora. The known locations of Conservation Significant Taxa and potentially significant taxa should be avoided during the haul road construction. It is also recommended that dunal areas be avoided where possible to reduce impacts to possible Conservation Significant Flora habitat.

RECOMMENDATION 2

Minimise vegetation clearing to that which is absolutely necessary within the design parameters of the project. All clearing should not extend beyond that needed for the haul road. This will ensure that any significant species potentially occurring outside the study area will not be impacted.

RECOMMENDATION 3

Minimise the height of stockpiles of soil and cleared vegetation. Multiple smaller stockpiles, dispersed at regular intervals along the length of the edges of cleared areas, are preferable to a single stockpile. Lower stockpiles allow greater retention of biological activity within the soil (bacteria, fungi and lichen), which improves seed germination rates once the soil is respread.

RECOMMENDATION 4

Reduce the incidence of weed transfer. Vehicular traffic, combined with increased ground disturbance and water availability from dust suppression measures, provide an opportunity for alien species to become established unless weed hygiene procedures are implemented.

RECOMMENDATION 5

Dust suppression. Dust suppression methods must be incorporated into haul road operation, upgrade and maintenance activities to minimise the impacts on vegetation adjoining the haul road.

RECOMMENDATION 6

Reduce the quantity of saline water used for dust suppression. The use of hyper saline water to suppress dust levels during the construction, operation and maintenance of the haul road can adversely impact flora and should be avoided. Monitoring of road side vegetation to



MANAGEMENT LEVEL

The following management items are recommended to mitigate impacts of the development on native flora:

RECOMMENDATION 7

Implement existing environmental procedures through staff and contractor induction. AGAA should continue to implement environmental procedures for staff and all contractors by including the following items into their on-site induction, managing the risk of fire, weed hygiene procedures, Priority flora recognition and encouraging general environmental impact awareness.

Construction and Operation of Communication Corridor

DESIGN LEVEL

RECOMMENDATION 1

Limit the impact on conservation significant flora. The known locations of Conservation Significant Taxa and potentially significant taxa should be avoided during the haul road construction. It is also recommended that dunal areas be avoided where possible to reduce impacts to possible Conservation Significant Flora habitat.

RECOMMENDATION 2

Minimise vegetation clearing to that which is absolutely necessary within the design parameters of the project. All clearing should not extend beyond that needed for the haul road. This will ensure that any significant species potentially occurring outside the study area will not be impacted.

RECOMMENDATION 3

Reduce the incidence of weed transfer. Vehicular traffic, combined with increased ground disturbance and water availability from dust suppression measures, provide an opportunity for alien species to become established unless weed hygiene procedures are implemented.



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APPENDIX A: Quadrat and transect locations



Table A.1: Quadrat sites surveyed along the Corridor

Quadrat No.	Zone		Easting (mE)	Northing (mN)
1	51	J	613668	6568896
2	51	J	613623	6571083
3	51	J	613721	6572910
4	51	J	613780	6574366
5	51	J	614625	6578324
5A	51	J	614764	6578732
6	51	J	615291	6580003
7	51	J	615680	6580754
8	51	J	617525	6585304
9	51	J	617830	6585883
10	51	J	619423	6589804
11	51	J	619759	6590963
12	51	J	620288	6592243
12A	51	J	621473	6594838
13	51	J	622239	6596929
14	51	J	623243	6598999
15	51	J	624141	6601212
16	51	J	624430	6601819
17	51	J	625275	6603973
18	51	J	625754	6605056
19	51	J	626599	6607404
20	51	J	628313	6611182
21	51	J	628664	6611993
22	51	J	629502	6613850
23	51	J	630937	6615601
24	51	J	632706	6617775
25	51	J	634053	6620811
26	51	J	663907	6625006
27	51	J	634070	6624175
28	51	J	633829	6626275
29	51	J	633625	6630777
30	51	J	663624	6633770
31	51	J	633700	6636297
32	51	J	633880	6638019
33	51	J	633857	6639923
34	51	J	633786	6642248
35	51	J	633819	6643557
36	51	J	633917	6646213
37	51	J	635617	6651389
38	51	J	636073	6652098
39	51	J	636646	6653223
40	51	J	637999	6655584
41	51	J	639667	6657340
42	51	J	641766	6660627
43	51	J	643845	6663842
44	51	J	644795	6665350
45	51	J	645552	6666438
46	51	J	646761	6668421
47	51	J	646714	6670673
48	51	J	648138	6673170



Quadrat No.	Zone		Easting (mE)	Northing (mN)
49	51	J	649082	6674746
50	51	J	649779	6675925
51	51	J	651656	6678785
52	51	J	652570	6680435
53	51	J	654939	6682628
54	51	J	6566130	6684764
55	51	J	655449	6685366
56	51	J	655657	6688065
57	51	J	657184	6688280
58	51	J	659158	6682988
59	51	J	660212	6689295
60	51	J	661330	6689449
61	51	J	661676	6689832
62	51	J	662889	6691944
63	51	J	663708	6693153
64	51	J	665547	6696993
65	51	J	665809	6697987
66	51	J	667117	6700173
67	51	J	707271	6702066
68	51	J	645445	6713050
69	51	J	646147	6713891
70	51	J	647645	6715681
71A	51	J	648729	6717066
72	51	J	651401	6720609
73	51	J	651991	6720767
74	51	J	652165	6721102
75	51	J	653076	6722630
76	51	J	654610	6723990
77	51	J	654995	6724271
78	51	J	656319	6726379
79	51	J	656297	6728266
80	51	J	6561075	6730576
81	51	J	655994	6731270
82	51	J	657422	6737041
83	51	J	656420	6735692
84	51	J	657673	6736422
85	51	J	657747	6736865
86	51	J	657416	6740270
87	51	J	657101	6742688
88	51	J	656747	6744527
89	51	J	654854	6754910
90	51	J	655499	6751586
91	51	J	655660	6750577
92	51	J	655853	6749427
93	51	J	654752	6755961
94	51	J	654774	6756495
95	51	J	654725	6757781
96	51	J	654738	6758725
97	51	J	654812	6760485
98	51	J	650058	6678830
99	51	J	649806	6683452
100	51	J	650463	6684736



Quadrat No.	Zone		Easting (mE)	Northing (mN)
101	51	J	650845	6686355
102	51	J	650847	6687332
103	51	J	649984	6689732
104	51	J	649880	6691106
105	51	J	649149	6695634
106	51	J	648797	6696721
107	51	J	647664	6698902
108	51	J	646096	6701104
109	51	J	644825	6702681
110	51	J	643567	6705217
111	51	J	643235	6708377
112	51	J	643599	6710243

Coordinates in WGS84



Table A.2: Transects surveyed along the Corridor

Transect	Zone		Easting (mE)	Northing (mN)	→	Easting (mE)	Northing (mN)
CMC-T1	51	J	628566	6612056	To→	628651	6612238
CMC-T2	51	J	633830	6636268	To→	633828	6636777
CMC-T3	51	J	651477	6678663	To→	651400	6678535
CMC-T4	51	J	656577	6744956	To→	656534	6745314
JN-T1	51	J	613626	6572953	To→	613653	6574395
JN-T2	51	J	624441	6601976	To→	624741	6602657
JN-T3	51	J	633895	6625170	To→	633840	6626400
JN-T4	51	J	646717	6668466	To→	646622	6669135
JN-T5	51	J	655823	6688076	To→	656647	6688191
MH-T1	51	J	620369	6592162	To→	621474	6594845
MH-T2	51	J	639713	6657299	To→	640124	6657872
MH-T3	51	J	656057	6735245	To→	655916	6734447
CT-T1	51	J	613742	6574360	To→	613743	6575160
CT-T2	51	J	614618	6578332	To→	614757	6578670
CT-T3	51	J	617484	6585311	To→	617756	6585956
CT-T4	51	J	621403	6594807	To→	621567	6595214
CT-T5	51	J	622172	6596600	To→	622515	6597439
CT-T6	51	J	625237	6603992	To→	625688	6605066
CT-T7	51	J	625688	6605066	To→	626206	6606296
CT-T8	51	J	629518	6613930	To→	629729	6614171
CT-T9	51	J	630906	6615626	To→	631195	6615987
CT-T10	51	J	634023	6624229	To→	633960	6624834
CT-T11	51	J	633927	6626201	To→	633787	6626443
CT-T12	51	J	633777	6638124	To→	633780	6638591
CT-T13	51	J	633806	6639946	To→	633792	6639531
CT-T14	51	J	633884	6646267	To→	633889	6646489
CT-T15	51	J	635602	6651445	To→	635978	6652056
CT-T16	51	J	635977	6652058	To→	636529	6652952
CT-T17	51	J	641827	6660603	To→	642107	6661072
CT-T18	51	J	643912	6663902	To→	644265	6664457
CT-T19	51	J	646690	6670713	To→	646681	6671088
CT-T20	51	J	648090	6673193	To→	648300	6673524
CT-T21	51	J	652571	6680349	To→	652728	6680580
CT-T22	51	J	654906	6682681	To→	655210	6682877
CT-T23	51	J	657282	6688440	To→	657678	6688642
CT-T24	51	J	659090	6689376	To→	659634	6689340
CT-T25	51	J	662897	6691904	To→	663186	6692351
CT-T26	51	J	663186	6692351	To→	663227	6692460
CT-T27	51	J	663423	6692744	To→	663477	6692800
CT-T28	51	J	665492	6697021	To→	665909	6696761
CT-T29	51	J	661667	6689908	To→	662191	6690754
CT-T30	51	J	668328	6702015	To→	668474	6702204
CT-T31	51	J	654853	6754901	To→	654749	6755728
CT-T32	51	J	654752	6755961	To→	654773	6756495
CT-T33	51	J	654803	6757028	To→	654814	6757383
CT-T34	51	J	654814	6757383	To→	654725	6757781
CT-T35	51	J	654840	6759379	To→	654822	6759734
CT-T36	51	J	654684	6760791	To→	654670	6761129



Transect	Zone		Easting (mE)	Northing (mN)	→	Easting (mE)	Northing (mN)
CT-T37	51	J	655499	6751586	To→	655605	6750599
CT-T38	51	J	657851	6736822	To→	657673	6736401
CT-T39	51	J	657673	6736401	To→	657111	6735907
CT-T40	51	J	655821	6731264	To→	655832	6731184
CT-T41	51	J	656090	6728271	To→	656388	6726403
CT-T42	51	J	653662	6722635	To→	654610	6723990
MH-T4	51	J	649993	6683911	To→	650464	6684735
MH-T5	51	J	646883	6700158	To→	646118	6701074
MH-T6	51	J	648723	6717035	To→	647646	6715690
JN-T6	51	J	649161	6695638	To→	648797	6696721
JN-T7	51	J	643565	6705217	To→	643265	6707392

Coordinates in WGS84



APPENDIX B: Species list for the Corridor



See notes at bottom of table for explanation of columns three to seven.

Family	Name	GVD	NUL	COO	MUR	P / RE / SOI
Amaranthaceae	<i>Ptilotus ?holosericeus</i>		Y			
	<i>Ptilotus exaltatus</i> var. <i>exaltatus</i>	Y				
	<i>Ptilotus exaltatus</i> var. <i>villosus</i>	Y				
	<i>Ptilotus obovatus</i> var. <i>obovatus</i>	Y				
	<i>Ptilotus polystachyus</i>	Y				
	<i>Ptilotus schwartzii</i> var. <i>georgei</i>				Y	
	<i>Ptilotus schwartzii</i> var. <i>schwartzii</i>			Y		
	<i>Ptilotus sessilifolius</i>	Y				
	<i>Ptilotus sessilifolius</i> var. <i>sessilifolius</i>	Y				
	<i>Ptilotus</i> sp.					
Anthericaceae	Caesia talingka ms (species of interest)	Y				SOI
Apiaceae	<i>Platysace trachymenioides</i>	Y				
Apocynaceae	<i>Alyxia buxifolia</i>	Y				
Asclepiadaceae	<i>Marsdenia australis</i>	Y				
	<i>Rhyncharrhena linearis</i>	Y				
Asteraceae	<i>Brachyscome ?blackii</i>	Y				
	<i>Brachyscome iberidifolia</i>	Y				
	<i>Brachyscome</i> sp.					
	<i>Centipeda pleiocephala</i>	Y				
	<i>Chrysocephalum apiculatum</i>	Y				
	<i>Chrysocephalum puteale</i>	Y				
	<i>Cratystylis conocephala</i>		Y			
	<i>Cratystylis subspinescens</i>	Y				
	<i>Leucochrysum fitzgibbonii</i>	Y				
	Olearia arida (Priority 2)	Y				P2
	<i>Olearia exiguifolia</i>	Y				
	<i>Olearia incana</i>	Y				
	<i>Olearia muelleri</i>	Y				
	<i>Olearia subspicata</i>	Y				
	<i>Podolepis capillaris</i>	Y				
	<i>Rhodanthe ?floribunda</i>	Y				
	<i>Rhodanthe floribunda</i>	Y				
	<i>Rhodanthe haigii</i>	Y				
	<i>Rutidosia helichrysoides</i>	Y				
	<i>Schoenia ayersii</i>	Y				
<i>Schoenia cassiniana</i>	Y					
<i>Streptoglossa liatroides</i>	Y					
<i>Vittadinia dissecta</i> var. <i>hirta</i>				Y		
<i>Vittadinia eremaea</i>	Y					
<i>Vittadinia</i> sp.						
Boraginaceae	<i>Halgania cyanea</i>	Y				
	<i>Halgania cyanea</i> var. <i>Allambi Stn</i> (B.W. Strong 676)	Y				
	<i>Halgania integerrima</i>	Y				
	<i>Halgania</i> sp.					
Brassicaceae	*Carrichtera annua	Y				
Caesalpiniaceae	<i>Petalostylis cassioides</i>	Y				



Family	Name	GVD	NUL	COO	MUR	P / RE / SOI
	<i>Senna artemisioides</i> subsp. <i>filifolia</i>	Y				
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	Y				
	<i>Senna artemisioides</i> subsp. <i>petiolaris</i>	Y				
	<i>Senna artemisioides</i> subsp. <i>x artemisioides</i>	Y				
	<i>Senna cardiosperma</i>	Y				
	<i>Senna pleurocarpa</i> var. <i>pleurocarpa</i>	Y				
Casuarinaceae	<i>Allocasuarina ?helmsii</i>	Y				
	<i>Allocasuarina acutivalvis</i>	Y				
	<i>Allocasuarina campestris</i>			Y		RE
	<i>Allocasuarina helmsii</i>	Y				
	<i>Allocasuarina spinosissima</i>	Y				
	<i>Casuarina ?pauper</i>	Y				
	<i>Casuarina pauper</i>	Y				
Chenopodiaceae	<i>Atriplex ?vesicaria</i>	Y				
	<i>Atriplex bunburyana</i>	Y				
	<i>Atriplex nummularia</i>		Y			
	<i>Atriplex vesicaria</i> subsp. <i>appendiculata</i>	Y				
	<i>Dysphania kalpari</i>	Y				
	<i>Enchylaena tomentosa</i>	Y				
	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Y				
	<i>Maireana ?georgei</i>	Y				
	<i>Maireana appressa</i>			Y		
	<i>Maireana erioclada</i>		Y			
	<i>Maireana georgei</i>	Y				
	<i>Maireana pyramidata</i>	Y				
	<i>Maireana radiata</i>	Y				
	<i>Maireana sedifolia</i>	Y				
	<i>Maireana suaedifolia</i>	Y				
	<i>Maireana trichoptera</i>	Y				
	<i>Maireana triptera</i>	Y				
	<i>Maireana turbinata</i>	Y				
	<i>Maireana villosa</i>	Y				
	<i>Rhagodia ?eremaea</i>	Y				
	<i>Rhagodia drummondii</i>	Y				
	<i>Rhagodia eremaea</i>	Y				
	<i>Rhagodia</i> sp.					
	<i>Rhagodia spinescens</i>	Y				
	<i>Salsola australis</i>	Y				
	<i>Salsola tragus</i>	Y				
	<i>Sclerolaena convexula</i>	Y				
	<i>Sclerolaena diacantha</i>	Y				
	<i>Sclerolaena obliquicuspis</i>		Y			
	<i>Sclerolaena patenticuspis</i>	Y				
Convolvulaceae	<i>Bonamia erecta</i>	Y				
	<i>Bonamia rosea</i>	Y				
	<i>Convolvulus remotus</i>		Y			
Cupressaceae	<i>Callitris columellaris</i>	Y				



Family	Name	GVD	NUL	COO	MUR	P / RE / SOI
	<i>Callitris preissii</i>	Y				
Cyperaceae	<i>Caustis dioica</i>	Y				
	<i>Chrysitrix distigmatosa</i>	Y				
	<i>Schoenus subaphyllus</i>	Y				
Dasypogonaceae	<i>Lomandra leucocephala</i> subsp. <i>robusta</i>	Y				
Dilleniaceae	<i>Hibbertia exasperata</i>	Y				
Epacridaceae	<i>Styphelia intertexta</i>	Y				
Euphorbiaceae	<i>Adriana urticoides</i> var. <i>hookeri</i>					RE
	<i>Adriana urticoides</i> var. <i>urticoides</i>	Y				
	<i>Bertya dimerostigma</i>	Y				
	<i>Calycopeplus paucifolius</i>			Y		
	<i>Euphorbia drummondii</i>	Y				
	<i>Euphorbia tannensis</i>	Y				
	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	Y				
	<i>Monotaxis luteiflora</i>	Y				
Geraniaceae	<i>Erodium cygnorum</i>	Y				
Goodeniaceae	<i>Brunonia australis</i>	Y				P1
	<i>Dampiera eriantha</i> (Priority)	Y				
	<i>Dampiera lavandulacea</i>	Y				
	<i>Dampiera roycei</i>	Y				
	<i>Dampiera stenophylla</i>	Y				
	<i>Dampiera tomentosa</i>	Y				
	<i>Goodenia ?glandulosa</i>	Y				
	<i>Goodenia ?triodiophila</i>	Y				
	<i>Goodenia elderi</i>	Y				
	<i>Goodenia glandulosa</i>	Y				
	<i>Goodenia havilandii</i>	Y				
	<i>Goodenia ramelii</i>	Y				
	<i>Goodenia triodiophila</i>	Y				
	<i>Goodenia xanthosperma</i>	Y				
	<i>Lechenaultia striata</i>	Y				
	<i>Scaevola ?basedowii</i>	Y				
	<i>Scaevola basedowii</i>	Y				
	<i>Scaevola parvifolia</i>	Y				
	<i>Scaevola parvifolia</i> subsp. <i>parvifolia</i>	Y				
	<i>Scaevola restiacea</i> subsp. <i>divaricata</i>			Y		
<i>Scaevola spinescens</i>	Y					
Gyrostemonaceae	<i>Codonocarpus cotinifolius</i>	Y				
	<i>Gyrostemon ramulosus</i>	Y				
Haloragaceae	<i>Glischrocaryon aureum</i>	Y				
	<i>Gonocarpus confertifolius</i>	Y				
	<i>Haloragis trigonocarpa</i>	Y				
Lamiaceae	<i>Dicrastylis brunnea</i>	Y				P3 P2
	<i>Dicrastylis cundeeleensis</i>	Y				
	<i>Dicrastylis nicholasii</i>	Y				
	<i>Dicrastylis parvifolia</i>	Y				
	<i>Dicrastylis</i> sp.					



Family	Name	GVD	NUL	COO	MUR	P / RE / SOI	
	<i>Hemiphora elderi</i>	Y				P3	
	<i>Microcorys macredieana</i>	Y					
	<i>Newcastelia bracteosa</i>	Y					
	<i>Newcastelia hexarrhena</i>	Y				P2	
	<i>Physopsis chrysotricha</i>	Y					
	<i>Pityrodia lepidota</i>	Y					
	<i>Pityrodia loricata</i>	Y					
		<i>Prostanthera semiteres</i> subsp. <i>semiteres</i>			Y		
		<i>Prostanthera sericea</i>	Y				
		<i>Westringia cephalantha</i>	Y				
		<i>Westringia rigida</i>	Y				
Lauraceae	<i>Cassythia melantha</i>	Y					
Loganiaceae	<i>Logania nuda</i>	Y					
Loranthaceae	<i>Amyema fitzgeraldii</i>	Y					
	<i>Amyema miquelii</i>	Y					
	<i>Amyema preissii</i>	Y					
Malvaceae	<i>Abutilon leucopetalum</i>	Y					
	<i>Abutilon otocarpum</i>	Y					
	<i>Alyogyne pinoniana</i>	Y					
	<i>Radyera farragei</i>		Y				
	<i>Sida ?fibulifera</i>	Y					
	<i>Sida ?spodochroma</i>	Y					
	<i>Sida arenicola</i>	Y					
	<i>Sida calyxhymenia</i>	Y					
	<i>Sida fibulifera</i>	Y					
	<i>Sida phaeotricha</i>	Y					
	<i>Sida spodochroma</i>	Y					
Mimosaceae	<i>Acacia acanthoclada</i>	Y					
	<i>Acacia acanthoclada</i> subsp. <i>acanthoclada</i>	Y					
	<i>Acacia andrewsii</i>			Y			
	<i>Acacia aneura</i> var. <i>aneura</i>	Y					
	<i>Acacia aneura</i> var. <i>argentea</i>	Y					
	<i>Acacia aneura</i> var. <i>intermedia</i>	Y					
	<i>Acacia aneura</i> var. <i>major</i>	Y					
	<i>Acacia aneura</i> var. <i>microcarpa</i>	Y					
	<i>Acacia burkittii</i>	Y					
	<i>Acacia camptoclada</i>	Y					
	<i>Acacia colletioides</i>	Y					
	<i>Acacia desertorum</i> var. <i>desertorum</i>	Y					
	<i>Acacia eremophila</i> var. <i>eremophila</i>			Y			
	<i>Acacia fragilis</i>	Y					
	<i>Acacia gilesiana</i>	Y					
	<i>Acacia helmsiana</i>	Y					
	<i>Acacia hemiteles</i>	Y					
	<i>Acacia heteroneura</i> var. <i>jutsonii</i>	Y					
	<i>Acacia inaequiloba</i>	Y					
	<i>Acacia jamesiana</i>	Y					



Family	Name	GVD	NUL	COO	MUR	P / RE / SOI
	<i>Acacia jennerae</i>	Y				
	<i>Acacia kempeana</i>	Y				
	<i>Acacia ligulata</i>	Y				
	<i>Acacia murrayana</i>	Y				
	<i>Acacia nyssophylla</i>	Y				
	<i>Acacia oswaldii</i>	Y				
	<i>Acacia prainii</i>	Y				
	<i>Acacia ramulosa</i> var. <i>ramulosa</i>	Y				
	<i>Acacia rendlei</i>	Y				
	<i>Acacia rhodophloia</i>	Y				
	<i>Acacia rigens</i>	Y				
	<i>Acacia sibina</i>	Y				
	<i>Acacia</i> sp.					
	<i>Acacia tetragonophylla</i>	Y				
	<i>Acacia xerophila</i> var. <i>xerophila</i>	Y				
Myoporaceae	<i>Eremophila ?alternifolia</i>	Y				?P2
	<i>Eremophila ?falcata</i>	Y				
	<i>Eremophila ?glabra</i>	Y				
	<i>Eremophila ?glabra</i> var. <i>albicans</i>	Y				
	<i>Eremophila ?latrobei</i>	Y				
	<i>Eremophila ?undulata</i>	Y				
	<i>Eremophila alternifolia</i>	Y				
	<i>Eremophila battii</i>	Y				
	<i>Eremophila decipiens</i> subsp. <i>decipiens</i>	Y				
	<i>Eremophila deserti</i>			Y		
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	Y				
	<i>Eremophila georgei</i>	Y				
	<i>Eremophila gilesii</i> subsp. <i>?variabilis</i>	Y				
	<i>Eremophila gilesii</i> subsp. <i>variabilis</i>	Y				
	<i>Eremophila glabra</i>	Y				
	<i>Eremophila glabra</i> subsp. <i>albicans</i>	Y				
	<i>Eremophila glabra</i> subsp. <i>glabra</i>	Y				
	<i>Eremophila ionantha</i>			Y		
	<i>Eremophila latrobei</i> subsp. <i>glabra</i>	Y				
	<i>Eremophila latrobei</i> subsp. <i>latrobei</i>	Y				
	<i>Eremophila longifolia</i>	Y				
	<i>Eremophila maculata</i> subsp. <i>brevifolia</i>			Y		
	<i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>	Y				
	<i>Eremophila paisleyi</i>	Y				
	<i>Eremophila paisleyi</i> subsp. <i>paisleyi</i>	Y				
	<i>Eremophila platythamnos</i> subsp. <i>platythamnos</i>	Y				
	<i>Eremophila punctata</i>	Y				
	<i>Eremophila saligna</i>			Y		
	<i>Eremophila scoparia</i>	Y				
	<i>Eremophila serrulata</i>	Y				
	<i>Eremophila</i> sp.					



Family	Name	GVD	NUL	COO	MUR	P / RE / SOI
	<i>?Eremophila</i> sp.					
	<i>Myoporum platycarpum</i> subsp. <i>platycarpum</i>		Y			
Myrtaceae	<i>Aluta maisonneuvei</i> subsp. <i>auriculata</i>	Y				P2
	Baekkea sp. Gt. Victoria Desert (A.S. Weston 14813)	Y				
	<i>Calothamnus gilesii</i>	Y				
	<i>Enekbatus eremaeus</i>	Y				
	<i>Eucalyptus ?gracilis</i>	Y				
	<i>Eucalyptus ?mannensis</i>	Y				
	<i>Eucalyptus ?rigidula</i>	Y				
	<i>Eucalyptus ?sheathiana</i>	Y				
	<i>Eucalyptus ?youngiana</i>	Y				
	<i>Eucalyptus ceratocorys</i>	Y				
	<i>Eucalyptus concinna</i>	Y				
	<i>Eucalyptus cylindrocarpa</i>	Y				
	<i>Eucalyptus ebbanoensis</i> subsp. <i>glauciramula</i>	Y				
	<i>Eucalyptus eremicola</i> subsp. <i>peeneri</i>	Y				
	<i>Eucalyptus gamophylla</i>	Y				
	<i>Eucalyptus gongylocarpa</i>	Y				
	<i>Eucalyptus gracilis</i>	Y				
	<i>Eucalyptus gypsophila</i>	Y				
	<i>Eucalyptus horistes</i>	Y				
	<i>Eucalyptus hypolaena</i>	Y				
	<i>Eucalyptus intertexta</i>	Y				
	<i>Eucalyptus leptophylla</i>	Y				
	<i>Eucalyptus leptopoda</i> subsp. <i>elevata</i>	Y				
	<i>Eucalyptus mannensis</i> subsp. <i>mannensis</i>	Y				
	<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>		Y			
	<i>Eucalyptus optima</i>	Y				
	<i>Eucalyptus orbifolia</i>	Y				
	<i>Eucalyptus platycorys</i>	Y				
	<i>Eucalyptus rigidula</i>	Y				
	<i>Eucalyptus rosacea</i>	Y				
	<i>Eucalyptus salicola</i>	Y				
	<i>Eucalyptus salmonophloia</i>	Y				
	<i>Eucalyptus sheathiana</i>	Y				
	<i>Eucalyptus socialis</i> subsp. <i>socialis</i>	Y				
	<i>Eucalyptus socialis</i> subsp. <i>victoriensis</i>	Y				
	<i>Eucalyptus</i> sp.					
	<i>Eucalyptus trivalva</i>	Y				
	<i>Eucalyptus websteriana</i> subsp. <i>websteriana</i>	Y				
	<i>Eucalyptus youngiana</i>	Y				
	<i>Homalocalyx thryptomenoides</i>	Y				
	<i>Leptospermum fastigiatum</i>	Y				
Malleostemon sp. Officer Basin (D. Pearson 350)	Y				P2	



Family	Name	GVD	NUL	COO	MUR	P / RE / SOI
	<i>Melaleuca eleuterostachya</i>	Y				
	<i>Melaleuca zeteticorum</i>	Y				
	<i>Micromyrtus stenocalyx</i>	Y				P2
	<i>Thryptomene biseriata</i>	Y				
	<i>Verticordia helmsii</i>	Y				
Oleaceae	<i>Jasminum didymum</i> subsp. <i>lineare</i>	Y				
Papilionaceae	<i>Cullen patens</i>			Y		
	<i>Daviesia benthamii</i> subsp. <i>acanthoclona</i>	Y				P4
	<i>Daviesia grahamii</i>	Y				
	<i>Daviesia purpurascens</i>	Y				
	<i>Daviesia</i> sp.					
	<i>Daviesia</i> sp. Kanandah (R. Davis 10604)	Y				
	<i>Daviesia ulicifolia</i> subsp. <i>aridicola</i>	Y				
	<i>Gompholobium gompholobioides</i>	Y				
	<i>Indigofera boviperda</i>				Y	
	<i>Indigofera georgei</i>	Y				
	<i>Isotropis canescens</i>	Y				P2
	<i>Jacksonia arida</i>	Y				
	<i>Leptosema aculeatum</i>	Y				
	<i>Leptosema chambersii</i>	Y				
	<i>Leptosema daviesioides</i>				Y	
	<i>Lotus cruentus</i>		Y			
	<i>Mirbelia depressa</i>	Y				
	<i>Mirbelia rhagodioides</i>	Y				
	<i>Mirbelia seorsifolia</i>	Y				
	<i>Otion simplicifolium</i>	Y				
	PAPILIONACEAE sp.					
	<i>Phyllota luehmannii</i>	Y				
	<i>Swainsona colutoides</i>				Y	
<i>Swainsona formosa</i>	Y					
<i>Templetonia aculeata</i>	Y					
<i>Templetonia egena</i>	Y					
Phormiaceae	<i>Dianella revoluta</i> var. <i>divaricata</i>	Y				
Pittosporaceae	<i>Marianthus bicolor</i>	Y				
	<i>Pittosporum angustifolium</i>	Y				
Poaceae	? <i>Agrostis</i> sp.					
	<i>Amphipogon caricinus</i> var. <i>caricinus</i>	Y				
	<i>Aristida contorta</i>	Y				
	<i>Aristida holathera</i>	Y				
	<i>Aristida holathera</i> var. <i>holathera</i>	Y				
	<i>Austrostipa nitida</i>	Y				
	<i>Austrostipa platychaeta</i>		Y			
	<i>Austrostipa semibarbata</i>		Y			
	<i>Enneapogon avenaceus</i>		Y			
	<i>Enneapogon caerulescens</i>	Y				
	<i>Enneapogon cylindricus</i>	Y				
	<i>Enteropogon ramosus</i>	Y				



Family	Name	GVD	NUL	COO	MUR	P / RE / SOI
	<i>Eragrostis dielsii</i>	Y				
	<i>Eragrostis eriopoda</i>	Y				
	<i>Eragrostis setifolia</i>	Y				
	<i>Eragrostis</i> sp.					
	<i>Eragrostis xerophila</i>	Y				
	<i>Eriachne helmsii</i>	Y				
	<i>Eriachne mucronata</i>	Y				
	<i>Monachather paradoxus</i>	Y				
	<i>Paspalidium basicladum</i>	Y				
	<i>Paspalidium clementii</i>	Y				
	<i>Paspalidium constrictum</i>		Y			
	<i>Paspalidium reflexum</i>	Y				
	POACEAE sp.					
	<i>Triodia ? desertorum</i>	Y				
	<i>Triodia ?rigidissima</i>	Y				
	<i>Triodia basedowii</i>	Y				
	<i>Triodia desertorum</i>	Y				
	<i>Triodia irritans</i>			Y		
	<i>Triodia rigidissima</i>	Y				
	<i>Triodia scariosa</i>	Y				
	<i>Triodia schinzii</i>	Y				
	<i>Triodia</i> sp.					
	<i>Triodia tomentosa</i>	Y				
Polygalaceae	<i>Comesperma viscidulum</i>	Y				P4
	<i>Muehlenbeckia florulenta</i>		Y			
	<i>Calandrinia</i> sp.					
Proteaceae	<i>Banksia elderiana</i>	Y				
	<i>Grevillea ?nematophylla</i>	Y				
	<i>Grevillea acacioides</i>	Y				
	<i>Grevillea acuaria</i>	Y				
	<i>Grevillea didymobotrya</i> subsp. <i>didymobotrya</i>	Y				
	<i>Grevillea huegelii</i>	Y				
	<i>Grevillea juncifolia</i> subsp. <i>temulenta</i>	Y				
	<i>Grevillea nematophylla</i> subsp. <i>planicosta</i>	Y				
	<i>Grevillea sarissa</i>	Y				
	<i>Grevillea sarissa</i> subsp. <i>anfractifolia</i>	Y				
	<i>Grevillea secunda</i>	Y				P2
	<i>Grevillea stenobotrya</i>	Y				
	<i>Hakea ?rhombales</i>				Y	
	<i>Hakea francisiana</i>	Y				
	<i>Hakea lorea</i> subsp. <i>lorea</i>	Y				
	<i>Persoonia coriacea</i>	Y				
Restionaceae	<i>Lepidobolus deserti</i>	Y				P4
Rhamnaceae	<i>Cryptandra aridicola</i>	Y				
	<i>Cryptandra distigma</i>	Y				
Rubiaceae	<i>Pomax</i> sp. desert (A.S. George 11968)	Y				
	<i>Psyrdrax ?ammophila</i>	Y				RE



Family	Name	GVD	NUL	COO	MUR	P / RE / SOI
	<i>Psydrax latifolia</i>	Y				
	<i>Psydrax suaveolens</i>	Y				
Rutaceae	<i>Geijera linearifolia</i>	Y				
Santalaceae	<i>Anthobolus leptomerioides</i>	Y				
	<i>Exocarpos aphyllus</i>	Y				
	<i>Exocarpos sparteus</i>	Y				
	<i>Santalum acuminatum</i>	Y				
	<i>Santalum lanceolatum</i>	Y				
	<i>Santalum spicatum</i>	Y				
Sapindaceae	<i>Alectryon oleifolius</i> subsp. <i>canescens</i>	Y				
	<i>Dodonaea adenophora</i>	Y				
	<i>Dodonaea lobulata</i>	Y				
	<i>Dodonaea microzyga</i> var. <i>acrolobata</i>	Y				
	<i>Dodonaea stenozyga</i>	Y				
	<i>Dodonaea viscosa</i> subsp. ? <i>angustissima</i>	Y				
	<i>Dodonaea viscosa</i> subsp. <i>angustissima</i>	Y				
Solanaceae	<i>Anthotroche pannosa</i>	Y				
	<i>Duboisia hopwoodii</i>	Y				
	<i>Lycium australe</i>		Y			
	<i>Nicotiana rosulata</i> subsp. <i>rosulata</i>	Y				
	<i>Solanum ? ellipticum</i>		Y			
	<i>Solanum ? chippendalei</i>					
	<i>Solanum ellipticum</i>		Y			
	<i>Solanum lasiophyllum</i>	Y				
	<i>Solanum nummularium</i>	Y				
	<i>Solanum orbiculatum</i>	Y				
	<i>Solanum orbiculatum</i> subsp. <i>orbiculatum</i>	Y				
	<i>Solanum plicatile</i>	Y				
Stackhousiaceae	<i>Stackhousia megaloptera</i>	Y				
Sterculiaceae	<i>Commersonia melanopetala</i>	Y				
	<i>Hannafordia bissillii</i> subsp. <i>bissillii</i>	Y				
	<i>Hannafordia quadrivalvis</i> subsp. <i>quadrivalvis</i>				Y	
	<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	Y				
	<i>Rulingia crauophylla</i>			Y		
Stylidiaceae	<i>Stylidium induratum</i>	Y				
	<i>Stylidium limbatum</i>	Y				
Thymelaeaceae	<i>Pimelea microcephala</i> subsp. <i>microcephala</i>	Y				
	<i>Pimelea trichostachya</i>	Y				
Violaceae	<i>Hybanthus floribundus</i> subsp. <i>floribundus</i>	Y				
Zygophyllaceae	<i>Zygophyllum ? apiculatum</i>	Y				
	<i>Zygophyllum apiculatum</i>	Y				
	<i>Zygophyllum aurantiacum</i>	Y				
	<i>Zygophyllum aurantiacum</i> subsp. <i>aurantiacum</i>	Y				
	<i>Zygophyllum eremaeum</i>	Y				



Family	Name	GVD	NUL	COO	MUR	P / RE / SOI
	<i>Zygophyllum iodocarpum</i>	Y				
	<i>Zygophyllum ovatum</i>	Y				

Notes:

Column 3: GVD = Plants with FloraBase records for the Great Victoria Desert Bioregion

Column 4: NUL = Plants with FloraBase records for the Nullarbor Bioregion

Column 5: COO = Plants with FloraBase records for the Coolgardie Bioregion

Column 6: MUR = Plants with FloraBase records for the Murchison Bioregion

Column 7: P = Priority (and P1 – P4 indicates Priority ranking), RE = Range Extension, SOI = Species of Interest.



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APPENDIX C: Explanation of flora conservation codes



Commonwealth EPBC Act

Codes for threatened ecological communities protected by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Explanation of codes for Threatened Ecological Communities (TEC).

Code	Definition
PD: Presumed Totally Destroyed	An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future. An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant
CR: Critically Endangered	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated. An ecological community will be listed as <i>Critically Endangered</i> when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future.
EN: Endangered	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future. An ecological community will be listed as <i>Endangered</i> when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future.
VU: Vulnerable	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range. An ecological community will be listed as <i>Vulnerable</i> when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future.

Codes for flora species protected by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Explanation of Codes for Flora under the Commonwealth EPBC Act

Conservation Category	Definition
Critically Endangered	The species is facing an extremely high risk of extinction in the wild in the immediate future.
Endangered	The species is likely to become extinct unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate; or its numbers have been reduced to such a critical level, or its habitats have been so drastically reduced, that it is in immediate danger of extinction.
Vulnerable	Within the next 25 years, the species is likely to become endangered unless the circumstances and factors threatening its abundance, survival or evolutionary development cease to operate.
Extinct	A species is presumed extinct if it has not been located in the last 5 years, or it has not been located in the last 100years despite thorough searching.



Conservation Category	Definition
Extinct in the wild	The species is only known to survive in cultivation, in captivity or as a naturalised population well outside its past range or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a timeframe appropriate to its life cycle and form.
Conservation Dependent	The species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

DEC Priority Flora

Definition of Declared Rare and Priority flora categories.

Priority Category	Definition
Priority One Taxa with few, poorly known populations on threatened lands.	Taxa which are known from few specimens or sight records from one or a few localities, on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
Priority Two Taxa with few, poorly known populations on conservation lands.	Taxa which are known from few specimens or sight records from one or a few localities, on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna
Priority Three Taxa with several, poorly known populations, some on conservation lands.	Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
Priority Four Taxa in need of monitoring	Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could if present circumstances change. These taxa are usually represented on conservation lands.
Priority Five Taxa in need of monitoring	Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

(From Atkins, K.J., Declared Rare and Priority Flora List 2008(2), DEC)



Explanation of codes for Priority Ecological Communities (PEC).

Code	Definition
P1: Priority One	Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
P2: Priority Two	Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
P3: Priority Three	(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (ii) Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or; (iii) Communities made up of large, and/or widespread occurrences that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.
P4: Priority Four	Ecological communities that are adequately known, <i>Rare</i> but not threatened or meet criteria for <i>Near Threatened</i> , or that have been recently removed from the threatened list. These communities require regular monitoring. (a) <i>Rare</i> . Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands. (b) <i>Near Threatened</i> . Ecological communities that are considered to have been adequately surveyed and that do not qualify for <i>Conservation Dependent</i> , but that are close to qualifying for <i>Vulnerable</i> . (c) Ecological communities that have been removed from the list of threatened communities during the past five years.
P5: Priority Five	Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.



Explanation of codes for Declared Plants in Western Australia.

Priority	Requirements
P1 Prohibits movement	The movement of plants or their seeds is prohibited within the State. This prohibits the movement of contaminated machinery and produce, including livestock and fodder.
P2 Aim is to eradicate infestation	Treat all plants to destroy and prevent propagation each year until no plants remain. The infested area must be managed in such a way that prevents the spread of seed or plant parts on or in livestock, fodder, grain, vehicles and/or machinery.
P3 Aims to control infestation by reducing area and/or density of infestation	<p>The infested area must be managed in such a way that prevents the spread of seed or plant parts within and from the property, on or in livestock, fodder, grain, vehicles and/or machinery.</p> <p>Treat to destroy and prevent seed set for all plants:</p> <ul style="list-style-type: none"> • within 100 metres inside of the boundaries of the infestation. • within 50 metres of roads and high-water marks on waterways. • within 50 metres of sheds, stock yards and houses. <p>Treatment must be done prior to seed set each year.</p> <p>Of the remaining infested area:</p> <ul style="list-style-type: none"> • Where plant density is 1-10 per hectare, treat 100% of infestation. • Where plant density is 11-100 per hectare, treat 50% of infestation. • Where plant density is 101-1000 per hectare, treat 10% of infestation. <p>Properties with less than two hectares of infestation must treat the entire infestation.</p> <p>Additional areas may be ordered to be treated.</p>
P4 Aims to prevent infestation spreading beyond existing boundaries of infestation	<p>The infested area must be managed in such a way that prevents the spread of seed or plant parts within and from the property, on or in livestock, fodder, grain, vehicles and/or machinery.</p> <p>Treat to destroy and prevent seed set for all plants:</p> <ul style="list-style-type: none"> • within 100 metres inside of the boundaries of the infested property. • within 50 metres of roads and high-water marks on waterways. • within 50 metres of sheds, stock yards and houses. <p>Treatment must be done prior to seed set each year. Properties with less than two hectares of infestation must treat the entire infestation.</p> <p>Additional areas may be ordered to be treated.</p> <p>Special considerations:</p> <p>In the case of P4 infestations where they continue across property boundaries, there is no requirement to treat the relevant part of the property boundaries as long as the boundaries of the infestation as a whole are treated. There must be agreement between neighbours in relation to the treatment of these areas.</p>
P5	Infestations on public lands must be controlled.



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APPENDIX D: Declared Rare and Priority Flora potentially occurring in the Corridor



Declared Rare and Priority Flora with potential to occur within the Corridor

SPECIES	PRIORITY	LOCATION	HABITAT	LIKELIHOOD OF OCCURRENCE
<i>Conospermum toddii</i> (Proteaceae)	DRF	E of Argus Corner, N of Streich Mound, Queen Victoria Nature Reserve, Officer Basin airstrip, Yundagabbi, E of Ponton Creek.	Deep red-yellow sand of dunes	Possible as already recorded on dunes in the project area and dunes are present on some sections of Corridor.
<i>Eucalyptus articulata</i> (Myrtaceae)	DRF	E of Mulga Rockhole	In red sand on crest of dune, or on skeletal soil of rocky saprolite (decayed granite) ridge	Possible. Easily overlooked as similar to more common mallees. Has been collected at Plumridge Lakes NR (<i>ecologia</i> 2005a).
<i>Thryptomene wittweri</i> (Myrtaceae)	DRF	Mt Augustus, Mt Meharry, White Cliffs Station, E of Laverton.	Rocky slopes, cliff faces, breakaways in sandstone, ironstone, laterite	Unlikely as laterite and rocky habitat is not common along the Corridor.
<i>Micromyrtus helmsii</i> (Myrtaceae)	P1	Blackstone South Rd	Tall sandhills	Possible. Although known records are limited to much further north east, it occurs in same habitat and similar vegetation to project area. This species could well be widespread but hitherto poorly known and collected.
<i>Philotheca linearis</i> (Rutaceae)	P1	WNW of Outcamp Well	Yellow sand, base of granite outcrop	Unlikely. This species has only been recorded at this one site. Granite outcrops do not occur in the Corridor.
<i>Philotheca tubiflora</i> (Rutaceae)	P1	Adam Range, Laverton – Cosmo Newbery Road, E of Lichman Well, Point Kidman, White Cliffs Station, Deeba Rock Hole	Rocky rises and hills; outcrops	Unlikely. Species has been previously collected further to the north than the project area on rocky rises, hills and outcrops, habitats not in current project area.



SPECIES	PRIORITY	LOCATION	HABITAT	LIKELIHOOD OF OCCURRENCE
<i>Verticordia mirabilis</i> (Myrtaceae)	P1	S of Warburton	Skeletal soil, laterite, sandstone, shale, rocky outcrops	Unlikely. Recorded NE of the Corridor; habitat of this type is not common within the Corridor.
<i>Labichea deserticola</i> (Caesalpiaceae)	P1	Victoria Desert Camp 54	Sandstone ridges	Unlikely. This species favours sandstone ridges not occurring along Corridor. Specimens held in the State Herbarium were collected in 1891.
<i>Dampiera eriantha</i> (Goodeniaceae)	P1	Victoria Desert Camp 54		Possible; habitat type unknown.
<i>Lechenaultia aphylla</i> (Goodeniaceae)	P1	Roadside between Cosmo Newbery and Laverton	Red sands; slopes, drainage areas	Possible, habitat similar to that in the study site.
<i>Eremophila aureivisca</i> (Myoporaceae)	P1	SE of Rason Lake	Stony skeletal red clay. Between breakaways and clay pans	Unlikely. This habitat not common along the Corridor.
<i>Trachymene pyrophila</i> (Apiaceae)	P2	SW of Nippon Junction, Queen Victoria Springs Nature reserve, Queen Victoria Springs, NNE Streich Mound	Yellow or orange sand. Sandplains; germinating after fire or other disturbances such as mining.	Possible; especially as some areas of the corridor have been burnt.
<i>Olearia arida</i> (Asteraceae)	P2	N of Plumridge Lakes Reserve, Officer Basin Airstrip, W of Plumridge Lakes, S of Neale Junction	Red or yellow sand; undulating low rises	Likely. Has been recorded at Tropicana and similar habitat and vegetation occurs along the Corridor.
<i>Vittadinia pustulata</i>	P2	Plumridge Lakes Nature Reserve airstrip,		Possible; habitat type unknown
<i>Dicrastylis nicholasii</i> (Lamiaceae)	P2	Plumridge Lakes Reserve, W boundary fence, Kanada Station	Red sandy loam	Highly likely. Has been recorded at Tropicana and similar habitat and vegetation occurs along the Corridor.
<i>Physopsis chrysotricha</i> (Lamiaceae)	P2	Victoria Desert, N to NNE of Queen Victoria Springs Nature Reserve	Red sand over calcrete	Possible; has been collected relatively close to the Corridor.



SPECIES	PRIORITY	LOCATION	HABITAT	LIKELIHOOD OF OCCURRENCE
<i>Eremophila revoluta</i> (Myoporaceae)	P2	E of Mt Everhard, Point Lilian, road to Eagle Bore, S of Eagle Bore campsite, Mt William Lambert, SW of Young Range, SSW of Charlies Knob, E of Mungilli Claypan	Rocky clay, red sand. Rocky hills and plains, sand plains	Unlikely. Rocky hills and slopes not common along the Corridor. Previous collections made further to the north.
<i>Eremophila undulata</i> (Myoporaceae)	P2	Neale Breakaway, Lake Helms, S of Neale Junction	Red-brown clay loam, sand	Possible. Habitat type similar to that found along the Corridor. May be found in association with mallee eucalypts and <i>Triodia</i> .
<i>Baeckea</i> sp. Gt Victoria Desert (Myrtaceae)	P2	N of Streich Mound in Queen Victoria Spring Nature Reserve, Officer Basin	Yellow sand, gently sloping sand plain	Likely. Occurs in vegetation type and habitat similar to that along the Corridor. Has been collected at Plumridge Lakes NR.
<i>Calytrix warburtonensis</i> (Myrtaceae)	P2	E of Neale Junction, SW of Warburton, Muggan Rockhole	Rocky hills; breakaways	Unlikely. Occurrence of rocky hills and breakaways along the Corridor is low. Previous collections made further to the north.
<i>Malleostemon</i> sp. Officer Basin (Myrtaceae)	P2	ENE of Queen Victoria Spring, SE of Officer Basin,	Yellow sand, dune slopes	Possible. Similar dunal habitat occurs along the Corridor.
<i>Isotropis canescens</i> (Papilionaceae)	P2	Lochada Station, NNE of Queen Victoria Spring, N of Cundeelee,	Yellow clayey sand, sand plains	Possible. Species has been collected previously from Plumridge Lakes NR



SPECIES	PRIORITY	LOCATION	HABITAT	LIKELIHOOD OF OCCURRENCE
<i>Grevillea secunda</i> (Proteaceae)	P2	NE of Queen Victoria Spring, Streich Mound, Queen Victoria Spring Nature Reserve, Officer Basin, Doney Lagoon	Yellow or red sand. Sand dunes, sand plains	Highly likely. Species found predominantly on yellow or red sand dunes and plains common along the Corridor. Has been collected at Plumridge Lakes NR.
<i>Calotis latiuscula</i> (Asteraceae)	P3	Mount Aloysius, Circus Hill, Sir Fredrick Range, Rebecca Creek, W of Ridge Bore, W of Mount Delphine, Giles, E of Warburton	Sand, loam. Rocky hillsides, floodplains, rocky creeks or river beds	Unlikely. Recorded further N of project area, and rocky habitat uncommon along Corridor.
<i>Phyllanthus baeckeoides</i> (Euphorbiaceae)	P3	SE of Laverton, Sparrow Well, Windimurra Station, E of Laverton on the White Cliffs road.	Red lateritic and sandy clay soils. Granite outcrops.	Unlikely. Suitable soils and laterite don't occur along the Corridor.
<i>Microcorys macredieana</i> (Lamiaceae)	P3	Queen Victoria Spring, Bounty Powerline, N of Steich Mound, NNE Queen Victoria Spring, SE of Angus Corner, E of Officer Basin,	Yellow sand. Dunes and sand plains	Likely. Species has been found in similar dune habitat at Tropicana in a number of surveys.
<i>Micromyrtus stenocalyx</i> (Myrtaceae)	P3	Plumridge Lakes Nature Reserve, Queen Victoria Spring, PNC Road, Queen Victoria Spring Nature Reserve, NE of Cundelee	Yellow to red sand, dune slopes and crest	Highly likely. Species has previously been collected from sites at Tropicana. Similar dune habitat occurs along the Corridor.
<i>Calytrix praecipua</i> (Myrtaceae)	P3	Virgin Spring, De La Poer Nature Reserve, Niagara Dam, E of Erong Homestead, Carnarvon Range, E of Bandy Station, E of Laverton on White Cliffs Road, Bubble Well	Skeletal sandy soils over granite or laterite. Breakaways, outcrops	Unlikely. Granite and laterite are uncommon along the Corridor, as are breakaways.
<i>Eucalyptus pimpiniana</i> (Myrtaceae)	P3	Queen Victoria Springs Nature Reserve, E and N of Mulga Rockhole, S of Kigella Rocks, SW of Wanna Lakes, N of Watson	Red sand, sand dunes and plains	Highly likely. Species collected relatively close to the Corridor. Similar habitats occur along the Corridor.



SPECIES	PRIORITY	LOCATION	HABITAT	LIKELIHOOD OF OCCURRENCE
<i>Eucalyptus sparsa</i> (Myrtaceae)	P3	Blackstone to Mulga Park Road, Skirmish Hill Road	Red sand, sand dunes	Unlikely. While habitat along the Corridor suggests this species could be found, it has been collected much further to the N and E of the Corridor.
<i>Melaleuca apostiba</i> (Myrtaceae)	P3	E of Lake Wells, S of Lake Minigwal, Point Bot to Lake Rason Road, Officer Basin	Deep red sand, edge of claypan	Unlikely. Not many claypans along the Corridor.
<i>Calandrinia porifera</i> (Portulacaceae)	P3	NE of Mukinbudin, Yanneymooning Nature Reserve, SW of Muntagin, SSE of Duri, Between Cundeelee Mission and Queen Victoria Spring	Granite rocks	Low. Granite uncommon along the Corridor. However, this species has been recorded within the Queen Victoria Spring Nature Reserve, close to the survey area.
<i>Acacia eremophila</i> numerous-nerved variant (Mimosaceae)	P3	S of Neale Junction, E of Boingaring Rock, S end of Plumridge Lakes, W of Balladonia	Sandy soils, flats	Possible. Been collected from similar habitats in the Tropicana area.
<i>Eremophila dendritica</i>	P3	E of Rawlinna, proposed Ida Valley Conservation Park, Plumridge Lakes Nature Reserve,	Red and yellow sand or orange and brown clays over laterite. Flat plain.	Possible. Species has been collected previously from Plumridge Lakes NR
<i>Sauropus ramosissimus</i> (Euphorbiaceae)	P3	N of Leonora, SW of Warburton, NE of Laverton, Carnegie Station	Gravel over ironstone-laterite substrate, lateritic breakaway	Low. Laterite uncommon along the Corridor.
<i>Thryptomene nealensis</i> (Myrtaceae)	P3	Leinster, White Cliffs Station, Neale Junction, Great Victoria Desert	On duricrest lateritic breakaways in skeletal soils	Low. Laterite uncommon along the Corridor.



SPECIES	PRIORITY	LOCATION	HABITAT	LIKELIHOOD OF OCCURRENCE
<i>Daviesia purpurascens</i> (Papilionaceae)	P4	WNW of Queen Victoria Rock Road, Brookton – Corrigin Highway, Mt Jackson, W side of Midland Road, Namelcatchem, Mt Manning Range, Queen Victoria Spring Nature Reserve, Tamala Station, Aurora Range	Sandy or loamy soils over laterites. Flats, ridges	Unlikely. Laterite uncommon along the Corridor. However, it has been recorded in the Queen Victoria Spring Nature Reserve, and in the Tropicana project area.
<i>Comesperma viscidulum</i> (Polygalaceae)	P4	Little Sandy Desert, WNW of Lake Sunshine, Carnarvon Range, E of Cosmo Newbery, Officer Basin, Rawlinson Range	Sandstone breakaway, red gritty sand, dune crest, swale, rocky slopes	Possible. Specimens collected from similar habitats to those occurring along the Corridor – especially dunes.
<i>Lepidobolus deserti</i> (Restionaceae)	P4	Goongarrie Station, N of Queen Victoria Nature Reserve, Streich Mound, Kangaroo Hills Timber Reserve, S of Woolgangie, E of Queen Victoria Spring, SE of Queen Victoria Spring, E of Janies Well, Comet Vale	Yellow or orange sand. Sand dunes	Likely. Already recorded in the Tropicana operational area, and preferred dune habitat of species occurs along the Corridor.
<i>Eucalyptus nigrifunda</i> (Myrtaceae)	P4	Lilian Adcott Rock, SE of Mallee Hen Rocks, Mt Dennis region, SE of Laverton, NW of Coglia Well	Sandy clay, breakaways of decomposing granite	Unlikely. Decomposing granite breakaways uncommon along the Corridor.

Information sourced from FloraBase (Western Australian Herbarium, 2009) - listings for the Great Victoria Desert IBRA region.



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APPENDIX E: Priority Flora and species of conservation interest – locations and map/s



Priority Flora and species of potential conservation interest – locations

Priority species	Cover (%) / No. of plants	Zone		Site no. / Transect no. / Opp. coll.	Easting (mE)	Northing (mN)
<i>Dampiera eriantha</i> (P1)	N/A	51	J	⇒ Opp. coll.	655	6682
	N/A	51	J	Opp. coll.	646	6670
	N/A	51	J	⇒ 56	655	6688
	< 10 plants	51	J	⇒ 57	657	6688
	<10%	51	J	⇒ JN-T5 Between waypoints:-	655	6688
		51	J		655	6688
<i>Baeckea</i> sp. Great Victoria Desert (A.S. Weston 14813) (P2)	<10 plants	51	J	38	636	6652
	Isolated clumps	51	J	⇒ 65	665	6697
	Isolated clumps	51	J	69	646	6713
	<10%	51	J	74	652	6721
	<10%	51	J	75	653	6722
	<10 plants	51	J	77	654	6724
	Isolated clumps	51	J	81	655	6731
	10-20 plants	51	J	MH-T1	650	6684
	5 plants	51	J	MH-T2	639	6657
	15 plants	51	J	MH-T3	655	6734
	<10%	51	J	MH-T3	655	6734
	<10 plants	51	J	Opp. coll.	633	6639
	N/A	51	J	CT-T29	649	6674
<i>Dichrastylis nicholasii</i> (P2)	1 plant	51	J	Opp. coll.	635	6652
	Isolated plants	51	J	Opp. coll.	627	6608
	15 plants	51	J	20	628	6611
	<10 plants	51	J	21	628	6611
	<10 plants	51	J	CMC-T1 Between Waypoints:-	628	6612
		51	J		628	6612
	50 plants	51	J	Opp. coll.	633	6626205
	<10 plants	51	J	30	633	6633
	N/A	51	J	Opp. coll.	633	6636
	2 plants	51	J	32	633	6638
	<10 plants	51	J	34	633	6642
	<10 plants	51	J	CT-T24	633	6643
	1 plant	51	J	CT-T12	635	6652



Priority species	Cover (%) / No. of plants	Zone		Site no. / Transect no. / Opp. coll.	Easting (mE)	Northing (mN)
<i>Dichrastylis nicholasii</i> (P2)	34	51	J	39	636	6653
	5-10 plants	51	J	42	641	6660
	1 plant	51	J	42	641	6660
	N/A	51	J	CT-T26	641	6660
	Many	51	J	Opp. coll.	643	6663
	1 plant	51	J	CT-T18	644	6664
	4 plants	51	J	Opp. coll.	644	6665
	4 plants	51	J	44	644	6665
	N/A	51	J	CT-T7	646	6670
	N/A	51	J	↗CMC-T3	651	6678
		51	J	Between Waypoints:-	651	6678
	1000+ plants	51	J	↗CT-T29	661	6689
	200+ plants	51	J	104	649	6691
	Many	51	J	↗Opp. coll.	663	6692
	Isolated clumps	51	J	JN-T1	648	6696
	50+ plants	51	J	106	648	6696
	1000+ plants	51	J	↗CT-T30	668	6702
	100+	51	J	111	643	6708
	Many	51	J	Opp. coll.	643	6709
	Many	51	J	112	643	6710
	<10%	51	J	68	645	6713
	Many	51	J	69	646	6713
	Many	51	J	Opp. coll.	646	6713
	N/A	51	J	CT-T40	654	6723
	<10 plants	51	J	86	657	6740
	<10 plants	51	J	87	657	6742
	<10%	51	J	88	656	6744
	<10 plants	51	J	91	655	6750
	1000+ plants	51	J	CT-T37 Between Waypoints:-	655604.6	6750
		51	J		655	6751
Isolated clumps	51	J	90	655	6751	
<i>Grevillea secunda</i> (P2)	N/A	51	J	CT-T17	615	6580
	Isolated clumps	51	J	24	632	6617
	<10 plants	51	J	26	633	6625
	<10 plants	51	J	30	633	6633



Priority species	Cover (%) / No. of plants	Zone		Site no. / Transect no. / Opp. coll.	Easting (mE)	Northing (mN)
<i>Grevillea secunda</i> (P2)	1 plant	51	J	Opp. coll.	635	6651
	<10 plants	51	J	37	635	6651
	1 plant	51	J	Opp. coll.	635	6651
	N/A	51	J	CT-T15	635	6651
	N/A	51	J	CT-T15	635	6652
	10 plants	51	J	38	636	6652
	80 plants	51	J	46	646	6668
	80 plants	51	J	Opp. coll.	646	6668
	3 plants	51	J	↻ Opp. coll.	655	6688
	<10 plants	51	J	↻ 57	657	6688
N/A	51	J	CT-T39 Between Waypoints:-	657	6736	
	51	J		657	6735	
<i>Isotropis canescens</i> (P2)	1 plant			CT-T17	642	6660
<i>Malleostemon</i> sp. Officer Basin (P2)	<10%	51	J	↻ 55	655	6685
	2 plants	51	J	↻ 59	660	6689
<i>Olearia arida</i> (P2)	1 plant	51	J	CT-T17	615	6580
	Isolated clumps	51	J	21	628	6611
	15 plants	51	J	CT-T21	630	6615
	2 plants	51	J	CT-T22	633	6626
	1 plant	51	J	CT-T24	635	6651
	1 plant	51	J	Opp. coll.	641	6660
	3 plants	51	J	CT-T28	646	6670
	14 plants	51	J	↻ Opp. coll.	652	6680
	2 plants	51	J	↻ Opp. coll.	655	6682
	100 + plants	51	J	↻ CT-T30	655	6685
	1 plant	51	J	↻ Opp. coll.	659	6689
	3 plants	51	J	↻ Opp. coll.	665	6697
	15 plants	51	J	↻ Opp. coll.	666	6698
	1 plant	51	J	CT-T39	653	6717
	2 plants	51	J	Opp. coll.	657	6736
	<10%	51	J	87	657	6742
<i>Physopsis chrysotricha</i> (P2)	Isolated clumps	51	J	107	647	6698
	<10 plants	51	J	Opp. coll.	639	6657
	N/A	51	J	↻ Opp. coll.	651	6677
<i>Dicrastylis cundeeleensis</i> (P3)	30-70%	51	J	23	630	6615
	<10 plants	51	J	42	641	6660
	10-30%	51	J	45	645	6666



Priority species	Cover (%) / No. of plants	Zone		Site no. / Transect no. / Opp. coll.	Easting (mE)	Northing (mN)
<i>Dicrasyliis cundeeleensis</i> (P3)	Isolated clumps <10 plants	51	J	↻51	651	6678
	Isolated clumps <10 plants	51	J	69	646	6713
	Isolated clumps <10 plants	51	J	74	652	6721
	Isolated clumps <10% cover	51	J	98	650	6678
	Isolated clumps <10% cover	51	J	↻CMC-T3	651	6678
	Isolated clumps <10% cover	51	J	CT-T17 Between Waypoints:-	641	6660
	Isolated clumps <10% cover	51	J	CT-T19 Between Waypoints:-	642	6661
	Isolated clumps <10% cover	51	J	CT-T19 Between Waypoints:-	646	6671
	Isolated clumps <10% cover	51	J	CT-T19 Between Waypoints:-	646	6670
	Isolated clumps <10% cover	51	J	↻CT-T23 Between Waypoints:-	657	6688
	Isolated clumps <10% cover	51	J	↻CT-T23 Between Waypoints:-	657	6688
	Isolated clumps <10% cover	51	J	↻CT-T28 Between Waypoints:-	665	6697
	Isolated clumps <10% cover	51	J	↻CT-T28 Between Waypoints:-	665	6696
	Isolated clumps <10% cover	51	J	CT-T40 Between Waypoints:-	655	6731
	Isolated clumps <10% cover	51	J	CT-T40 Between Waypoints:-	655	6731
	Isolated clumps <10% cover	51	J	CT-T9 Between Waypoints:-	630	6615
	Isolated clumps <10% cover	51	J	CT-T9 Between Waypoints:-	631	6615
<i>Microcorys macredieana</i> (P3)	<10 plants	51	J	↻CMC-T3	651	6678
	<10% plants	51	J	99	649	6683
	20 plants	51	J	Opp. coll.	649	6683
	Isolated clumps <10% cover	51	J	↻55	655	6685
	<10% cover	51	J	70	647	6715
	N/A	51	J	Opp. coll.	648	6716
	100+ plants	51	J	From->	648	6717
	100+ plants	51	J	to->	647	6716
	<10 plants	51	J	75	653	6722
	1 plant	51	J	CT-T42	655	6736
	2 plants	51	J	Opp. coll.	658	6738
	1 plant	51	J	Opp. coll.	657	6740
	1 plant	51	J	Opp. coll.	657	6741
	1 plant	51	J	Opp. coll.	656	6745
	11 plants	51	J	Opp. coll.	656	6746
<10 plants	51	J	94	654	6756	
<i>Micromyrtus stenocalyx</i> (P3)	Isolated clumps	52	J	↻56	655	6688
	2 plants	53	J	↻59	660	6689



Priority species	Cover (%) / No. of plants	Zone		Site no. / Transect no. / Opp. coll.	Easting (mE)	Northing (mN)
<i>Micromyrtus stenocalyx</i> (P3)	Isolated clumps	54	J	↻JN-T5	656 [REDACTED]	6688 [REDACTED]
<i>Comesperma viscidulum</i> (P4)	1 plant <10 plants	51	J	CT-T18	643 [REDACTED]	6663 [REDACTED]
		51	J	CT-T8	648 [REDACTED]	6673 [REDACTED]
<i>Daviesia purpurascens</i> (P4)	15 plants 10+ plants	51	J	↻Opp. coll.	668 [REDACTED]	6702 [REDACTED]
	10+ plants	51	J	Opp. coll.	643 [REDACTED]	6709 [REDACTED]
	10+ plants	51	J	Opp. coll.	643 [REDACTED]	6706 [REDACTED]
	10-20 plants	51	J	From ->	643 [REDACTED]	6708 [REDACTED]
		51	J	To ->	643 [REDACTED]	6710 [REDACTED]
	20-30 plants	51	J	JN-T2	643 [REDACTED]	6707 [REDACTED]
	15 plants	51	J	↻CT-T30	656 [REDACTED]	6684 [REDACTED]
	N/A	51	J	↻Opp. coll.	654 [REDACTED]	6682 [REDACTED]
<i>Lepidobolus desertii</i> (P4)	N/A	51	J	Opp. coll.	620 [REDACTED]	6592 [REDACTED]
	20-30 plants	51	J	↻Opp. coll.	656 [REDACTED]	6688 [REDACTED]
	Isolated clumps	51	J	↻59	660 [REDACTED]	6689 [REDACTED]
	20-30 plants	51	J	↻Opp. coll.	660 [REDACTED]	6689 [REDACTED]
	100+ plants	51	J	Opp. coll.	648 [REDACTED]	6696 [REDACTED]
	4-6 plants	51	J	70	647 [REDACTED]	6715 [REDACTED]
	40+ plants	51	J	MH-T3	647 [REDACTED]	6715 [REDACTED]
	12 plants	51	J	MH-T3	647 [REDACTED]	6715 [REDACTED]
	2 plants	51	J	MH-T3	647 [REDACTED]	6715 [REDACTED]
	<i>Caesia talingka</i> ms *					
<p>The name <i>Caesia talingka</i> ms is not recognised on FloraBase, but it is currently undergoing taxonomic review. The name on FloraBase is <i>Caesia rigidifolia</i> (Priority 1). <i>C. rigidifolia</i> is also currently under taxonomic review and may become a new species altogether. FloraBase should be updated in the near future to reflect the current taxonomic knowledge for this species.</p>						
<i>Caesia talingka</i> ms (not currently listed)	<10%	51	J	↻Opp coll	655 [REDACTED]	6688 [REDACTED]
	Many	51	J	↻Opp coll	656 [REDACTED]	6688 [REDACTED]
	<10%	51	J	↻55	655 [REDACTED]	6685 [REDACTED]
	N/A	51	J	CT-T19	646 [REDACTED]	6670 [REDACTED]
	<10%	51	J	↻JN-T5	655 [REDACTED]	6688 [REDACTED]



Priority species	Cover (%) / No. of plants	Zone	Site no. / Transect no. / Opp. coll.	Easting (mE)	Northing (mN)
<i>Eremophila ?undulata</i>					
A single collection potentially of this taxon was recorded but could not be unequivocally identified due to insufficient material.					
<i>Eremophila ?undulata</i> (P2)	<10%	51 J	45	645 [REDACTED]	6666 [REDACTED]

⇒ = Denotes locations on original alignment of Tropicana-Transline Infrastructure Corridor beyond and north-east of the junction of the new section of track with the old track.



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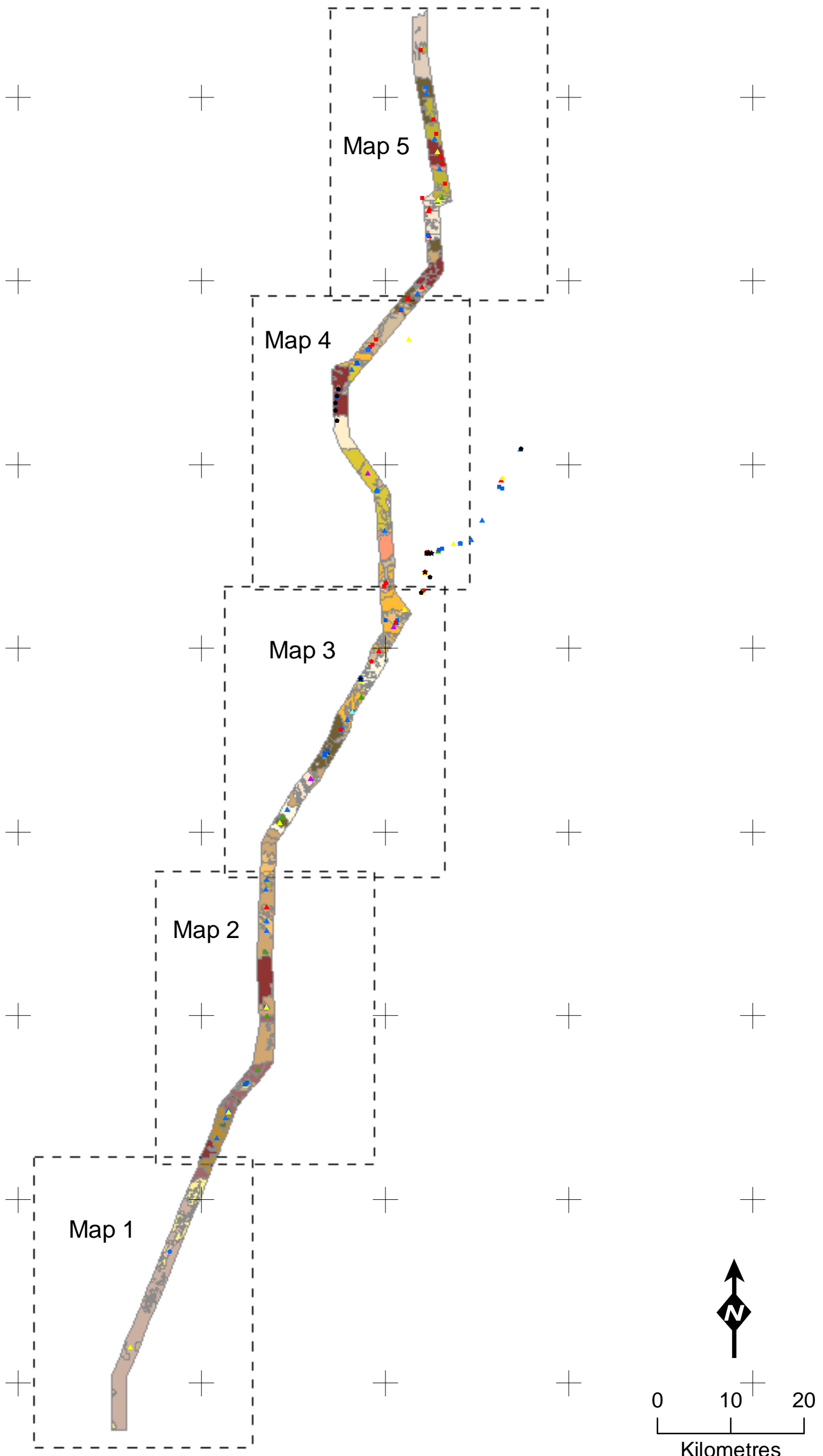
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Legend

- *Dampiera eriantha* (P1)
- ▲ *Baeckea* sp. Great Victoria Desert (P2)
- ▲ *Dichrastylis nicholasii* (P2)
- ▲ *Eremophila ?undulata* (P2)
- ▲ *Grevillea secunda* (P2)
- ▲ *Isotropis canescens* (P2)
- ▲ *Malleostemon* sp. Officer Basin (P2)
- ▲ *Olearia arida* (P2)
- ▲ *Physopsis chrysotricha* (P2)
- *Dicrastylis cundeeleensis* (P3)
- *Microcorys macredieana* (P3)
- *Micromyrtus stenocalyx* (P3)
- *Comesperma viscidulum* (P4)
- *Daviesia purpurascens* (P4)
- *Lepidobolus desertii* (P4)
- ★ *Caesia talinka* (ConSig)

- 1A
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- 9A
- 9B
- 9C

Map 1-5 zoomed in areas



Absolute Scale - 1:590,452



Tropicana - Transline
Infrastructure Corridor
Flora of Conservation Significance
Overview

Figure: E.1	Drawn: SG
Project ID: 829	Date: 07/07/09
<small>Coordinate System Name: GDA 1994 MGA Zone 51 Projection: Transverse Mercator Datum: GDA 1994</small>	
<small>Unique Map ID: M142a</small>	



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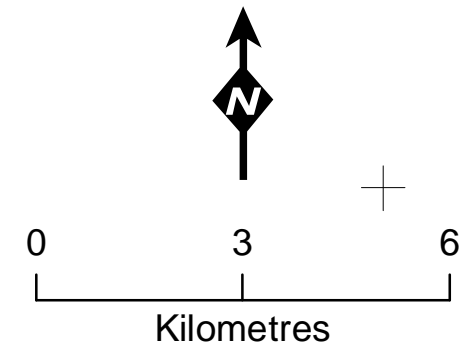
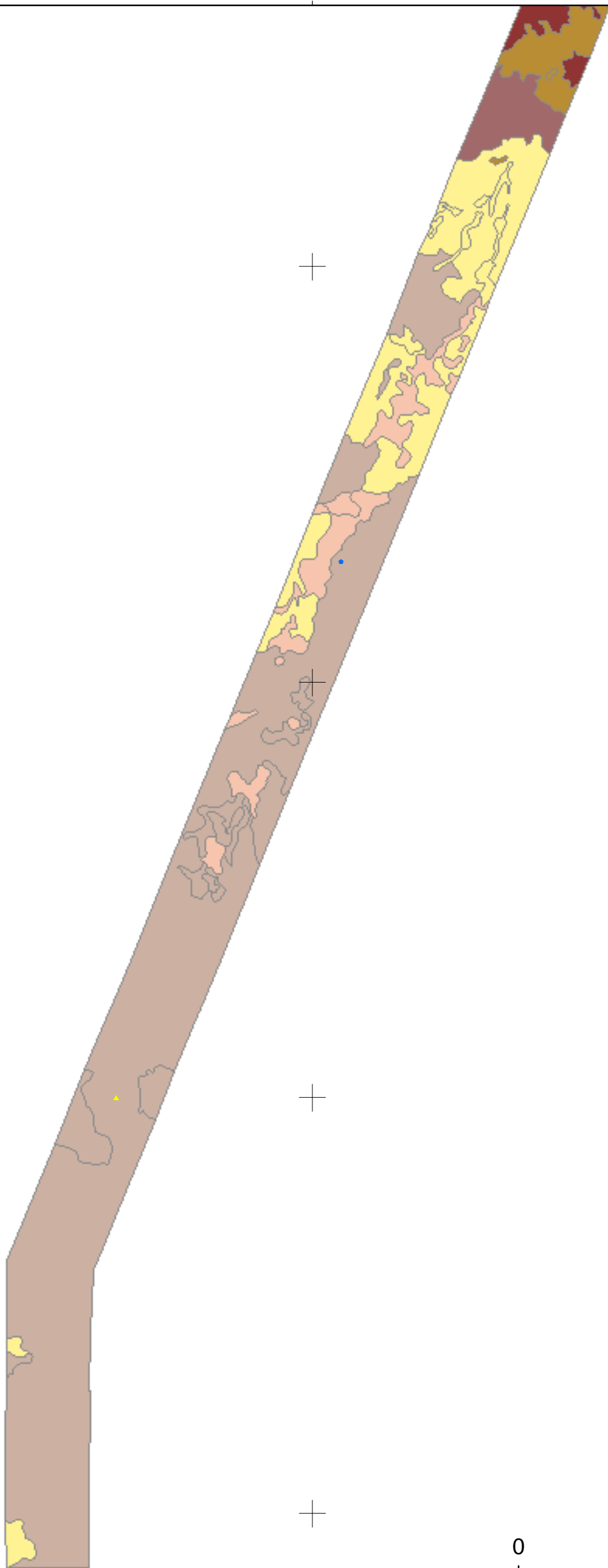
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Legend

- *Dampiera eriantha* (P1)
- ▲ *Baeckea* sp. Great Victoria Desert (P2)
- ▲ *Dichrastylis nicholasii* (P2)
- ▲ *Eremophila ?undulata* (P2)
- ▲ *Grevillea secunda* (P2)
- ▲ *Isotropis canescens* (P2)
- ▲ *Malleostemon* sp. Officer Basin (P2)
- ▲ *Olearia arida* (P2)
- ▲ *Physopsis chrysotricha* (P2)
- *Dicrastylis cundeleeensis* (P3)
- *Microcorys macredieana* (P3)
- *Micromyrtus stenocalyx* (P3)
- *Comesperma viscidulum* (P4)
- *Daviesia purpurascens* (P4)
- *Lepidobolus desertii* (P4)
- ★ *Caesia talinka* (ConSig)

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Absolute Scale - 1:110,000



Tropicana - Transline
Infrastructure Corridor
Flora of Conservation Significance

Figure: E.2
Project ID: 829
Drawn: SG
Date: 07/07/09

Coordinate System Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994
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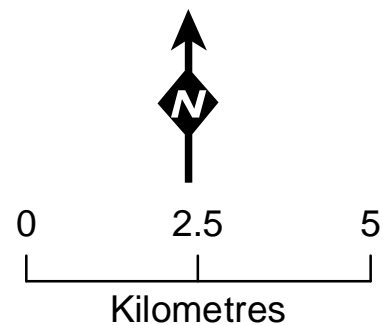
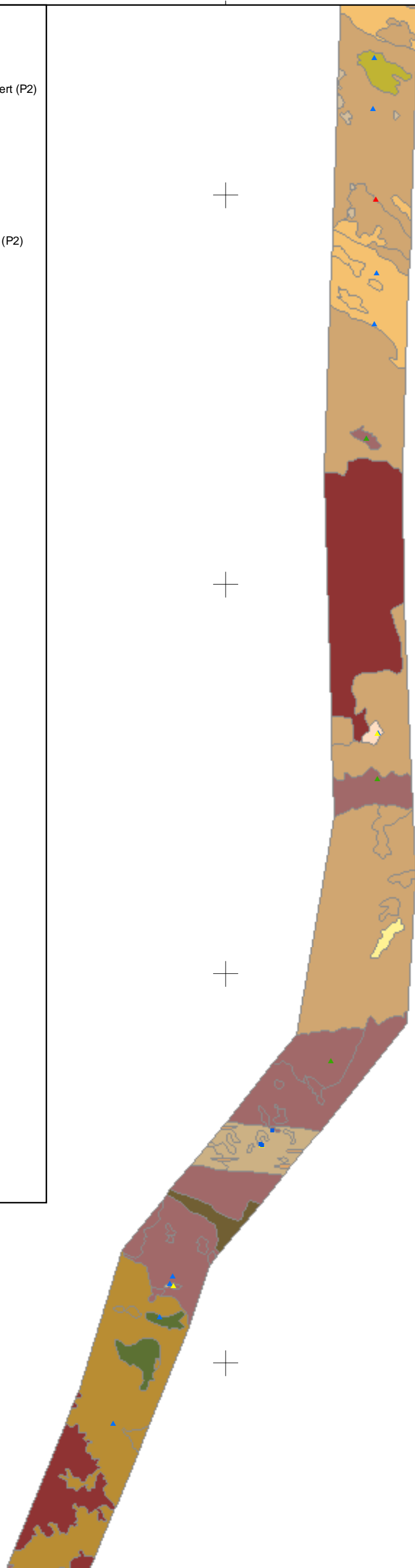
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Legend

- *Dampiera eriantha* (P1)
- ▲ *Baeckea* sp. Great Victoria Desert (P2)
- ▲ *Dichrastylis nicholasii* (P2)
- ▲ *Eremophila ?undulata* (P2)
- ▲ *Grevillea secunda* (P2)
- ▲ *Isotropis canescens* (P2)
- ▲ *Malleostemon* sp. Officer Basin (P2)
- ▲ *Olearia arida* (P2)
- ▲ *Physopsis chrysotricha* (P2)
- *Dicrastylis cundeeleensis* (P3)
- *Microcorys macredieana* (P3)
- *Micromyrtus stenocalyx* (P3)
- *Comesperma viscidulum* (P4)
- *Daviesia purpurascens* (P4)
- *Lepidobolus desertii* (P4)
- ★ *Caesia talinka* (ConSig)

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Absolute Scale - 1:110,000



Tropicana - Transline
Infrastructure Corridor
Flora of Conservation Significance

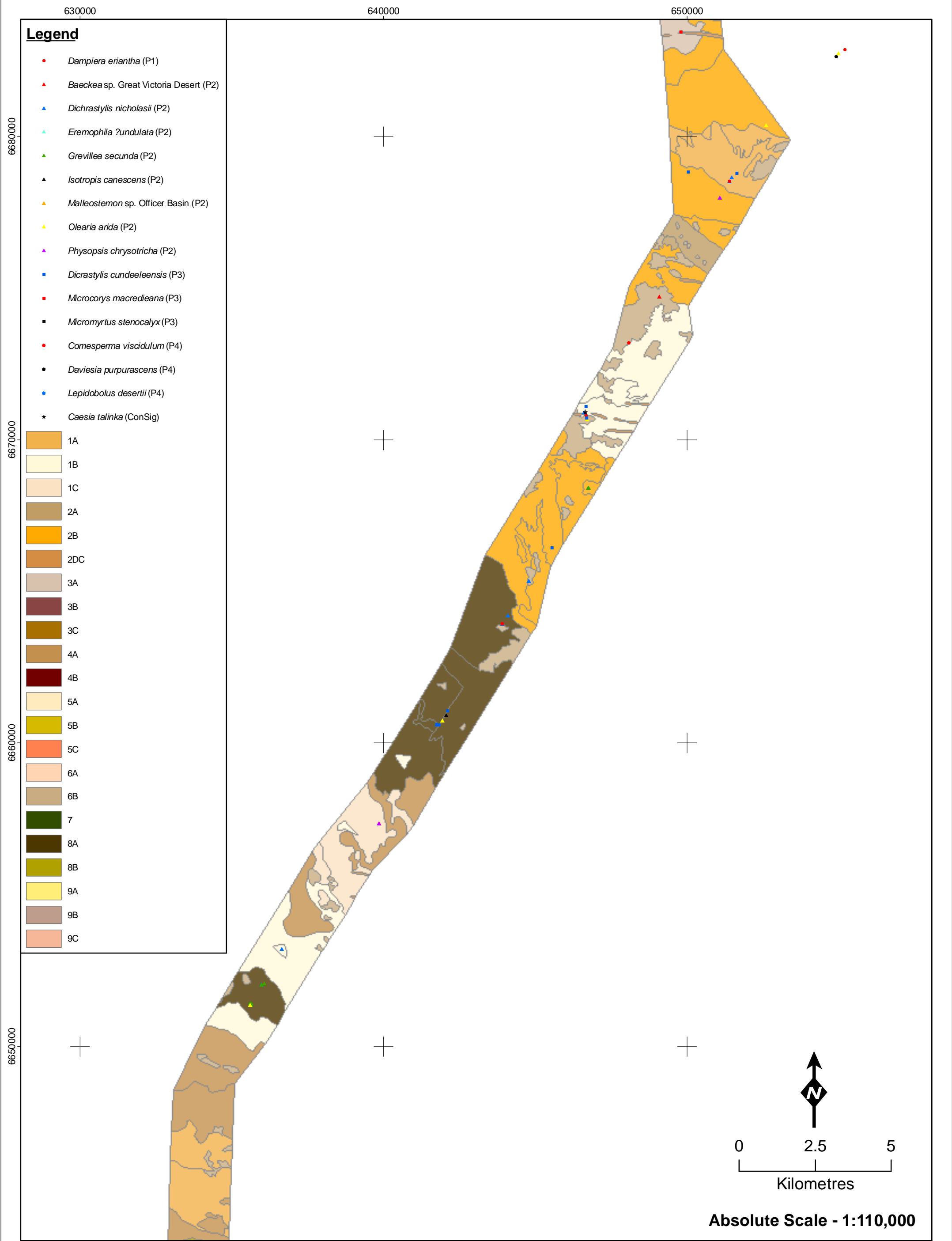
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Drawn: SG
Date: 07/07/09

Coordinate System
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Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: M144a



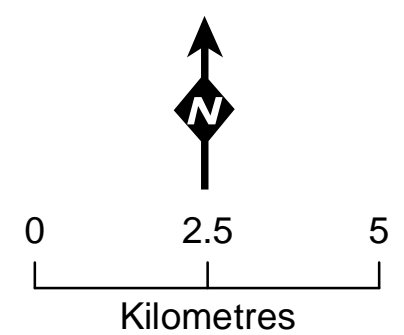
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Legend

- *Dampiera eriantha* (P1)
- ▲ *Baeckea* sp. Great Victoria Desert (P2)
- ▲ *Dichrastylis nicholasii* (P2)
- ▲ *Eremophila ?undulata* (P2)
- ▲ *Grevillea secunda* (P2)
- ▲ *Isotropis canescens* (P2)
- ▲ *Malleostemon* sp. Officer Basin (P2)
- ▲ *Olearia arida* (P2)
- ▲ *Physopsis chrysotricha* (P2)
- *Dicrastylis cundeeleensis* (P3)
- *Microcorys macredieana* (P3)
- *Micromyrtus stenocalyx* (P3)
- *Comesperma viscidulum* (P4)
- *Daviesia purpurascens* (P4)
- *Lepidobolus desertii* (P4)
- ★ *Caesia talinka* (ConSig)

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Absolute Scale - 1:110,000

Figure: E.4	Drawn: SG
Project ID: 829	Date: 07/07/09
<small>Coordinate System Name: GDA 1994 MGA Zone 51 Projection: Transverse Mercator Datum: GDA 1994</small>	
<small>Unique Map ID: M145a</small>	



Tropicana - Transline
Infrastructure Corridor
Flora of Conservation Significance



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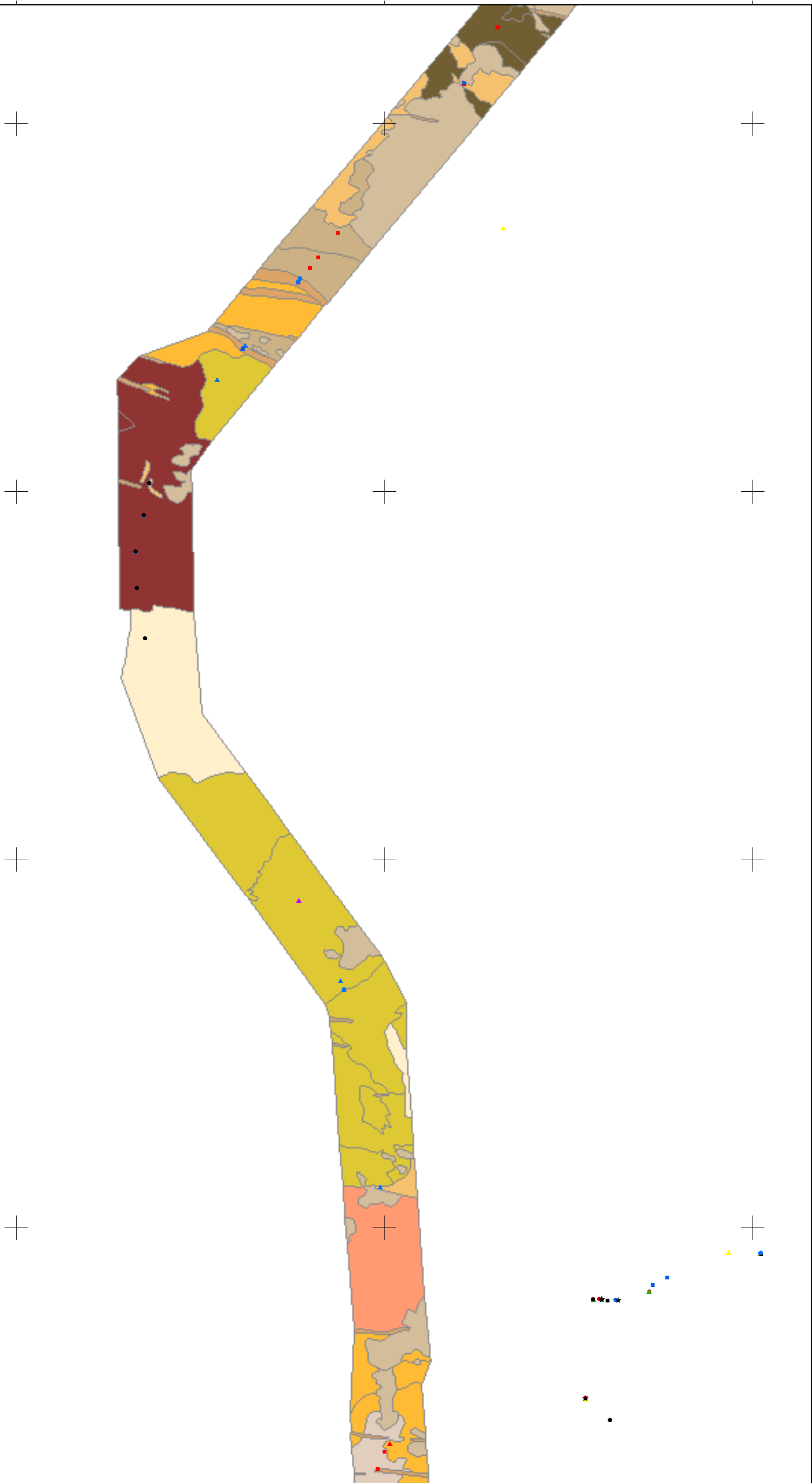
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Legend

- *Dampiera eriantha* (P1)
- ▲ *Baeckea* sp. Great Victoria Desert (P2)
- ▲ *Dichrastylis nicholasii* (P2)
- ▲ *Eremophila ?undulata* (P2)
- ▲ *Grevillea secunda* (P2)
- ▲ *Isotropis canescens* (P2)
- ▲ *Malleostemon* sp. Officer Basin (P2)
- ▲ *Olearia arida* (P2)
- ▲ *Physopsis chrysotricha* (P2)
- *Dicrastylis cundeeleensis* (P3)
- *Microcorys macredieana* (P3)
- *Micromyrtus stenocalyx* (P3)
- *Comesperma viscidulum* (P4)
- *Daviesia purpurascens* (P4)
- *Lepidobolus desertii* (P4)
- ★ *Caesia talinka* (ConSig)

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Absolute Scale - 1:110,000



Tropicana - Transline
Infrastructure Corridor
Flora of Conservation Significance

Figure: E.5
Project ID: 829

Drawn: SG
Date: 07/07/09

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: M146a



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Legend

- *Dampiera eriantha* (P1)
- ▲ *Baeckea* sp. Great Victoria Desert (P2)
- ▲ *Dichrastylis nicholasii* (P2)
- ▲ *Eremophila ?undulata* (P2)
- ▲ *Grevillea secunda* (P2)
- ▲ *Isotropis canescens* (P2)
- ▲ *Malleostemon* sp. Officer Basin (P2)
- ▲ *Olearia arida* (P2)
- ▲ *Physopsis chrysotricha* (P2)
- *Dicrastylis cundeeleensis* (P3)
- *Microcorys macredieana* (P3)
- *Micromyrtus stenocalyx* (P3)
- *Comesperma viscidulum* (P4)
- *Daviesia purpurascens* (P4)
- *Lepidobolus desertii* (P4)
- ★ *Caesia talinka* (ConSig)

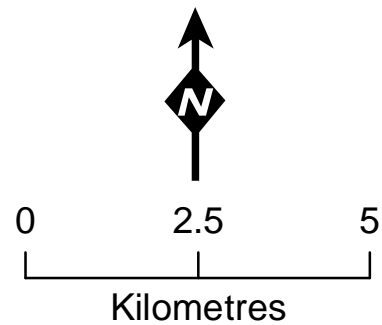
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Absolute Scale - 1:110,000



Tropicana - Transline
Infrastructure Corridor
Flora of Conservation Significance

Figure: E.6
Project ID: 829
Drawn: SG
Date: 07/07/09

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: M147a



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APPENDIX F: Vegetation units – maps and species by unit matrix



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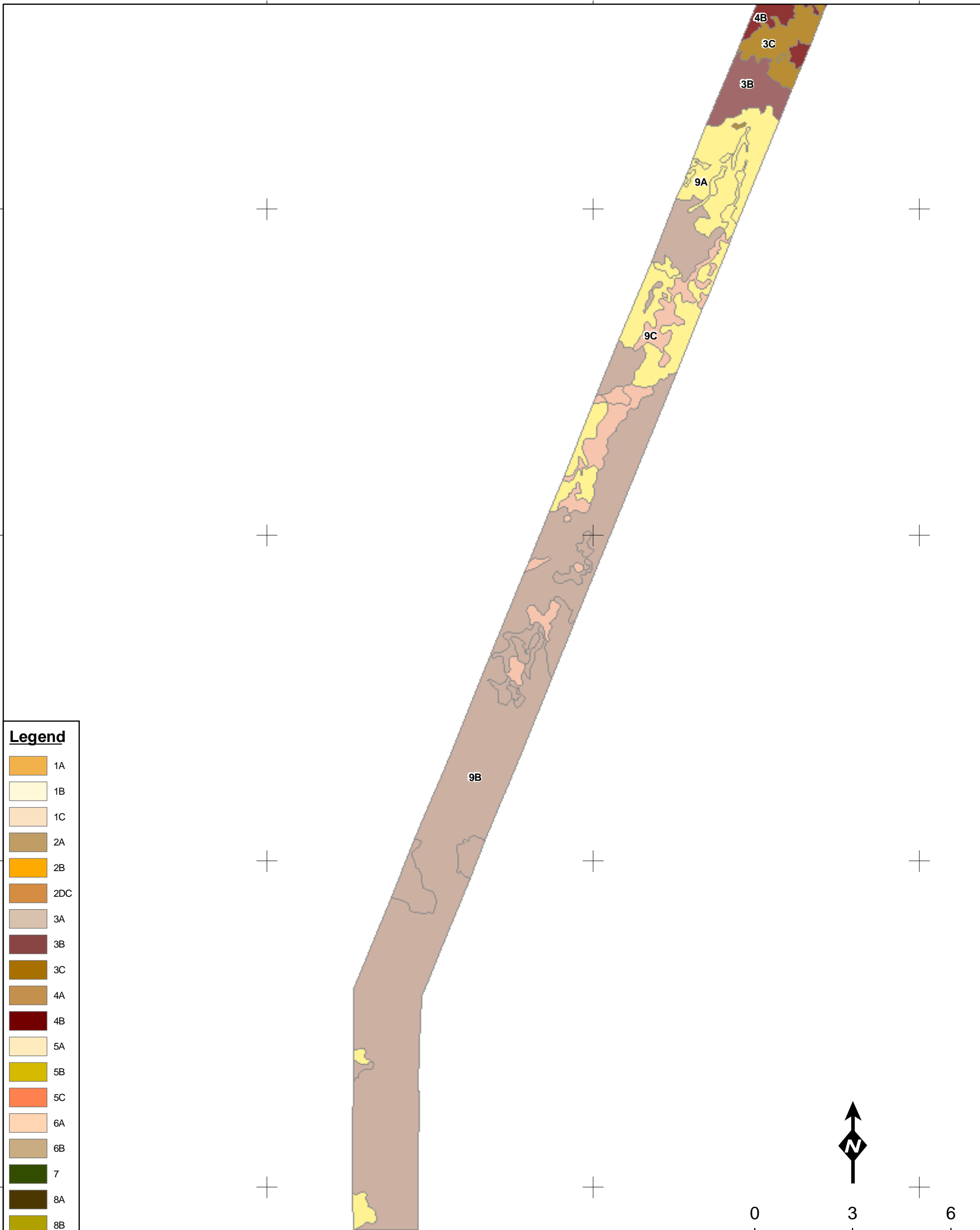
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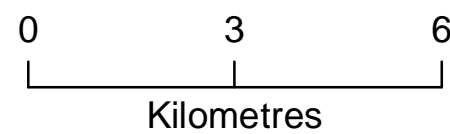
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Legend

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Absolute Scale - 1:110,000



Tropicana - Transline
Infrastructure Corridor
Vegetation Units

Figure: F.1
Project ID: 829

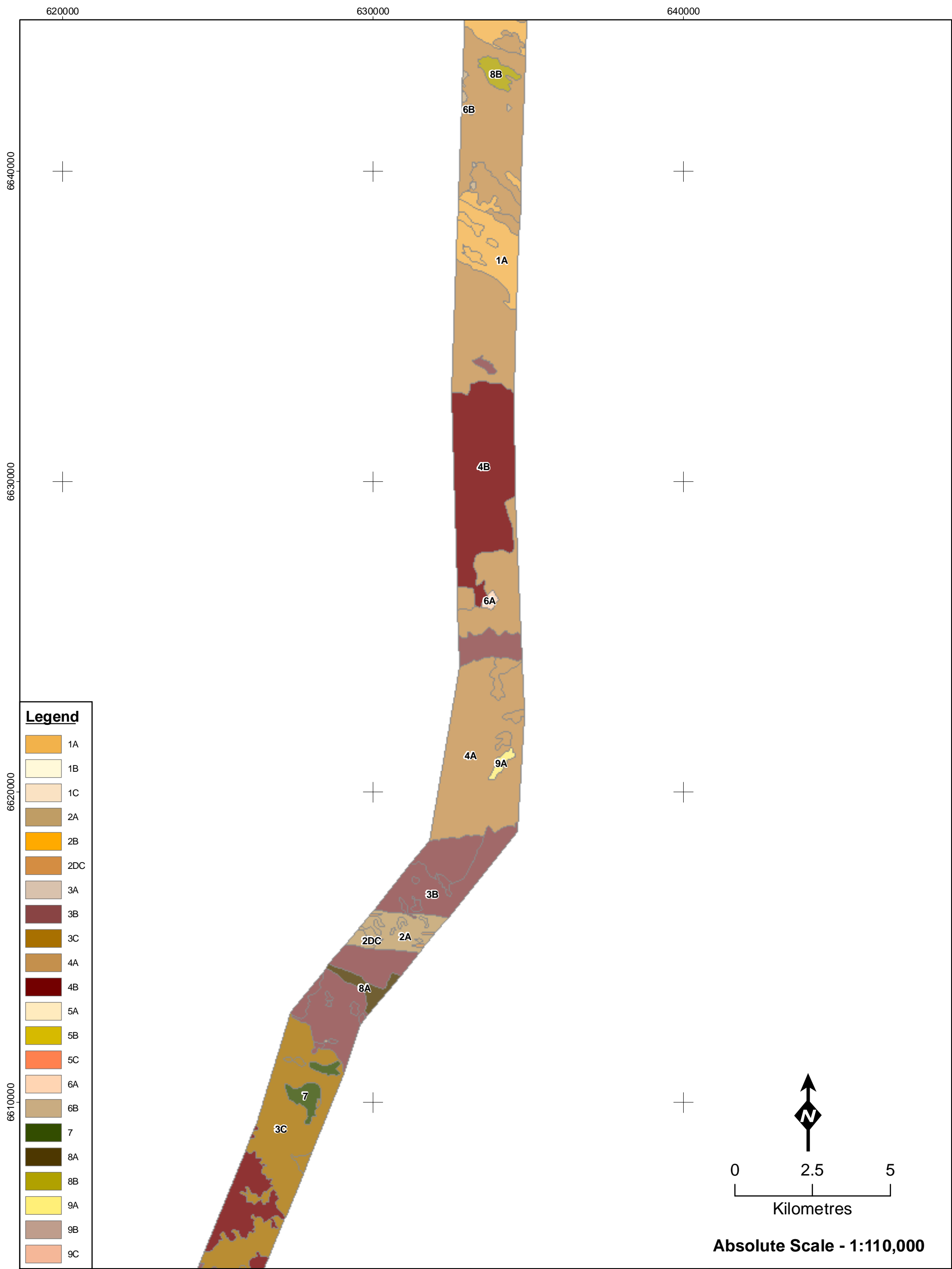
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Unique Map ID: M148a

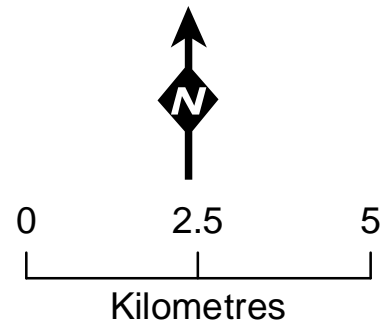


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Legend

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Absolute Scale - 1:110,000

Figure: F.2
Project ID: 829
Drawn: SG
Date: 07/07/09

Coordinate System
 Name: GDA 1994 MGA Zone 51
 Projection: Transverse Mercator
 Datum: GDA 1994

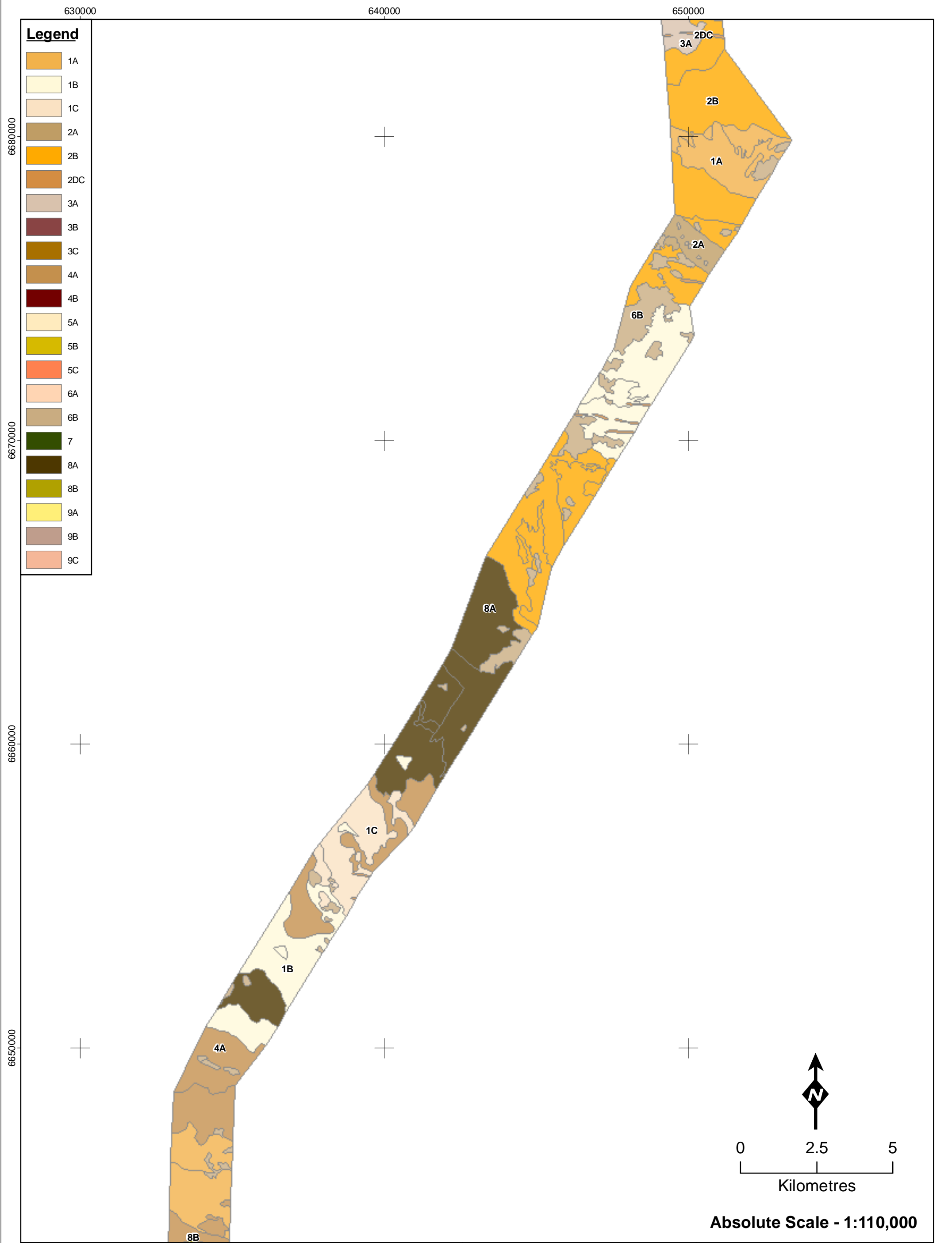
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Tropicana - Transline
 Infrastructure Corridor
 Vegetation Units

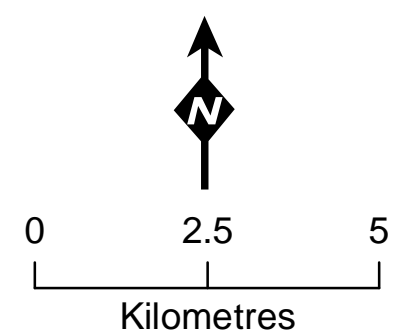


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- 9A
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Absolute Scale - 1:110,000

Figure: F.3	Drawn: SG
Project ID: 829	Date: 07/07/09
<small>Coordinate System Name: GDA 1994 MGA Zone 51 Projection: Transverse Mercator Datum: GDA 1994</small>	
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Tropicana - Transline
Infrastructure Corridor
Vegetation Units



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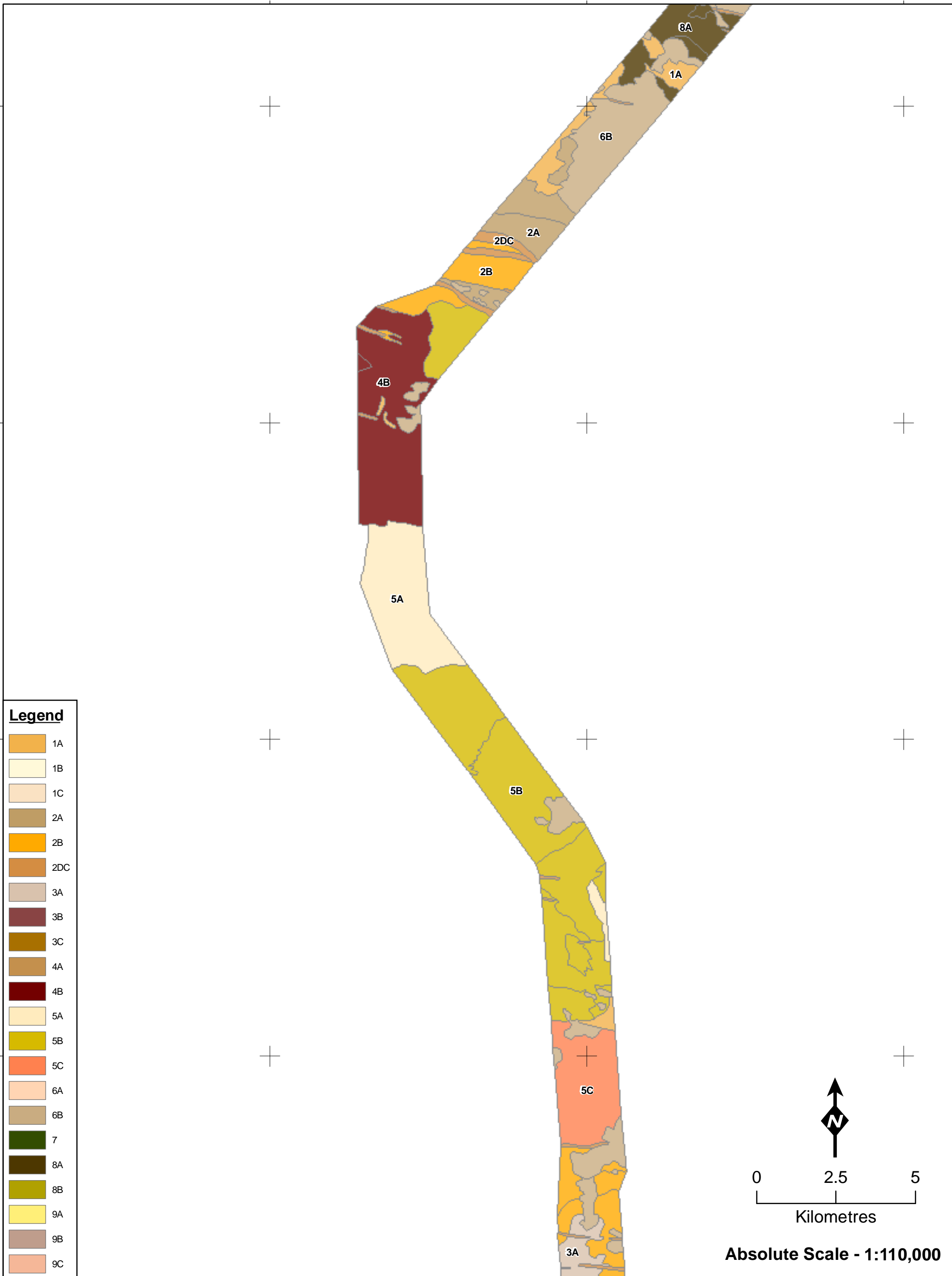
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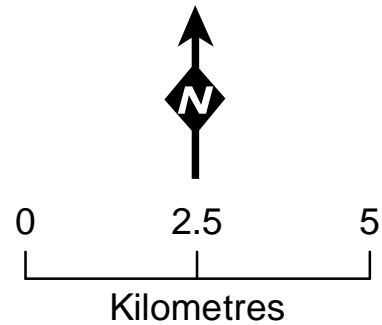
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Legend

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Absolute Scale - 1:110,000



Tropicana - Transline
Infrastructure Corridor
Vegetation Units

Figure: F.4
Project ID: 829

Drawn: SG
Date: 07/07/09

Coordinate System
Name: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

Unique Map ID: M151a



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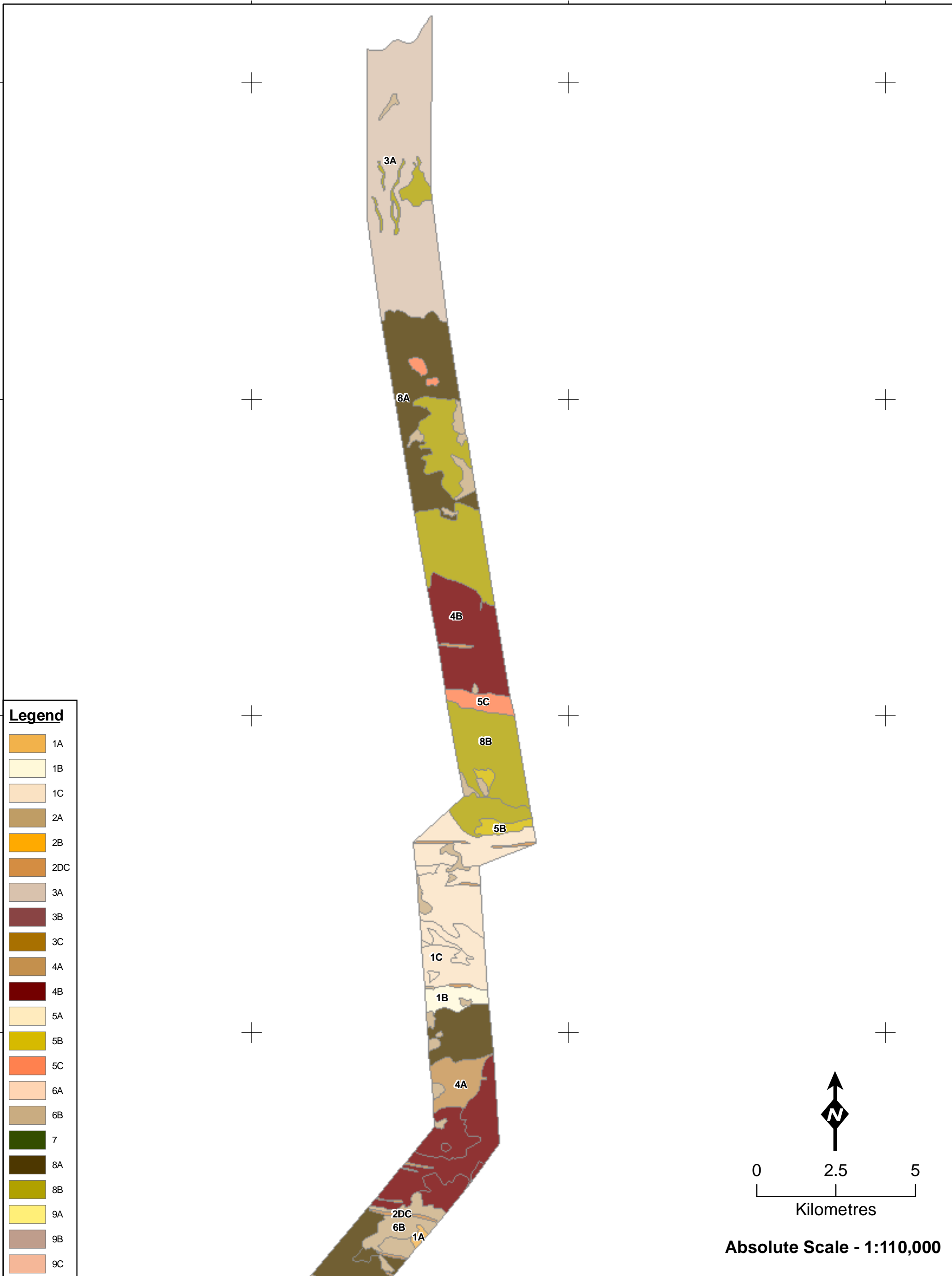
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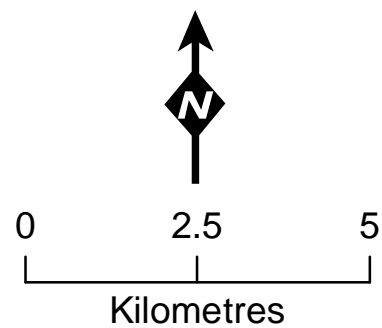
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Legend

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- 7
- 8A
- 8B
- 9A
- 9B
- 9C



Absolute Scale - 1:110,000

Figure: F.5	Drawn: SG
Project ID: 829	Date: 07/07/09
<small>Coordinate System Name: GDA 1994 MGA Zone 51 Projection: Transverse Mercator Datum: GDA 1994</small>	
<small>Unique Map ID: M152a</small>	



Tropicana - Transline
Infrastructure Corridor
Vegetation Units



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Table F.1: Species by community matrix

Species	Community Type																					
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c
<i>Ptilotus obovatus</i> var. <i>obovatus</i>	*						*	*		*	*		*	*	*	*			*	*	*	*
<i>Ptilotus schwartzii</i> var. <i>georgei</i>				*							*		*				*					
<i>Ptilotus sessilifolius</i>										*		*										
<i>Alyxia buxifolia</i>			*	*							*					*		*	*			
<i>Marsdenia australis</i>						*			*		*	*	*							*	*	*
<i>Brachyscome blackii</i>																*						
<i>Chrysocephalum apiculatum</i>	*	*				*		*														
<i>Chrysocephalum puteale</i>							*									*						
<i>Cratystylis conocephala</i>										*										*	*	*
<i>Cratystylis subspinescens</i>																				*	*	*
<i>Olearia arida</i> (P2)								*			*											
<i>Olearia exiguifolia</i>											*								*			
<i>Olearia incana</i>		*		*				*														
<i>Olearia muelleri</i>								*		*										*	*	*
<i>Olearia subspicata</i>		*									*											



Species	Community Type																					
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c
<i>Streptoglossa liatroides</i>																					*	
<i>Halgania cyanea</i>						*				*			*			*	*					
<i>Halgania integerrima</i>	*							*					*									
<i>Petalostylis cassioides</i>	*																*					
<i>Senna artemisioides</i>	*		*			*	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*
<i>Senna pleurocarpa</i> var. <i>pleurocarpa</i>	*	*						*		*	*	*	*			*	*	*	*			
<i>Allocasuarina acutivalvis</i>		*																*			*	
<i>Allocasuarina helmsii</i>	*		*			*				*			*					*				
<i>Allocasuarina spinosissima</i>					*																	
<i>Casuarina pauper</i>																				*	*	*
<i>Atriplex bunburyana</i>																					*	*
<i>Atriplex nummularia</i> subsp. <i>spathulata</i>																				*	*	*
<i>Atriplex vesicaria</i> subsp. <i>appendiculata</i>																					*	
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>							*												*	*	*	*
<i>Maireana georgei</i>																				*	*	*
<i>Maireana pyramidata</i>							*														*	*



Species	Community Type																						
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c	
<i>Maireana radiata</i>																				*	*		
<i>Maireana sedifolia</i>							*															*	*
<i>Maireana trichoptera</i>							*															*	*
<i>Maireana triptera</i>							*															*	*
<i>Maireana turbinata</i>									*													*	
<i>Maireana villosa</i>											*									*			
<i>Rhagodia drummondii</i>																						*	*
<i>Rhagodia eremaea</i>																						*	
<i>Rhagodia sp.</i>									*				*							*	*		
<i>Rhagodia spinescens</i>																						*	*
<i>Sclerolaena convexula</i>											*	*											
<i>Sclerolaena diacantha</i>										*									*	*	*		
<i>Sclerolaena obliquicuspis</i>																						*	
<i>Sclerolaena patenticuspis</i>																						*	
<i>Bonamia erecta</i>																	*	*					
<i>Callitris columellaris</i>		*														*							



Species	Community Type																					
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c
<i>Callitris preissii</i>	*	*	*	*	*	*				*	*		*	*			*	*	*			
<i>Chrysitrix distigmata</i>					*																	
<i>Schoenus subaphyllus</i>				*													*					
<i>Hibbertia exasperata</i>																		*				
<i>Bertya dimerostigma</i>	*	*	*	*		*				*			*			*		*	*			
<i>Calycopeplus paucifolius</i>		*		*	*											*		*				
<i>Dampiera lavandulacea</i>																					*	
<i>Dampiera stenophylla</i>				*																		
<i>Dampiera tomentosa</i>											*		*									
<i>Goodenia elderi</i>																						
<i>Goodenia ramelii</i>																						
<i>Goodenia xanthosperma</i>																	*		*			
<i>Scaevola basedowii</i>				*		*												*				
<i>Scaevola parvifolia</i>	*	*		*		*				*			*				*	*				
<i>Scaevola spinescens</i>			*	*			*	*		*	*		*	*		*	*		*	*	*	*
<i>Codonocarpus cotinifolius</i>	*	*		*		*				*	*		*	*		*		*				



Species	Community Type																						
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c	
<i>Gyrostemon ramulosus</i>	*											*	*										
<i>Glischrocaryon aureum</i>																		*					
<i>Dianella revoluta</i> var. <i>divaricata</i>								*									*	*					
<i>Dicrastylis brunnea</i>	*	*								*								*	*				
<i>Dicrastylis nicholasii</i> (P2)	*	*				*		*		*	*		*	*		*	*	*	*				
<i>Dicrastylis parvifolia</i>																		*					
<i>Dicrastylis cundeeleensis</i> (P3)	*			*		*												*					
<i>Dicrastylis</i> sp.		*										*											
<i>Microcorys macrediana</i> (P3)				*	*													*	*				
<i>Newcastelia bracteosa</i>	*																						
<i>Newcastelia hexarrhena</i>																			*				
<i>Physopsis chrysophylla</i> (P3)													*										
<i>Pityrodia lepidota</i>			*			*												*					
<i>Pityrodia loricata</i>	*			*	*	*																	
<i>Prostanthera sericea</i>	*	*	*			*	*				*				*	*	*	*					
<i>Westringia cephalantha</i>	*		*	*				*		*	*		*					*	*				



Species	Community Type																					
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c
<i>Westringia rigida</i>	*		*					*			*		*					*	*	*		
<i>Logania nuda</i>	*			*	*																	
<i>Amyema miquelii</i>														*								
<i>Amyema preissii</i>																				*		
<i>Abutilon leucopetalum</i>		*																				
<i>Alyogyne pinoniana</i>	*	*				*			*	*	*	*	*	*				*	*			
<i>Radyera farragei</i>																				*		
<i>Sida arenicola</i>																		*				
<i>Sida fibulifera</i>																*					*	*
<i>Sida phaeotricha</i>		*																				
<i>Sida spodochroma</i>										*	*									*	*	*
<i>Acacia acanthoclada</i>	*					*												*				
<i>Acacia andrewsii</i>													*									
<i>Acacia aneura</i>	*	*	*		*	*	*				*		*	*	*	*			*	*	*	
<i>Acacia burkittii</i>	*	*	*		*	*	*				*			*	*	*		*	*			
<i>Acacia campoclada</i>				*						*												



Species	Community Type																					
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c
<i>Acacia colletioides</i>				*			*	*	*	*	*		*	*				*		*	*	*
<i>Acacia desertorum</i> var. <i>desertorum</i>	*	*	*	*		*												*				
<i>Acacia eremophila</i> var. <i>eremophila</i>	*																					
<i>Acacia fragilis</i>																		*				
<i>Acacia gilesiana</i>	*		*			*																
<i>Acacia helmsiana</i>	*	*	*	*		*				*	*		*					*	*			
<i>Acacia hemiteles</i>	*		*			*	*	*	*	*	*		*	*			*	*	*	*	*	*
<i>Acacia heteroneura</i> var. <i>jutsonii</i>	*			*	*													*				
<i>Acacia inaequilatera</i>					*																	
<i>Acacia inaequiloba</i>	*					*												*	*			
<i>Acacia jennerae</i>											*							*				
<i>Acacia kempeana</i>	*	*			*	*	*			*						*			*			
<i>Acacia ligulata</i>	*	*	*	*	*	*		*		*	*		*	*		*	*	*	*			
<i>Acacia murrayana</i>		*										*						*				
<i>Acacia nyssophylla</i>																					*	
<i>Acacia oswaldii</i>				*			*						*								*	*



Species	Community Type																						
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c	
<i>Acacia prainii</i>																			*				
<i>Acacia ramulosa</i> var. <i>ramulosa</i>																						*	
<i>Acacia rhodophloia</i>																*		*					
<i>Acacia rigens</i>	*							*		*			*					*					
<i>Acacia sibina</i>	*	*	*			*					*												
<i>Acacia tetragonophylla</i>			*				*	*			*		*	*	*	*			*	*	*	*	*
<i>Acacia xerophila</i> var. <i>xerophila</i>										*													
<i>Eremophila alternifolia</i>							*												*				
<i>Eremophila decipiens</i> subsp. <i>decipiens</i>	*		*	*		*				*	*		*	*	*	*	*	*					
<i>Eremophila deserti</i>																							*
<i>Eremophila ? falcata</i>								*															
<i>Eremophila forrestii</i>	*		*			*											*						
<i>Eremophila georgei</i>											*			*		*							
<i>Eremophila gilesii</i> subsp. <i>variabilis</i>																		*					
<i>Eremophila glabra</i>	*		*				*	*	*	*			*	*		*			*		*	*	*
<i>Eremophila ionantha</i>																							*



Species	Community Type																					
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c
<i>Eremophila latrobei</i>		*	*				*				*			*	*	*			*		*	
<i>Eremophila longifolia</i>			*												*						*	
<i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>														*								
<i>Eremophila paisleyi</i> subsp. <i>paisleyi</i>																					*	
<i>Eremophila platythamnos</i> subsp. <i>platythamnos</i>		*											*									
<i>Eremophila punctata</i>	*	*	*					*		*								*	*			
<i>Eremophila saligna</i>		*						*								*					*	
<i>Eremophila scoparia</i>							*		*											*	*	*
<i>Eremophila serrulata</i>												*									*	
<i>Eremophila ? undulata</i> (?P2)						*																
<i>Myoporum platycarpum</i> subsp. <i>platycarpum</i>			*					*	*	*	*			*					*	*	*	*
<i>Aluta maisonneuvei</i> subsp. <i>auriculata</i>	*	*	*	*		*										*		*	*			
<i>Baeckea</i> sp. Gt. Victoria Desert (A.S. Weston 14813) (P2)	*	*			*	*												*	*			
<i>Calothamnus gilesii</i>	*			*															*			
<i>Enekbatus eremaeus</i>		*	*		*												*	*				



Species	Community Type																						
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c	
<i>Eucalyptus ceratocorys</i>	*			*						*													
<i>Eucalyptus concinna</i>	*	*	*					*			*	*	*						*	*			
<i>Eucalyptus cylindrocarpa</i>											*												
<i>Eucalyptus ebbanoensis</i> subsp. <i>glauciramula</i>																			*				
<i>Eucalyptus eremicola</i> subsp. <i>peeneri</i>												*											
<i>Eucalyptus gamophylla</i>	*																						
<i>Eucalyptus gongylocarpa</i>			*	*		*				*	*		*					*	*				
<i>Eucalyptus gracilis</i>	*																						
<i>Eucalyptus gypsophila</i>									*					*				*					
<i>Eucalyptus horistes</i>	*	*							*														
<i>Eucalyptus intertexta</i>													*										
<i>Eucalyptus leptophylla</i>			*																				
<i>Eucalyptus leptopoda</i> subsp. <i>elevata</i>																*							
<i>Eucalyptus mannensis</i> subsp. <i>mannensis</i>			*	*														*					
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>						*					*			*			*			*	*		
<i>Eucalyptus optima</i>													*										



Species	Community Type																					
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c
<i>Eucalyptus orbifolia</i>																*	*					
<i>Eucalyptus platycorys</i>										*												
<i>Eucalyptus rigidula</i>	*					*	*															
<i>Eucalyptus rosacea</i>			*			*											*					
<i>Eucalyptus salicola</i>									*													
<i>Eucalyptus salmonophloia</i>																					*	*
<i>Eucalyptus sheathiana</i>											*											
<i>Eucalyptus socialis</i> subsp. <i>socialis</i>										*			*	*								
<i>Eucalyptus trivalva</i>																*		*	*			
<i>Eucalyptus websteriana</i> subsp. <i>websteriana</i>																*			*			
<i>Eucalyptus youngiana</i>																*	*	*				
<i>Homalocalyx thryptomenoides</i>		*		*		*												*	*			
<i>Leptospermum fastigiatum</i>				*	*	*												*				
<i>Melaleuca eleuterostachya</i>								*														
<i>Melaleuca zeteticorum</i>				*				*		*									*			
<i>Thryptomene biseriata</i>	*	*	*	*	*	*										*	*	*				



Species	Community Type																					
	1a	1b	1c	2a	2DC	* 2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	* 8a	* 8b	9a	9b	9c
<i>Verticordia helmsii</i>						*												*	*			
<i>Cullen patens</i>										*										*		
<i>Daviesia benthamii</i> subsp. <i>acanthoclona</i>								*	*	*	*											
<i>Daviesia grahamii</i>												*	*				*					
<i>Daviesia</i> sp. Kanandah (R. Davis 10604)	*																					
<i>Gompholobium gompholobioides</i>																						
<i>Indigofera georgei</i>																			*			
<i>Leptosema aculeatum</i>	*		*		*	*												*	*			
<i>Leptosema chambersii</i>																		*				
<i>Leptosema daviesioides</i>								*		*							*					
<i>Mirbelia depressa</i>			*	*		*																
<i>Mirbelia rhagodioides</i>		*																				
<i>Mirbelia seorsifolia</i>	*	*			*	*												*	*			
<i>Otton simplicifolium</i>		*				*																
<i>Templetonia aculeata</i>													*									
<i>Marianthus bicolor</i>	*																					



Species	Community Type																						
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c	
<i>Austrostipa nitida</i>																	*						
<i>Austrostipa platychaeta</i>																					*	*	
<i>Austrostipa semibarbata</i>															*					*			
<i>Enneapogon cylindricus</i>																					*		
<i>Eragrostis eriopoda</i>	*										*										*		
<i>Eragrostis setifolia</i>	*												*										
<i>Eragrostis xerophila</i>		*												*		*		*	*				
<i>Eriachne helmsii</i>											*								*				
<i>Paspalidium constrictum</i>																			*	*	*	*	*
<i>Triodia basedowii</i>		*		*	*			*	*							*	*	*	*	*			
<i>Triodia desertorum</i>	*				*				*	*	*					*							
<i>Triodia irritans</i>						*						*											
<i>Triodia rigidissima</i>		*				*							*	*		*			*	*	*		
<i>Triodia scariosa</i>				*		*	*	*		*			*			*		*		*			
<i>Triodia schinzii</i>						*											*						
<i>Triodia tomentosa</i>			*	*		*				*													



Species	Community Type																					
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c
<i>Grevillea acacioides</i>																	*	*	*			
<i>Grevillea acuaria</i>																						
<i>Grevillea huegelii</i>																				*		
<i>Grevillea juncifolia</i> subsp. <i>temulenta</i>																		*				
<i>Grevillea nematophylla</i> subsp. <i>planicosta</i>	*	*				*					*		*	*			*	*	*			
<i>Grevillea sarissa</i>								*														
<i>Grevillea secunda</i> (P2)								*									*	*	*			
<i>Grevillea stenobotrya</i>				*	*	*							*									
<i>Hakea francisiana</i>	*		*	*	*	*		*		*	*		*				*	*	*			
<i>Hakea rhombales</i>																					*	*
<i>Persoonia coriacea</i>	*				*					*								*				
<i>Lepidobolus deserti</i> (P4)					*																	
<i>Cryptandra aridicola</i>	*												*									
<i>Cryptandra distigma</i>		*		*	*			*								*		*				
<i>Psydrax ? ammophila</i>																*						
<i>Psydrax suaveolens</i>	*															*			*			



Species	Community Type																					
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c
<i>Geijera linearifolia</i>																					*	
<i>Exocarpos aphyllus</i>																			*	*	*	*
<i>Exocarpos sparteus</i>																						
<i>Santalum acuminatum</i>			*			*												*	*	*	*	
<i>Santalum lanceolatum</i>																						*
<i>Santalum spicatum</i>																					*	*
<i>Alectryon oleifolius</i> subsp. <i>canescens</i>							*	*		*	*									*	*	*
<i>Dodonaea adenophora</i>						*												*	*			
<i>Dodonaea lobulata</i>			*										*	*		*			*		*	
<i>Dodonaea stenozyga</i>	*					*							*					*	*			
<i>Anthotroche pannosa</i>				*	*	*							*					*				
<i>Duboisia hopwoodii</i>	*				*						*		*			*						
<i>Lycium australe</i>																					*	*
<i>Solanum chippendalei</i>																					*	
<i>Solanum ellipticum</i>										*											*	
<i>Solanum lasiophyllum</i>							*				*								*	*	*	*



Species	Community Type																					
	1a	1b	1c	2a	2DC	2b	3a	3b	3c	4a	4b	5a	5b	5c	6a	6b	7	8a	8b	9a	9b	9c
<i>Solanum nummularium</i>							*					*		*	*			*		*	*	*
<i>Solanum orbiculatum</i> subsp. <i>orbiculatum</i>																			*			
<i>Solanum plicatile</i>	*								*		*	*		*	*	*	*	* *	*	*		*
<i>Stackhousia megaloptera</i>	*	*		*		*																
<i>Commersonia melanopetala</i>	*	*			*	*											*	*	*			
<i>Hannafordia bissillii</i> subsp. <i>bissillii</i>	*	*		*		*		*			*		*	*			*	*	*			
<i>Hannafordia quadrivalvis</i> subsp. <i>quadrivalvis</i>		*																				
<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>	*	*	*	*		*				*			*			*	*	*	*			
<i>Rulingia craurophylla</i>												*	*					*	*			
<i>Stylidium induratum</i>	*					*												*	*			
<i>Stylidium limbatum</i>					*																	
<i>Pimelea microcephala</i> subsp. <i>microcephala</i>																					*	
<i>Zygophyllum apiculatum</i>											*	*								*		
<i>Zygophyllum aurantiacum</i>									*											*	*	*

Note: Only those species recorded within quadrats and used within the SYSTAT data analysis have been included in this matrix



APPENDIX G: Vegetation units - photographs



Plate 1: Mixed *Eucalyptus* spp. woodland over hummock grassland



Plate 2: *Callitris preissii* tall shrubland



Plate 3: Mixed *Eucalyptus* spp. woodland over *Triodia scariosa* hummock grassland



Plate 4: Mixed *Eucalyptus* spp. woodland with *Acacia* understorey over *Triodia desertorum* hummock grassland



Plate 5: *Triodia rigidissima* hummock grassland



Plate 6: *Acacia aneura* woodland



Plate 7: Low mixed shrubland



Plate 8: *Triodia basedownii* hummock grassland



Plate 9: *Eucalyptus/Casuarina* mallee shrubland over chenopods



APPENDIX H: Codes used to describe vegetation mapped along the Corridor (and the TGP area)



Code for Physiognomy of dominant stratum (or strata) (in capitals), which is placed after the floristic code in each stratum	
Medium trees 10-25 m	M
Low trees	L
Shrubs > 1 m tall	S
Shrubs < 1 m tall	Z
Bunch ("soft") grassed	G
Hummock grasses	H
Succulents	C
Forbs (herbs)	F

Note: Beard floristic codes have been used when available, new codes have been given to species when there is no existing Beard code.

Species	Code
<i>Acacia aneura</i>	<i>a</i>
<i>Acacia hemiteles</i>	<i>a</i> ₃₃
<i>Acacia ligulata</i>	<i>a</i> ₂₁
<i>Acacia murrayana</i>	<i>a</i> ₂₀
<i>Acacia nyssyophylla</i>	<i>a</i> ₃₃
<i>Acacia quadrimarginea</i>	<i>a</i> ₁₄
<i>Acacia ramulosa</i>	<i>a</i> ₉
Mixed <i>Acacia</i> species	<i>a</i> _x
<i>Aluta maisonneuvei</i> subsp. <i>auriculata</i>	<i>al</i> ₁
<i>Alectryon oleifolius</i> subsp. <i>canescens</i>	<i>al</i> ₂
<i>Atriplex vesicaria</i>	<i>k</i> ₁
<i>Callitris columellaris</i>	<i>p</i> ₁
<i>Callitris preissii</i>	<i>p</i> ₂
<i>Casuarina pauper</i>	<i>c</i> ₂
<i>Chenopodium nitrariaceum</i>	<i>k</i> ₄
<i>Dodonaea viscosa</i> subsp. <i>angustissima</i>	<i>d</i> ₃
<i>Eremophila longifolia</i>	<i>er</i> ₂
<i>Eremophila platythamnos</i>	<i>er</i> ₁
Mixed <i>Eremophila</i> species	<i>er</i> _x
<i>Eucalyptus concinna</i>	<i>e</i> ₇₁
<i>Eucalyptus eremicola</i> subsp. <i>peeneri</i>	<i>e</i> ₇₅
<i>Eucalyptus gamophylla</i>	<i>e</i> ₂₅
<i>Eucalyptus gongylocarpa</i>	<i>e</i> ₁₉
<i>Eucalyptus mannensis</i>	<i>e</i> ₇₂
<i>Eucalyptus oleosa</i>	<i>e</i> ₂₂
<i>Eucalyptus salicola</i>	<i>e</i> ₇₃
<i>Eucalyptus salmonophloia</i>	<i>e</i> ₈
<i>Eucalyptus sheathiana</i>	<i>e</i> ₇₄



Species	Code
<i>Eucalyptus socialis</i>	e ₃₀
<i>Eucalyptus trivalva</i>	e ₇₀
<i>Eucalyptus youngiana</i>	e ₂₀
Mixed <i>Eucalyptus</i> species	e _x
<i>Frankenia cinerea</i>	k ₃
<i>Grevillea sarissa</i>	g ₃
<i>Grevillea juncifolia</i>	g ₁
<i>Lomandra leucocephala</i>	l ₁
<i>Maireana</i> spp.	k ₂
Mixed <i>Chenopodiaceae</i>	k _x
<i>Melaleuca interioris</i>	m ₇
<i>Muehlenbeckia florulenta</i>	mu ₁
<i>Ptilotus obovatus</i>	pt ₁
<i>Thryptomene biseriata</i>	th ₁
<i>Triodia pungens</i>	t ₁
<i>Triodia basedowii</i>	t ₂
<i>Triodia wiseana</i>	t ₃
<i>Triodia intermedia</i>	t ₄
<i>Triodia brizoides</i>	t ₆
<i>Triodia desertorum</i>	t ₇
<i>Triodia scariosa</i>	t ₈
<i>Triodia tomentosa.</i>	t ₉
<i>Triodia tomentosa.</i>	t ₁₂
<i>Triodia rigidissima.</i>	t ₁₃
<i>Triodia irritans.</i>	t ₁₄
<i>Triodia schinzii</i>	t ₁₅
Mixed <i>Triodia</i> species	t _x



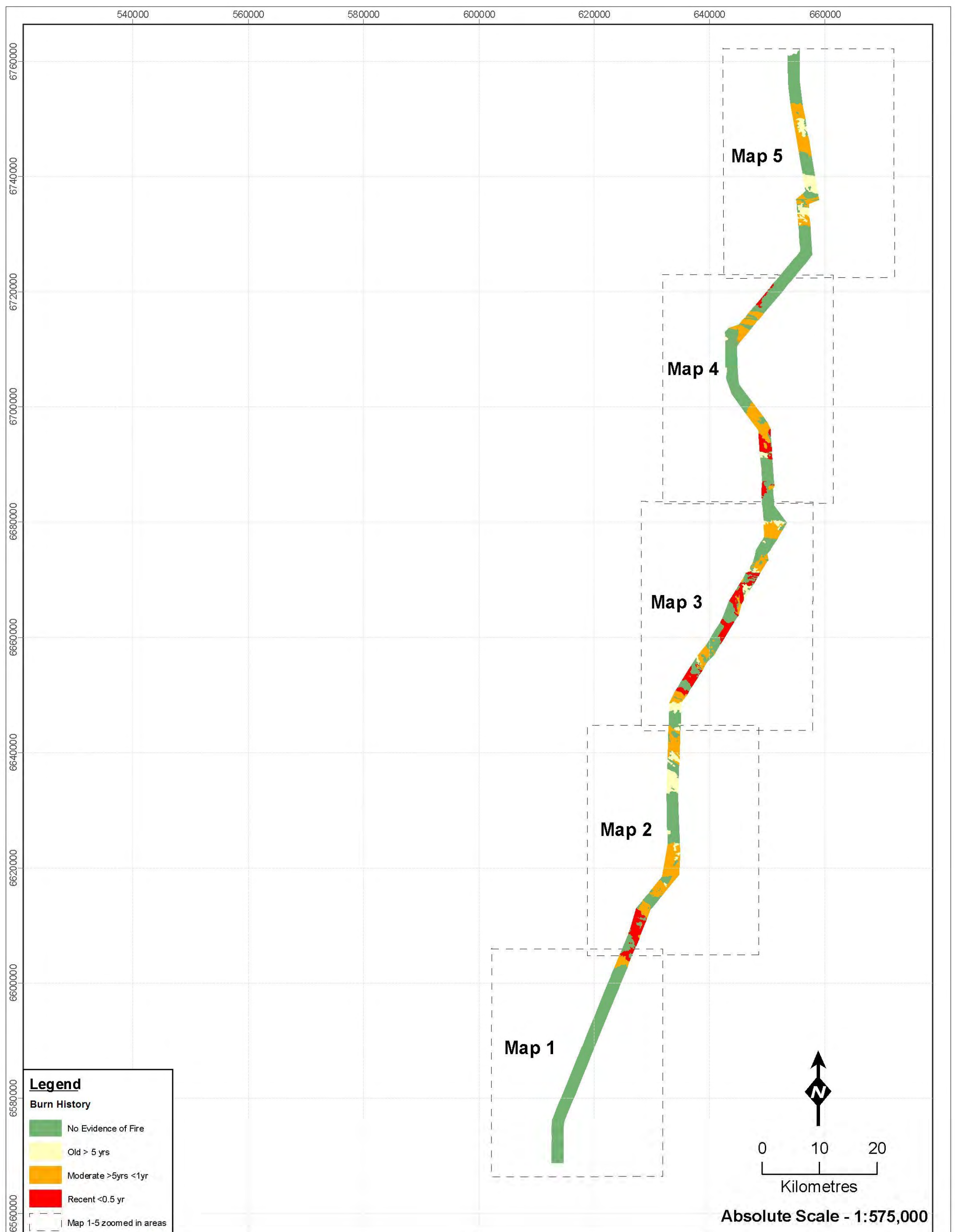
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APPENDIX I: Maps indicating areas of vegetation burnt along the Corridor within five years of the survey



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Legend

Burn History

- No Evidence of Fire
- Old > 5 yrs
- Moderate >5yrs <1yr
- Recent <0.5 yr
- Map 1-5 zoomed in areas

0 10 20
Kilometres

Absolute Scale - 1:575,000



**Tropicana-Transline
Infrastructure Corridor
Burn History Overview**

Figure: I.1
Project ID: 829

Drawn: SH
Date: 30/06/09

Coordinate System
Name: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994



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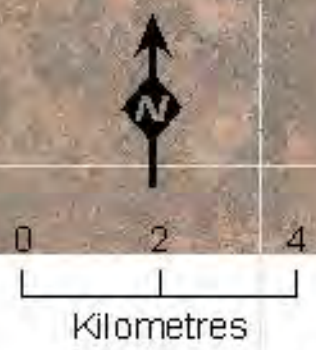
610000 620000 630000

6600000
6690000
6680000
6670000



Legend
Burn History

- No Evidence of Fire
- Old > 5 yrs
- Moderate > 5yrs < 1yr
- Recent < 0.5yr



Absolute Scale - 1:110,000



Tropicana-Transline
 Infrastructure Corridor
 Burn History

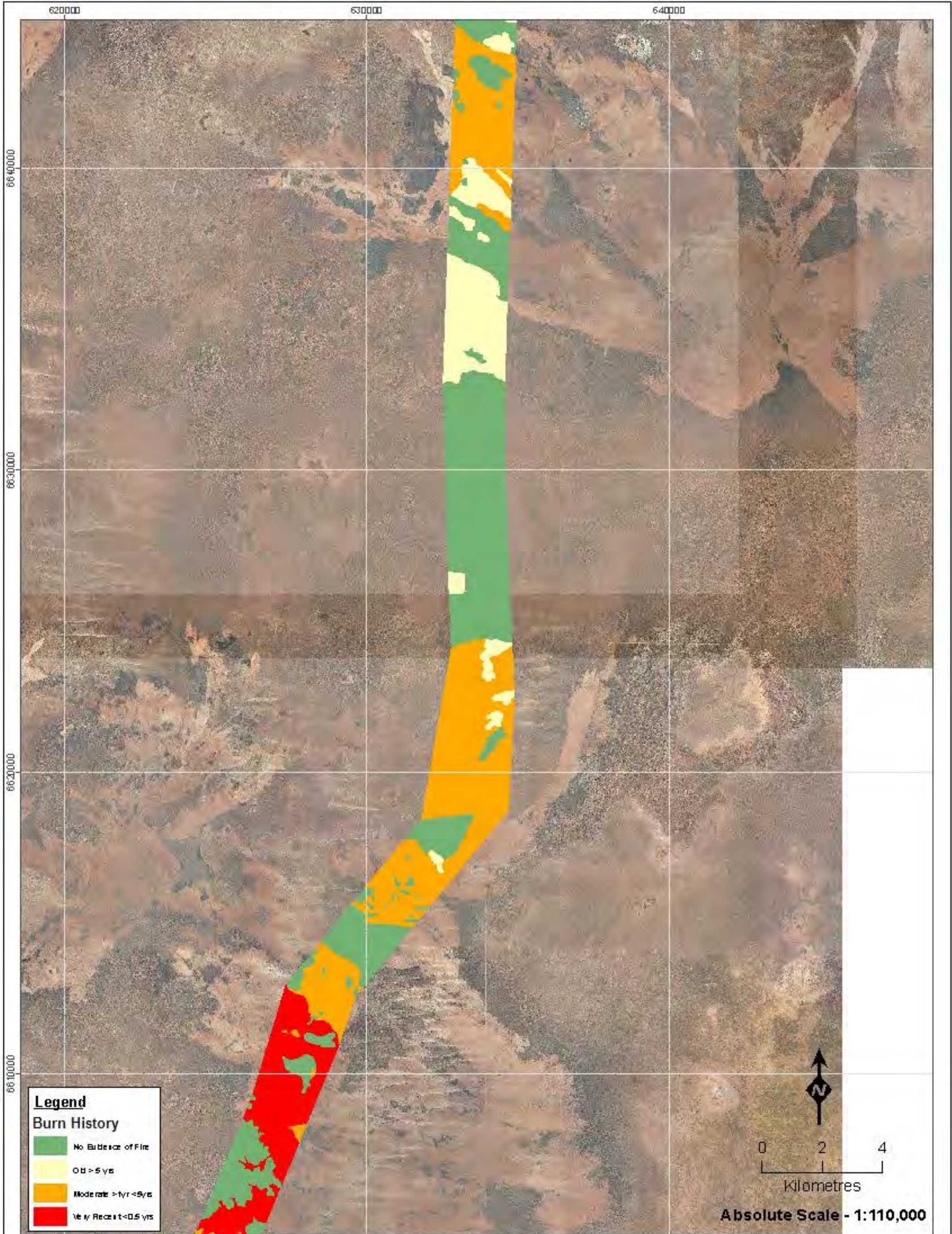
Figure: J.2
 Project ID: 829

Drawn: SH
 Date: 30/06/09

Coordinate System
 Name: GDA 1994 MGA Zone 50
 Projection: Transverse Mercator
 Datum: GDA 1994




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Legend
Burn History

- No Evidence of Fire
- Old > 5 yrs
- Moderate > 1yr <= 5yrs
- Very Recent <= 0.5 yrs


 0 2 4
 Kilometres
Absolute Scale - 1:110,000




**Tropicana-Transline
 Infrastructure Corridor
 Burn History**

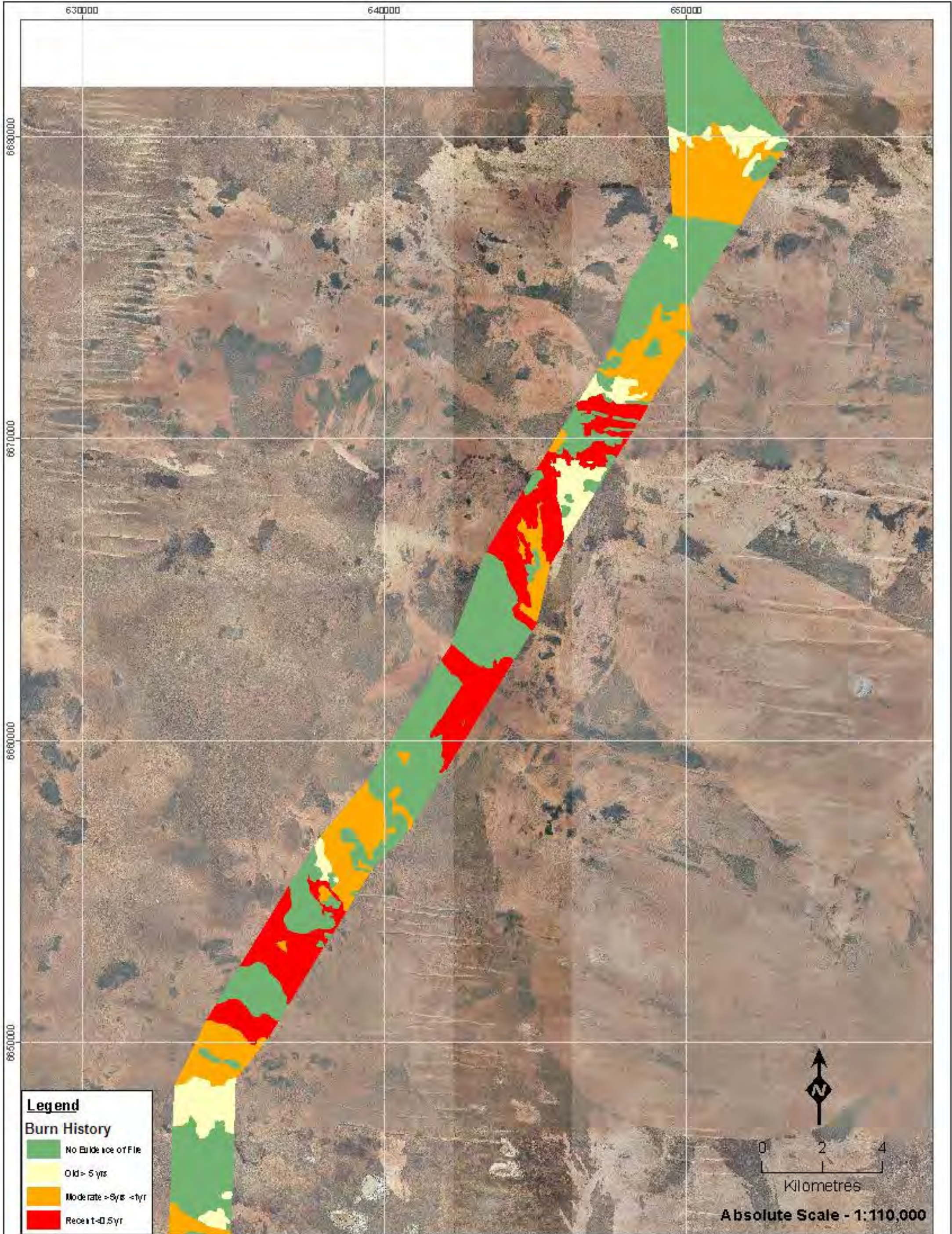
Figure: I.3
Project ID: 829

Drawn: SH
Date: 30/06/09


Coordinate System
 Name : GDA 1994 MGA Zone 50
 Projection : Transverse Mercator
 Datum : G DA 1994



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Legend
Burn History
 No Evidence of Fire
 Old > 5 yrs
 Moderate > 5yrs < 1yr
 Recent < 0.5yr


 0 2 4
 Kilometres
Absolute Scale - 1:110,000



**Tropicana-Transline
 Infrastructure Corridor
 Burn History**

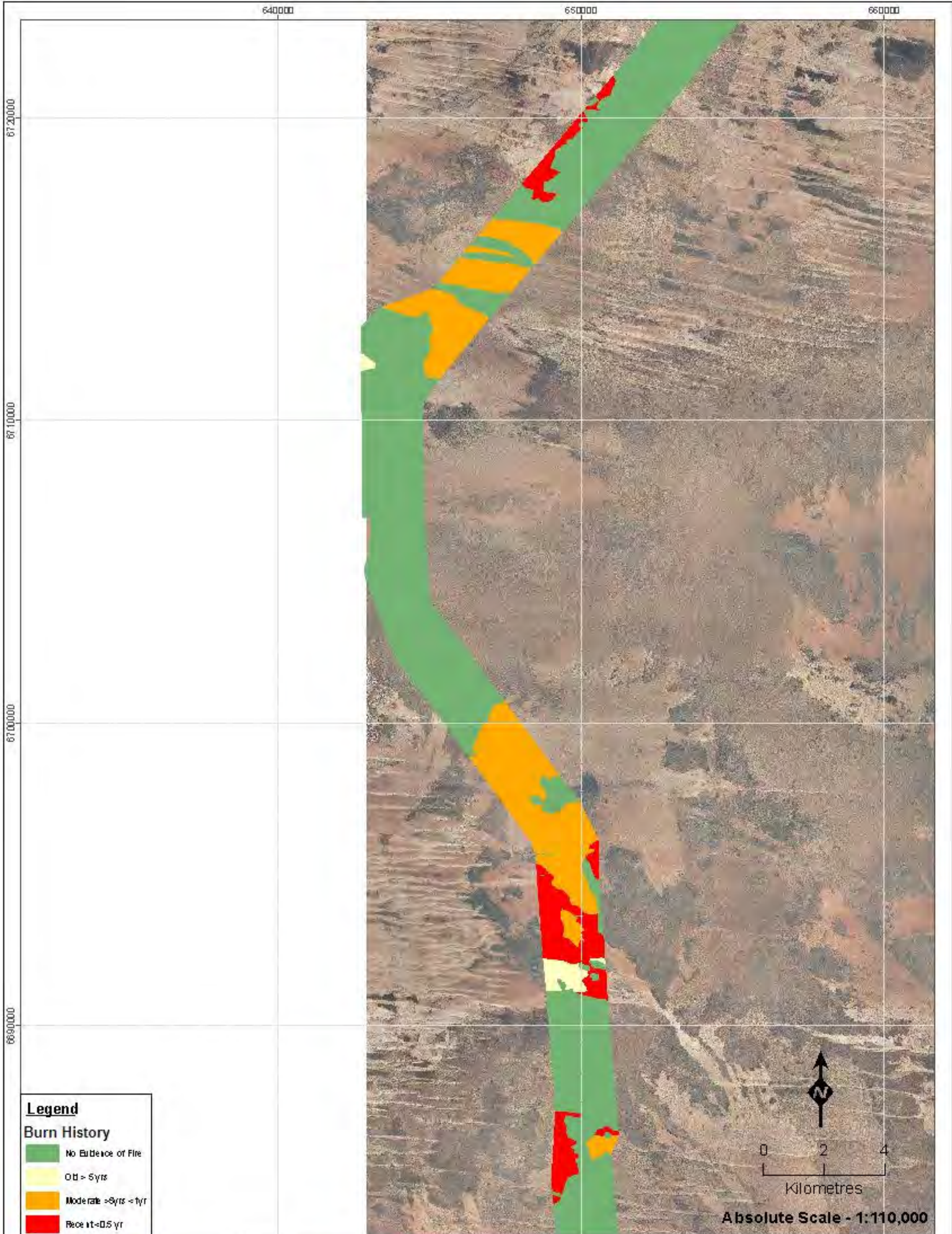
Figure: I.4
Project ID: 829

Drawn: SH
Date: 30/06/09

Coordinate System
 Name : GDA 1994 MGA Zone 50
 Projection : Transverse Mercator
 Datum : GDA 1994



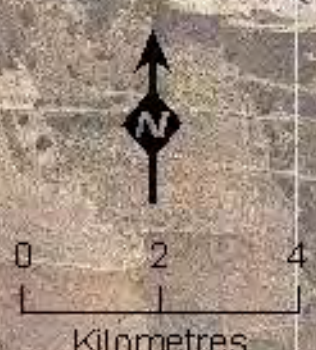
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Legend

Burn History

- No Evidence of Fire
- Old > 5yrs
- Moderate <=5yrs < 1yr
- Recent <=0.5 yr



Absolute Scale - 1:110,000



**Tropicana-Transline
Infrastructure Corridor
Burn History**

**Figure: 1.5
Project ID: 829**

**Drawn: SH
Date: 30/06/09**

Coordinate System
Name : GDA 1994 MGA Zone 50
Projection : Transverse Mercator
Datum : GDA 1994



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650000

660000

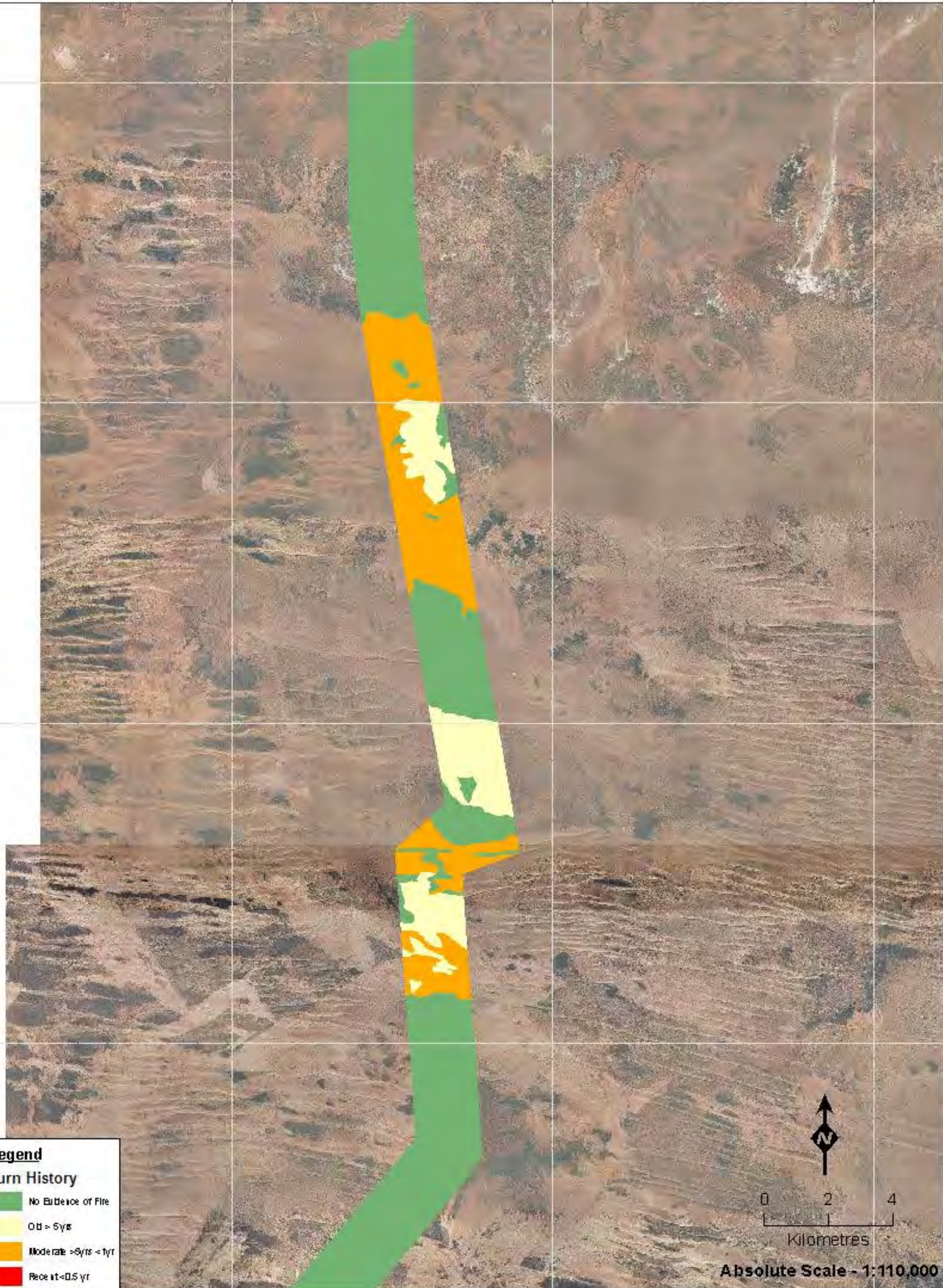
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Legend
Burn History

- No Evidence of Fire
- Old > 5yrs
- Moderate >3yrs < 1yr
- Recent <0.5 yr



Absolute Scale - 1:110,000



Tropicana-Transline
 Infrastructure Corridor
 Burn History

Figure: I.6
 Project ID: 829

Drawn: SH
 Date: 30/06/09

Coordinate System
 Name : GDA 1994 MGA Zone 50
 Projection : Transverse Mercator
 Datum : G DA 1994



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APPENDIX J: Risk assessment



Vegetation and Flora Environmental Impact Risk Assessment											
AGAA: Tropicana-Transline Infrastructure Corridor		Location: Tropicana JV Gold Project				Date: June 2009					
Process/Activity	Event	Impact	Inherent Risk				Controls	Residual Risk			
			Likelihood	Consequence	Risk Level	Significance		Likelihood	Consequence	Risk Level	Significance
Vegetation Clearing	Removal of vegetation and flora	Loss of biodiversity	5	3	15	High	Clearing should be restricted to that which is necessary. Any cleared areas not in use should be rehabilitated as soon as possible.	4	2	8	Mod
Vegetation Clearing	Removal of vegetation and flora	Adverse impact to ecological function	3	3	9	Mod	Clearing should be restricted to that which is necessary. Any cleared areas not in use should be rehabilitated to reduce long term ecological impact.	3	3	9	Mod
Vegetation Clearing	Removal of vegetation and flora	Loss of conservation significant flora in the project area	4	4	16	High	Fifteen conservation significant flora taxa and no conservation significant ecosystems were recorded along the Corridor. However, as not all of the area was surveyed other conservation significant taxa may be present. Before clearing photographs of the 15 taxa and others recorded in the greater Tropicana project area should be obtained and provided to Environmental personnel to ensure that as few as possible of the conservation significant taxa are impacted.	3	2	6	Mod
Human Presence	Increased weed species	Increased competition pressure on native flora	3	3	9	Mod	Weed hygiene measures should be employed to prevent the movement of weeds to and from areas of infestation. A weed eradication program could be implemented.	2	3	6	Mod



Vegetation and Flora Environmental Impact Risk Assessment											
AGAA: Tropicana-Transline Infrastructure Corridor		Location: Tropicana JV Gold Project				Date: June 2009					
Process/Activity	Event	Impact	Inherent Risk				Controls	Residual Risk			
			Likelihood	Consequence	Risk Level	Significance		Likelihood	Consequence	Risk Level	Significance
Construction	Fire	Destruction of vegetation	2	3	6	Mod	Ensure that fire extinguishers are available to work personnel, and that they are trained in their use. Fire prevention to be an integral part of contractor HSE planning. Smoking near vegetated areas, particularly highly flammable spinifex, should be prohibited.	1	4	4	Low
Construction	Fire	Destruction of flora of conservation significance	2	4	8	Mod	Fifteen conservation significant flora taxa were recorded along the Corridor. However, others might exist in areas not surveyed. Ensure that fire extinguishers are available to work personnel, and that personnel are trained in their use. Fire prevention to be an integral part of contractor HSE planning. Smoking near vegetated areas, particularly highly flammable spinifex, should be prohibited.	3	2	6	Mod
Construction and clearing	Dust degradation of native vegetation	Loss of vegetation	3	3	9	Mod	Dust suppression measures should be utilised during construction and clearing, e.g. water carts.	3	3	9	Mod
Construction and clearing	Vegetation destruction from off-track driving	Direct loss of vegetation	3	3	9	Mod	Off track driving is to be prohibited or restricted.	2	2	6	Mod



Risk Matrix							
Risk Assessment Rating		LIKELIHOOD					
		5	4	3	2	1	
		ALMOST CERTAIN	LIKELY	POSSIBLE	UNLIKELY	RARE	
		Is expected to occur in most circumstance	Will probably occur in most circumstance	Could occur	Could occur but not expected	Occurs in exceptional circumstances	
CONSEQUENCES	5 - CATASTROPHIC	Significant impact to flora species of conservation significance or regional biodiversity	25	20	15	10	5
	4 - MAJOR		20	16	12	8	4
	3 - MODERATE	Impact to flora species of conservation significance in project area.	15	12	9	6	3
	2 - MINOR	Loss of flora biodiversity in project area.	10	8	6	4	2
	1 - INSIGNIFICANT	Short term or localised impact to flora biodiversity.	5	4	3	2	1
		No impact to flora of conservation significance or biodiversity.					
	11-25	High risk, site/issue specific management programmes required, advice/approval from regulators required.					
	6 – 10	Medium risk, specific management and procedures must be specified.					



APPENDIX K: Analysis of incompletely identified collections within the Transline Infrastructure Corridor



Table 1: Analysis of incompletely identified collections within the Transline Infrastructure Corridor						
IBRA regions in which taxon recorded	Genus species	# Taxa within genera previously recorded within GVD (FloraBase)			Taxa collected (C) or not collected (NC) during current survey.	Comment
		Total #	# Not collected in the survey	# Priority or DRF taxa not collected in the survey		
GVD	<i>Acacia</i> sp.	55	35	0	Non Priority taxa too numerous to list. Priority taxa are: <i>Acacia eremophila</i> numerous-nerved variant (P3) (C)	The only Priority taxon currently known within the GVD was recorded in the survey so indeterminant record is considered unlikely to be any other taxon of conservation status
GVD	? <i>Agrostis</i> sp.	0	0	0	None within region	If an <i>Agrostis</i> species, this is likely to be one of the 4 introduced <i>Agrostis</i> species, none of which are currently known from within the GVD
GVD	<i>Allocasuarina</i> ? <i>helmsii</i>	6	4	0	<i>Allocasuarina acutivalvis</i> (C) <i>Allocasuarina acutivalvis</i> subsp. <i>acutivalvis</i> (C) <i>Allocasuarina corniculata</i> (NC) <i>Allocasuarina decaisneana</i> (NC) <i>Allocasuarina helmsii</i> (C) <i>Allocasuarina spinosissima</i> (C)	No DRF or Priority taxa within this genus are currently known within the GVD so indeterminants are considered unlikely to be of conservation status
Near COO / NUL boundary	<i>Atriplex</i> ? <i>vesicaria</i>	10	4	1	<i>Atriplex acutibractea</i> subsp. <i>acutibractea</i> <i>Atriplex acutibractea</i> <i>Atriplex acutibractea</i> subsp. <i>karoniensis</i> <i>Atriplex amnicola</i> <i>Atriplex bunburyana</i> <i>Atriplex cinerea</i> <i>Atriplex codonocarpa</i> <i>Atriplex cryptocarpa</i> <i>Atriplex eardleyae</i> <i>Atriplex holocarpa</i> <i>Atriplex hymenotheca</i>	Almost certainly a poor specimen of <i>A. vesicaria</i> . <i>A. lindleyi</i> subsp. <i>conduplicata</i> is a small herb occurring on crabhole plains and does not closely resemble <i>A. vesicaria</i> .



Table 1: Analysis of incompletely identified collections within the Transline Infrastructure Corridor						
IBRA regions in which taxon recorded	Genus species	# Taxa within genera previously recorded within GVD (FloraBase)			Taxa collected (C) or not collected (NC) during current survey.	Comment
		Total #	# Not collected in the survey	# Priority or DRF taxa not collected in the survey		
					<i>Atriplex lindleyi</i> <i>Atriplex lindleyi</i> subsp. <i>conduplicata</i> (P3) <i>Atriplex lindleyi</i> subsp. <i>inflata</i> <i>Atriplex limbata</i> <i>Atriplex nana</i> <i>Atriplex nummularia</i> <i>Atriplex nummularia</i> subsp. <i>spathulata</i> <i>Atriplex paludosa</i> <i>Atriplex paludosa</i> subsp. <i>baudinii</i> <i>Atriplex pumilio</i> <i>Atriplex quinii</i> <i>Atriplex quadrivalvata</i> <i>ex quadrivalvata ar. quadrivalvata</i> <i>Atriplex semibaccata</i> <i>Atriplex semilunaris</i> <i>Atriplex spongiosa</i> <i>Atriplex stipitata</i> <i>Atriplex suberecta</i> <i>Atriplex vesicaria</i>	
GVD	<i>Brachyscome ?blackii</i> <i>Brachyscome</i> sp.	6	5	0	<i>Brachyscome blackii</i> (NC) <i>Brachyscome ciliaris</i> (NC) <i>Brachyscome ciliaris</i> var. <i>lanuginosa</i> (NC) <i>Brachyscome iberidifolia</i> (C) <i>Brachyscome oncocarpa</i> (NC) <i>Brachyscome tesquorum</i> (NC)	No DRF or Priority taxa currently known within the GVD so indeterminants considered unlikely to be of conservation status



Table 1: Analysis of incompletely identified collections within the Transline Infrastructure Corridor						
IBRA regions in which taxon recorded	Genus species	# Taxa within genera previously recorded within GVD (FloraBase)			Taxa collected (C) or not collected (NC) during current survey.	Comment
		Total #	# Not collected in the survey	# Priority or DRF taxa not collected in the survey		
GVD / COO	<i>Calandrinia</i> sp.	8	0	1	<i>Calandrinia granulifera</i> (NC) <i>Calandrinia eremaea</i> (NC) <i>Calandrinia polyandra</i> (NC) <i>Calandrinia porifera</i> (P3) (NC) <i>Calandrinia Ptychosperma</i> (NC) <i>Calandrinia</i> sp. <i>Bungalbin</i> (NC) <i>Calandrinia</i> sp. <i>Needilup</i> (NC) <i>Calandrinia</i> sp. <i>ridged papillate</i> (NC)	<i>C. porifera</i> displays a preference for granite rocks. Therefore considered relatively unlikely based on the limited availability of the known habitat preferences within the survey area.
COO	<i>Casuarina ?pauper</i>	2	1	0	<i>Casuarina obesa</i> (NC) <i>Casuarina pauper</i> (C)	No DRF or Priority taxa currently known within the COO so indeterminants considered unlikely to be of conservation status
GVD	<i>Daviesia</i> sp.	7	0	0	<i>Daviesia benthamii</i> (C) <i>Daviesia benthamii</i> subsp. <i>acanthoclona</i> (C) <i>Daviesia grahamii</i> (C) <i>Daviesia purpurascens</i> (P4) (C) <i>Daviesia</i> sp. Kanandah (R. Davis 10604) (C) <i>Daviesia ulicifolia</i> (C) <i>Daviesia ulicifolia</i> subsp. <i>aridicola</i> (C)	<i>D. purpurascens</i> collected during survey, so indeterminate may be this taxon
GVD	<i>Dicrastylis ?nicholasii</i> <i>Dicrastylis</i> sp.	5	2	0	<i>Dicrastylis brunnea</i> (C) <i>Dicrastylis costelloi</i> (NC) <i>Dicrastylis cundeeleensis</i> (P3) (C) <i>Dicrastylis doranii</i> (NC) <i>Dicrastylis nicholasii</i> P2 (C) <i>Dicrastylis parvifolia</i> (C)	Both <i>D. cundeeleensis</i> and <i>D. nicholasii</i> were collected during the survey. The indeterminate collection is likely to be <i>D. nicholasii</i> which is abundant and widely distributed within the survey area.



Table 1: Analysis of incompletely identified collections within the Transline Infrastructure Corridor						
IBRA regions in which taxon recorded	Genus species	# Taxa within genera previously recorded within GVD (FloraBase)			Taxa collected (C) or not collected (NC) during current survey.	Comment
		Total #	# Not collected in the survey	# Priority or DRF taxa not collected in the survey		
GVD	<i>Dodonaea viscosa</i> subsp. ? <i>angustissima</i>	9	7	0	<i>Dodonaea adenophora</i> (C) <i>Dodonaea lobulata</i> (C) <i>Dodonaea microzyga</i> (C) <i>Dodonaea microzyga</i> var. <i>acrolobata</i> (C) <i>Dodonaea rigida</i> (NC) <i>Dodonaea stenozyga</i> (C) <i>Dodonaea viscosa</i> (C) <i>Dodonaea viscosa</i> subsp. <i>angustissima</i> (C) <i>Dodonaea viscosa</i> subsp. <i>mucronata</i> (NC)	No DRF or Priority taxa currently known within the GVD so indeterminants considered unlikely to be of conservation status
GVD	<i>Eragrostis</i> sp.	12	8	0	<i>Eragrostis australasica</i> (NC) <i>Eragrostis dielsii</i> (C) <i>Eragrostis eriopoda</i> (C) <i>Eragrostis falcata</i> (NC) <i>Eragrostis kennedyae</i> (NC) <i>Eragrostis lacunaria</i> (NC) <i>Eragrostis laniflora</i> (NC) <i>Eragrostis leptocarpa</i> (NC) <i>Eragrostis parviflora</i> (NC) <i>Eragrostis pergracilis</i> (NC) <i>Eragrostis setifolia</i> (C) <i>Eragrostis xerophila</i> (C)	No DRF or Priority taxa currently known within the GVD so indeterminants considered unlikely to be of conservation status



Table 1: Analysis of incompletely identified collections within the Transline Infrastructure Corridor						
IBRA regions in which taxon recorded	Genus species	# Taxa within genera previously recorded within GVD (FloraBase)			Taxa collected (C) or not collected (NC) during current survey.	Comment
		Total #	# Not collected in the survey	# Priority or DRF taxa not collected in the survey		
GVD	<i>Eremophila ?alternifolia</i> <i>Eremophila ?falcata</i> <i>Eremophila ?glabra</i> var. <i>albicans</i> <i>Eremophila ?undulata</i> <i>Eremophila gilesii</i> subsp. <i>?variabilis</i> <i>Eremophila</i> sp.	57	39	3	Non Priority taxa too numerous to list. Priority taxa are: <i>Eremophila aurievisca</i> (P1) (NC) <i>Eremophila dendritica</i> (P3) (NC) <i>Eremophila revoluta</i> (P2) (NC) <i>Eremophila undulata</i> (P2) (possibly collected)	Given the large number of taxa within this genus within the GVD it is unlikely the indeterminate specimens are Priority taxa, however based on known distribution and habitat preferences: <i>E. aurievisca</i> is possible based on known distribution and habitat. <i>E. dendritica</i> is possible based on known distribution and habitat <i>E. revoluta</i> unlikely to be indeterminate due to very distinctive small leaves <i>E. undulata</i> is a relatively distinctive taxon even when sterile due to undulate leaves, tomentose stem and leaves. This taxon has been included in the discussion as possibly occurring.
GVD / COO / NUL	<i>Eremophila ?glabra</i> <i>Eremophila ?latrobei</i> <i>?Eremophila</i> sp.	87	39	20	Non Priority taxa too numerous to list. Priority taxa are: <i>Eremophila arachnoides</i> subsp. <i>tenera</i> (P1)(NC) <i>Eremophila attenuata</i> (P1) (NC) <i>Eremophila aurievisca</i> (P1) (NC) <i>Eremophila biserrata</i> (P4) <i>Eremophila caerulea</i> subsp. <i>merrallii</i> (P4)	Given the very large number of taxa within this genus within the three IBRA regions, it is considered unlikely the indeterminate specimens are from Priority taxa rather than the species tentatively identified or soother non-Priority species. However the possibility cannot be completely



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					(NC) <i>Eremophila dendritica</i> (P3) (NC) <i>Eremophila denticulata</i> subsp. <i>trisulcata</i> (DRF) (NC) <i>Eremophila hillii</i> (P4) (NC) <i>Eremophila lucida</i> (P1) (NC) <i>Eremophila parvifolia</i> subsp. <i>parvifolia</i> (P4) (NC) <i>Eremophila perglandulosa</i> (P1) (NC) <i>Eremophila praecox</i> (P1) (NC) <i>Eremophila purpurascens</i> (P3) (NC) <i>Eremophila racemosa</i> (P4) (NC) <i>Eremophila revoluta</i> (P2) (NC) <i>Eremophila serpens</i> (P4) (NC) <i>Eremophila succinea</i> (P3) (NC) <i>Eremophila undulata</i> (P2) (possibly collected) <i>Eremophila veronica</i> (P3) (NC) <i>Eremophila virens</i> (DRF) (NC) <i>Eremophila viscida</i> (DRF) (NC)	excluded.



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GVD	<i>Eucalyptus ?gracilis</i> <i>Eucalyptus ?mannensis</i> <i>Eucalyptus ?rigidula</i> <i>Eucalyptus ?sheathiana</i> <i>Eucalyptus ?youngiana</i>	69	41	4	Non Priority taxa too numerous to list. DRF/Priority taxa are: <i>Eucalyptus articulata</i> (DRF) (NC) <i>Eucalyptus nigrifunda</i> (P4) (NC) <i>Eucalyptus pimpiniana</i> (P3) (NC) <i>Eucalyptus sparsa</i> (P3) (NC)	Given the very large number of taxa within this genus within the GVD it is considered unlikely the indeterminate specimen is a Priority rather than the species tentatively identified. However as <i>Eucalyptus</i> species are very difficult to identify with incomplete material the possibility cannot be completely excluded.
GVD / COO / NUL	<i>Eucalyptus</i> sp.	>250	25	25	<i>Eucalyptus articulata</i> (DRF) (NC) <i>Eucalyptus brevipes</i> (DRF) <i>Eucalyptus brockwayi</i> (P3) <i>Eucalyptus caesia</i> (P4) <i>Eucalyptus cerasiformis</i> (P4) <i>Eucalyptus crucis</i> subsp. <i>crucis</i> (DRF) <i>Eucalyptus deflexa</i> (P4) <i>Eucalyptus educta</i> (P2) <i>Eucalyptus exigua</i> (P3) <i>Eucalyptus formanii</i> (P4) <i>Eucalyptus fraseri</i> subsp. <i>melanobasis</i> (P2) <i>Eucalyptus georgei</i> subsp. <i>fulgida</i> (P4) <i>Eucalyptus georgei</i> subsp. <i>georgei</i> (P4) <i>Eucalyptus histophylla</i> (P3) <i>Eucalyptus jimberlanica</i> (P1) <i>Eucalyptus jutsonii</i> (P2) <i>Eucalyptus kruseana</i> (P4) <i>Eucalyptus myriadena</i> subsp. <i>parviflora</i> (P1) <i>Eucalyptus nigrifunda</i> (P4) (NC)	Given the very large number of taxa within this genus within the three IBRA regions, it is considered unlikely the indeterminate specimen is from Priority/DRF taxa rather than the tentatively identified species or other non-Priority species. However the possibility cannot be completely excluded



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IBRA regions in which taxon recorded	Genus species	# Taxa within genera previously recorded within GVD (FloraBase)			Taxa collected (C) or not collected (NC) during current survey.	Comment
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					<i>Eucalyptus pimpiniana</i> (P3) <i>Eucalyptus platydisca</i> (DRF) <i>Eucalyptus pterocarpa</i> (P4) <i>Eucalyptus rhomboidea</i> (P4) <i>Eucalyptus sparsa</i> (P3) (NC) <i>Eucalyptus steedmanii</i> (DRF)	
GVD	<i>Goodenia ?glandulosa</i> <i>Goodenia ?triodiophila</i>	14	6	0	<i>Goodenia centralis</i> (NC) <i>Goodenia elderi</i> (C) <i>Goodenia glandulosa</i> (C) <i>Goodenia havilandii</i> (C) <i>Goodenia macropectra</i> (NC) <i>Goodenia mimuloides</i> (NC) <i>Goodenia occidentalis</i> (NC) <i>Goodenia peacockiana</i> (NC) <i>Goodenia pinnatifida</i> (NC) <i>Goodenia quasilibera</i> (NC) <i>Goodenia ramelii</i> (C) <i>Goodenia scaevolina</i> (NC) <i>Goodenia triodiophila</i> (C) <i>Goodenia xanthosperma</i> (C)	No DRF or Priority taxa currently known within the GVD so indeterminants considered unlikely to be of conservation status
GVD	<i>Grevillea ?nematophylla</i>	24	12	0	Non Priority taxa too numerous to list. DRF/Priority taxon is: <i>Grevillea secunda</i> (P2) (C)	Likely to be a poor specimen of <i>G. nematophylla</i> rather than <i>G. secunda</i> ..



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		Total #	# Not collected in the survey	# Priority or DRF taxa not collected in the survey		
COO / NUL	<i>Hakea ?rhombales</i>	22	2	2	Non Priority taxa too numerous to list. DRF/Priority taxa are: <i>Hakea pendens</i> (P2) (NC) <i>Hakea rigida</i> (P2) (NC)	Although not previously lodged from the GVD <i>H. rhombales</i> has been recorded near the southern boundary of the Gibson Desert. The possibility of Priority taxa cannot completely excluded but is less likely based on the form of specimen.
GVD	<i>Halgania</i> sp.	8	3	0	<i>Halgania cyanea</i> (C) <i>Halgania cyanea</i> var. <i>Allambie Stn</i> (C) <i>Halgania cyanea</i> var. <i>Charleville</i> (NC) <i>Halgania cyanea</i> var. <i>cyanea</i> (C) <i>Halgania erecta</i> (NC) <i>Halgania integerrima</i> (C) <i>Halgania solanacea</i> (NC) <i>Halgania solanacea</i> var. <i>Mt Doreen</i> (NC)	No DRF or Priority taxa currently known within the GVD so indeterminant is considered unlikely to be of conservation status
COO / NUL	<i>Maireana ?georgei</i>	23	16	0	Non Priority taxa too numerous to list	No DRF or Priority taxa currently known within the NUL or COO so indeterminant considered unlikely to be of conservation status.
GVD	<i>Psydrax ?ammophila</i>	3	2	0	<i>Psydrax ammophila</i> (NC) <i>Psydrax latifolia</i> (C) <i>Psydrax rigidula</i> (NC)	No DRF or Priority taxa currently known within the GVD so indeterminant considered unlikely to be of conservation status.
GVD	<i>Ptilotus</i> sp.	20	12	1	<i>Ptilotus aevoides</i> (NC) <i>Ptilotus blackii</i> (P3) (NC) <i>Ptilotus calostachyus</i> (NC) <i>Ptilotus chamaecladus</i> (NC) <i>Ptilotus chippendalei</i> (NC)	Given the large number of taxa within this genus within the GVD it is considered unlikely the indeterminate specimen is <i>P. blackii</i> however the possibility cannot be entirely excluded



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		Total #	# Not collected in the survey	# Priority or DRF taxa not collected in the survey		
					<i>Ptilotus clementii</i> (NC) <i>Ptilotus drummondii</i> (NC) <i>Ptilotus exaltatus</i> (C) <i>Ptilotus exaltatus</i> var. <i>exaltatus</i> (C) <i>Ptilotus exaltatus</i> var. <i>villosus</i> (C) <i>Ptilotus gaudichaudii</i> (NC) <i>Ptilotus gaudichaudii</i> var. <i>gaudichaudii</i> (NC) <i>Ptilotus helichrysoides</i> (NC) <i>Ptilotus helipteroides</i> (NC) <i>Ptilotus macrocephalus</i> (NC) <i>Ptilotus obovatus</i> (C) <i>Ptilotus polystachyus</i> (C) <i>Ptilotus polystachyus</i> var. <i>polystachyus</i> (C) <i>Ptilotus sessilifolius</i> (C) <i>Ptilotus stipitatus</i> (NC)	on the basis of form, distribution or habitat preferences.
COO / NUL	<i>Ptilotus ?holosericeus</i>	28	19	1	Non Priority taxa too numerous to list. Priority taxon: <i>Ptilotus blackii</i> (P3) (NC)	Given the large number of taxa within this genus within the NUL and COO and its resemblance to <i>P. holosericeus</i> it is considered highly unlikely the indeterminate specimen is <i>P. blackii</i> .
GVD / COO / NUL	<i>Rhagodia ?eremaea</i> <i>Rhagodia</i> sp	8	4	0	<i>Rhagodia crassifolia</i> (NC) <i>Rhagodia drummondii</i> (C) <i>Rhagodia eremaea</i> (C) <i>Rhagodia preissii</i> (NC) <i>Rhagodia preissii</i> subsp. <i>preissii</i> (NC) <i>Rhagodia spinescens</i> (C) <i>Rhagodia ulicina</i> (NC) <i>Ptilotus sessilifolius</i> var. <i>sessilifolius</i> (NC)	No DRF or Priority taxa currently known within the GVD, COO or NUL so indeterminants considered unlikely to be of conservation status



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NUL	<i>Rhodanthe ?floribunda</i>	7	5	0	<i>Rhodanthe chlorocephala</i> (NC) <i>Rhodanthe chlorocephala</i> subsp. <i>rosea</i> (NC) <i>Rhodanthe floribunda</i> (C) <i>Rhodanthe haigii</i> (C) <i>Rhodanthe maryonii</i> (NC) <i>Rhodanthe nullarborensis</i> (NC) <i>Rhodanthe stricta</i> (NC)	No DRF or Priority taxa currently known within NUL so indeterminant considered unlikely to be of conservation status
GVD	<i>Scaevola ?basedowii</i>	8	4	0	<i>Scaevola amblyanthera</i> (NC) <i>Scaevola amblyanthera</i> var. <i>centralis</i> (NC) <i>Scaevola basedowii</i> (C) <i>Scaevola collaris</i> (NC) <i>Scaevola parvifolia</i> (C) <i>Scaevola parvifolia</i> subsp. <i>acuminata</i> (NC) <i>Scaevola parvifolia</i> subsp. <i>parvifolia</i> (C) <i>Scaevola spinescens</i> (C)	No DRF or Priority taxa currently known within GVD so indeterminant considered unlikely to be of conservation status
GVD	<i>Sida ?fibulifera</i>	6	1	0	<i>Sida arenicola</i> (C) <i>Sida calyxhymenia</i> (C) <i>Sida fibulifera</i> (C) <i>Sida intricata</i> (NC) <i>Sida phaeotricha</i> (C) <i>Sida spodochroma</i> (C)	No DRF or Priority taxa currently known within the GVD so indeterminants considered unlikely to be of conservation status



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COO	<i>Sida ?spodochroma</i>	4	2	0	<i>Sida ammophila</i> (NC) <i>Sida calyxhymenia</i> (C) <i>Sida intricata</i> (NC) <i>Sida spodochroma</i> (C)	No DRF or Priority taxa currently known within the COO so indeterminants considered unlikely to be of conservation status
GVD	<i>Solanum ? ellipticum</i>	9	4	0	<i>Solanum centrale</i> (NC) <i>Solanum coactiliferum</i> (NC) <i>Solanum ferocissimum</i> (NC) <i>Solanum lasiophyllum</i> (C) <i>Solanum nummularium</i> (C) <i>Solanum orbiculatum</i> (C) <i>Solanum orbiculatum</i> subsp. <i>orbiculatum</i> (C) <i>Solanum plicatile</i> (C) <i>Solanum terraneum</i> (NC)	No DRF or Priority taxa currently known within the GVD so indeterminants considered unlikely to be of conservation status
NUL	<i>Solanum ?chippendalei</i>	9	3	0	<i>Solanum coactiliferum</i> (NC) <i>Solanum ellipticum</i> (?C) <i>Solanum hoplopetalum</i> (NC) <i>Solanum lasiophyllum</i> (C) <i>Solanum nigrum</i> (NC) <i>Solanum nummularium</i> (C) <i>Solanum orbiculatum</i> (C) <i>Solanum orbiculatum</i> subsp. <i>orbiculatum</i> (C) <i>Solanum plicatile</i> (C)	No DRF or Priority taxa currently known within the GVD so indeterminants considered unlikely to be of conservation status



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GVD	<i>Triodia ? desertorum</i>	10	5	0	<i>Triodia basedowii</i> (C) <i>Triodia concinna</i> (NC) <i>Triodia desertorum</i> (C) <i>Triodia helmsii</i> (NC) <i>Triodia melvillei</i> (NC) <i>Triodia pungens</i> (NC) <i>Triodia rigidissima</i> (C) <i>Triodia scariosa</i> (C) <i>Triodia schinzii</i> (C) <i>Triodia tomentosa</i> (NC)	No DRF or Priority taxa currently known within the GVD so indeterminant considered unlikely to be of conservation status
COO	<i>Triodia ?rigidissima</i> <i>Triodia</i> sp.	5		0	<i>Triodia desertorum</i> (C) <i>Triodia irritans</i> (C) <i>Triodia rigidissima</i> (?C) <i>Triodia scariosa</i> (C) <i>Triodia tomentose</i> (NC)	No DRF or Priority taxa currently known within the COO so indeterminants considered unlikely to be of conservation status
COO / NUL	<i>Vittadinia</i> sp.	12	10	0	<i>Vittadinia blackii</i> (NC) <i>Vittadinia cervicalis</i> (NC) <i>Vittadinia cervicalis</i> var. <i>cervicularis</i> (NC) <i>Vittadinia cuneata</i> (NC) <i>Vittadinia cuneatavar. cuneata</i> (NC) <i>Vittadinia dissecta</i> <i>Vittadinia dissecta</i> var. <i>hirta</i> (NC) <i>Vittadinia eremaea</i> <i>Vittadinia gracilis</i> (NC) <i>Vittadinia humerata</i> (NC) <i>Vittadinia nullarborensis</i> (NC) <i>Vittadinia sulcata</i> (NC)	No DRF or Priority taxa currently known within the COO or NUL so indeterminants considered unlikely to be of conservation status



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GVD	<i>Zygophyllum ?apiculatum</i>	8	2	0	<i>Zygophyllum apiculatum</i> (C) <i>Zygophyllum aurantiacum</i> (C) <i>Zygophyllum aurantiacum</i> subsp. <i>aurantiacum</i> (C) <i>Zygophyllum compressum</i> (NC) <i>Zygophyllum eremaeum</i> (C) <i>Zygophyllum iodocarpum</i> (C) <i>Zygophyllum ovatum</i> (C) <i>Zygophyllum simile</i> (NC)	No DRF or Priority taxa currently known within the GVD so indeterminants considered unlikely to be of conservation status