13 January 2024

ABN: 55 664 959 906

Level 1, 8 Richardson Street,
West Perth, Western Australia 6005

www.mineralminingservices.com.au

Department of Mines, Industry Regulation and Safety
Mineral House
100 Plain Street
East Perth WA 6004

Dear Sir / Madam,

RE: Native Vegetation Clearing Permit Application for East Sampson Dam Project

Mineral Mining Services (MMS) is proposing to commence development of the East Sampson Dam Project (the Project), which involves the formation of an underground and open pit mining void to extract gold ore. To support development, MMS are seeking a Native Vegetation Clearing Permit for clearing of up to 100 ha within a disturbance envelope of 146 ha for the purpose of mineral production and associated activities.

This letter provides context for proposed clearing and includes an assessment against the ten clearing Principles, as defined under Schedule 5 of the EP Act. The proposed clearing is unlikely to be at variance with any clearing principle.

Included within this letter are:

- A completed NVCP application form (NV-F01) (provided separately);
- An ESRI shapefile of the proposed disturbance envelope / clearing permit area (provided separately);
- Letter from Moho Resources Limited authorising MMS to conduct work on the Project tenements (Appendix A);
- Tenement data extracts (Appendix B); and
- Biological survey undertaken to support the application (Appendix C)

If you have any questions, please contact me on 0409 289 381 or via email at rob.ryan@mineralms.com.au.

Yours sincerely,

Rob Ryan
Chief Executive Officer
Mineral Mining Services Limited

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1. Proposed Activities

Mineral Mining Services (MMS) is proposing to develop the East Sampson Dam Project (the Project), which involves formation of an open pit mining void and provision for future underground extension with support infrastructure to extract gold ore for processing at the nearby Paddington Mill.

MMS will require clearing of native vegetation to allow construction and operation of mine activities including:

- Mining voids (underground box cut and open pit);
- Waste rock landforms (WRL);
- Run-of-mine (ROM) pad;
- Mine water ponds (MWP);
- Dewatering pipelines;
- Topsoil stockpiles;
- Other ancillary infrastructure.

A Mining Proposal for the Project will be submitted to Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) in conjunction with other supporting approvals required under applicable legislation prior to commencement of activities.

1.1 Location

The Project is located approximately 53km north-east of Kalgoorlie-Boulder, in the Goldfields region of Western Australia and lies within the City of Kalgoorlie-Boulder local government area. The Project is situated on a Pastoral Lease known as Mt Vetters. Immediately east of the Project is the Black Swan Nickel Mine operated by Poseidon Nickel Limited and to the west is the Golden Cities – Mulgarrie Mine operated by Norton Gold Fields Pty Ltd. The Project is accessed via haul roads owned by Poseidon Nickel limited and Norton Gold Fields Pty Ltd. The Project regional location is shown in Figure 1.

Clearing is proposed on two tenements, mining lease M27/263 and exploration licence E27/528-I. Tenement details are provided in Table 1 below. MMS is currently in the process of acquiring M27/263 and E27/528-I from Moho Resources Ltd who have provided written permission to commence approvals work on these tenements, attached as **Appendix A.** Access to the Project is via an existing track situated on E27/528-I. Only clearing related to track maintenance on E27/528- I will be carried out at this stage.

Table 1: Tenement details

Tenement ID	Holder 1	Area (ha)	Expiry
M27/263	Moho Resources Ltd	792.85	07/07/2039
E27/528-I	Moho Resources Ltd	2045 (9 BI)	09/11/2025

1.2 Disturbance Envelope

MMS is requesting a total allowable clearing area of 100 ha within a disturbance envelope of 146 ha as depicted in Figure 2 and Figure 3 (Note: proposed infrastructure layout is indicative only).

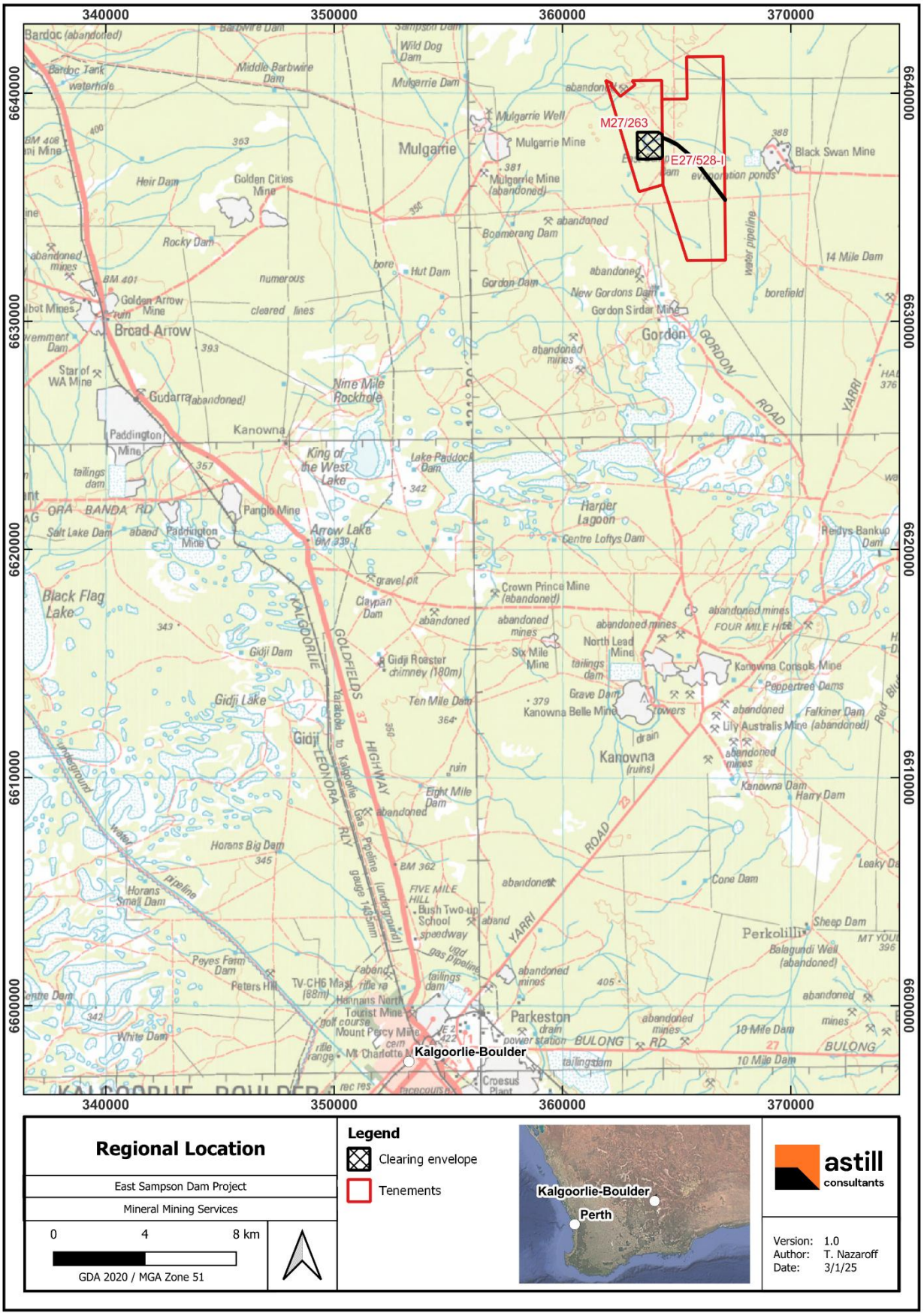

Figure 1: Regional location of the Project

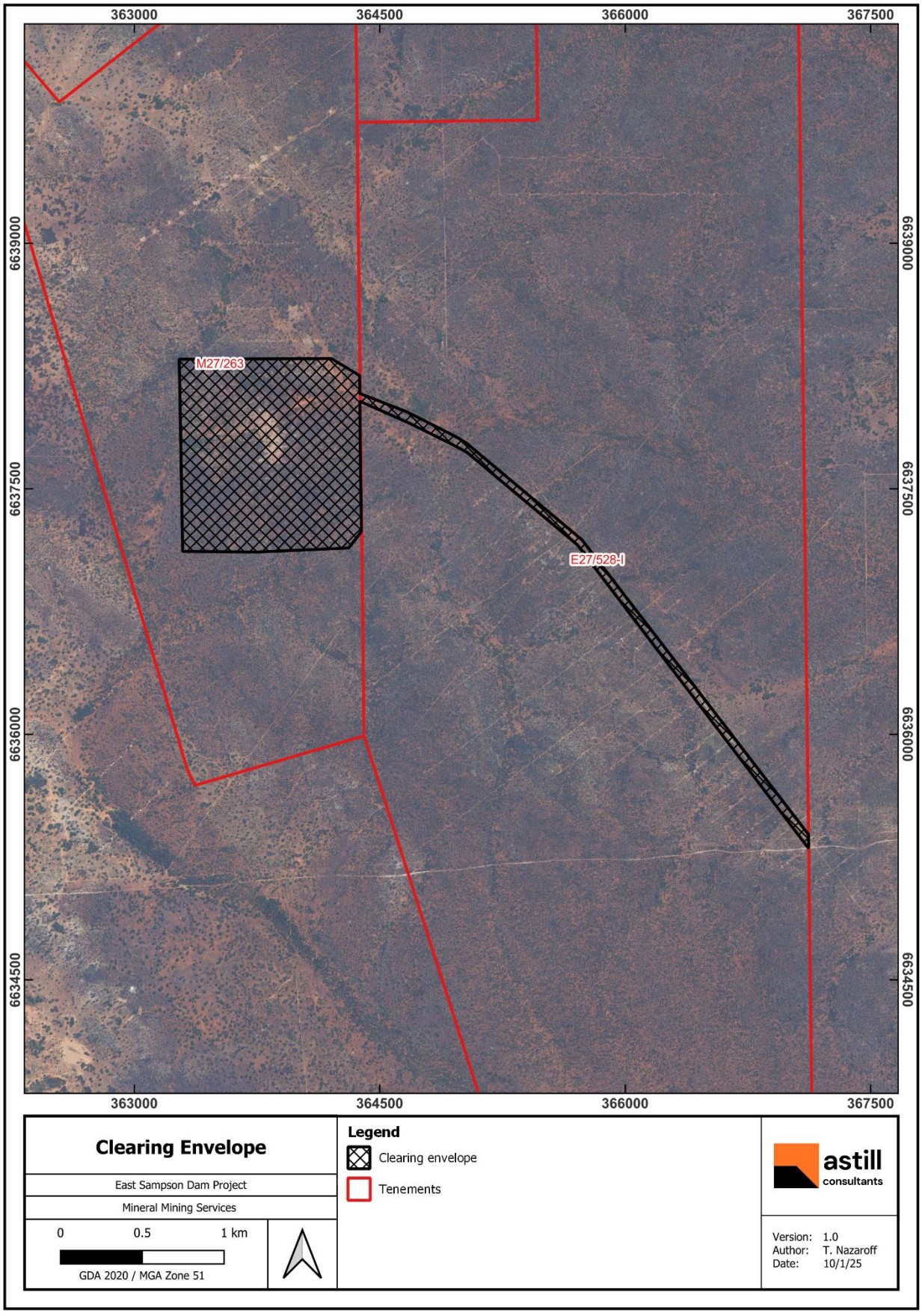

Figure 2: Clearing area

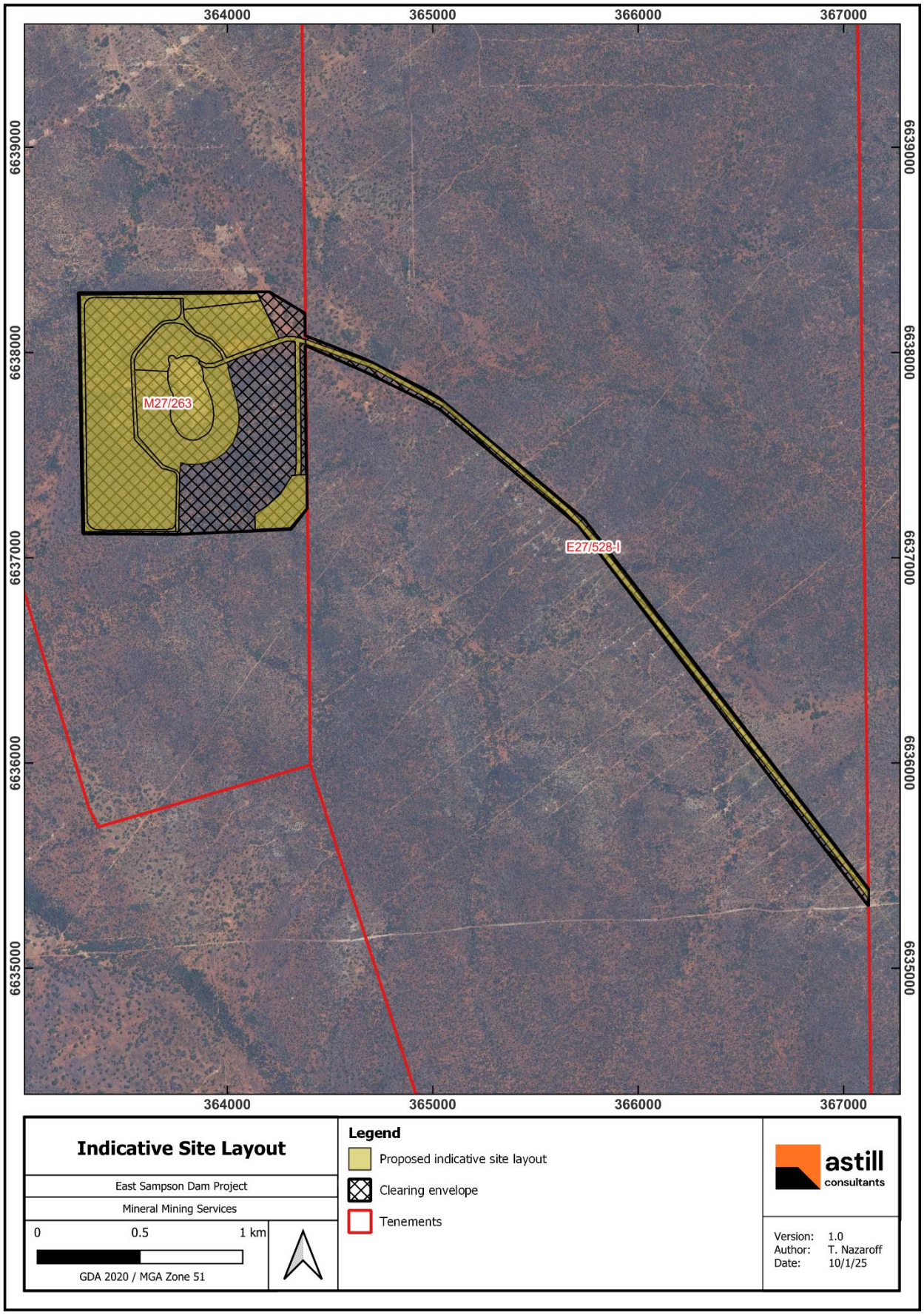

Figure 3: Indicative site plan

2. Environmental Setting

2.1 Climate

The Project is located near Kalgoorlie-Boulder, in the south of the Murchison bioregion. Climate in the Murchison bioregion is characterised as arid, with winter rainfall in the south. Mean maximum temperatures of the Kalgoorlie-Boulder area range from 33.7°C in January, to 16.9°C in July; mean minimum temperatures range from 18.4°C in January, to 5.1 °C in July (BoM, 2024). Rainfall is irregular but with a relatively even distribution over the year, with mean annual rainfall approximately 265 mm (BoM, 2024). Cyclonic activities in the north of Western Australia can occasionally cause heavy rainfall events and flooding in this area during summer months. Climate data from the Kalgoorlie-Boulder Airport weather station (12038) between 1939 and 2024 (BoM, 2024) is presented in

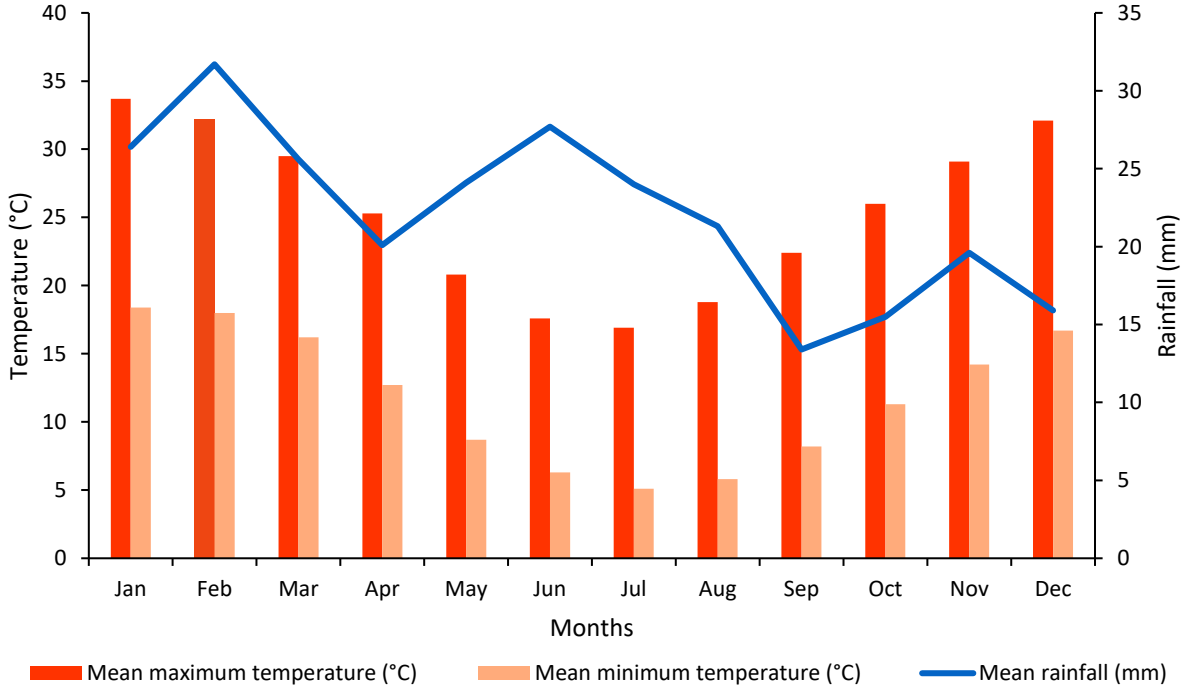

Figure 4 below.

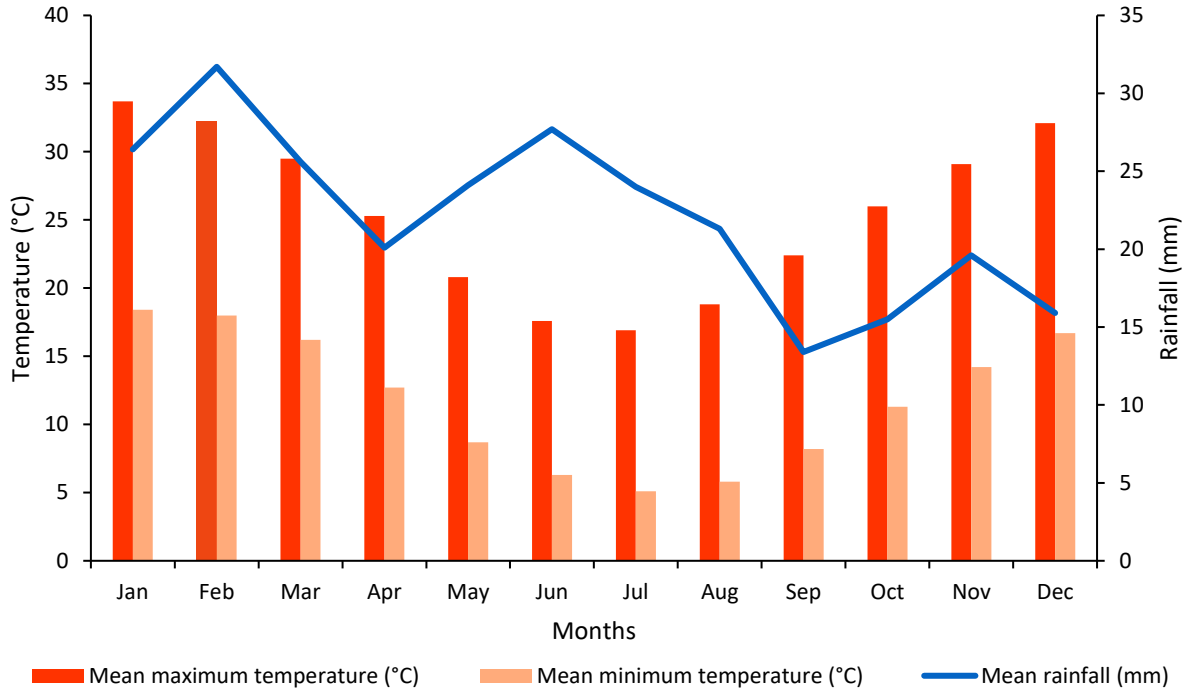

Figure 4: Mean rainfall and climatic data for Kalgoorlie-Boulder

Average long-term annual rainfall is exceeded by average annual evaporation rate (approximately 2,600 mm) by a factor of almost 10 to 1. Evaporation exceeds rainfall in all months of the year, with June having the lowest daily evaporation and January having the highest daily evaporation.

Wind conditions from Kalgoorlie-Boulder airport weather station (#12038) show that morning wind conditions are predominantly easterlies, north-easterlies, and south-easterlies averaging between 12 and 17 km/hr. Afternoon wind direction is variable, and predominantly westerlies, easterlies and south-easterlies averaging between 13 and 18 km / hr.

2.2 Landscape

2.2.1 Bioregion

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (IBRA 2010).

The Project occurs within the Murchison bioregion and Eastern Murchison subregion (MUR01). In close proximity south is the Eastern Goldfields (COO03) sub-region of the Coolgardie bioregion. The Eastern Murchison subregion lies on northern parts of the Yilgarn Craton, within the Kalgoorlie Province soil-landscape (Tille, 2007). Red/brown calcareous loamy earths are the dominant surface soil group. Located on greenstone and granitic rocks, the relief of this province is subdued and comprises of flat to undulating plains with small valleys. Hills, ranges, salt lakes and stony plains occasionally feature in the landscape. Underlying basement geology is of granite, gneiss and greenstone. Geology of the Eastern Murchison bioregion characteristically

features internal drainage, extensive areas of elevated red desert sandplains, broad plains of red-brown soils with breakaways, and paleo-drainage salt lakes. Ephemeral watercourses are present in the landscape and drain south-easterly towards an extensive salt lake system at King of the West Lake. There are no permanent rivers, creeks or lakes within the region.

Vegetation of the Eastern Murchison subregion is characterised by low woodlands of eucalyptus and mulga. Eucalypts dominate towards the south and mulga dominates increasingly towards the north. The study area features mulga woodlands, eucalypts, eremophilas, hummock grasslands, saltbush shrublands and Halosarcia shrublands (Cowan 2001). Diverse eucalyptus woodlands are present in valleys, on ranges and around salt lakes.

2.2.2 Soils

The Project area is within the Latimore and Moriarty land systems as classified by the soil landscapes and land mapping system (DPIRD, 2018). The northern portion of the Project area is within the Moriarty system which features low greenstone rises and stony plains. The southern part of the Project area is within the Latimore land system which involves gravelly plains with gentle undulation and low rises on laterite.

The Project is located within the Kambalda Zone of the Kalgoorlie Province soil-landscape (Tille, 2007). Soils of this Kambalda Zone include calcareous loamy earths and red loamy earths. These soils are in association with salt lakes, red brown hardpan shallow loams and red, sandy duplexes of mallee woodlands and halophytic shrublands. Soils are considered poor and consequently have limited potential for agricultural use.

Previous studies of neighbouring Black Swan Nickel Mine indicated topsoil to be generally non-saline and neutral to acidic in the general area of the Project (Landloch, 2008; Norilsk, 2013). Soils in the area were indicative of kaolinitic clays and low organic carbon, having low cation exchange capacity and low levels of most vital plant nutrients and trace elements. The subsurface profile was recorded as gravely clays to clayey gravels, overlaying a ferricrete hardpan layer, followed by saprolitic clays and then completely weathered felsic rocks (PNL, 2021).

2.3 Biodiversity

2.3.1 Biological Surveys

Native vegetation clearing is required to facilitate development of the Project. To support this, a biological survey has been undertaken in the area, with a summary detailed in Table 2 below. The survey included a field assessment to determine likelihood of significant vegetation, flora and fauna within the Project area. Biodiversity survey area is shown in Figure 5. The biological survey is provided in **Appendix B**. Table 3 lists other known biological surveys that have been completed within, or in proximity to, the study area and may hold relevance.

Table 2: Biological surveys

Survey title	Fieldwork date	Limitations identified	Author / reference
East Samson Dam Project Biological Survey	December 2019	None identified	Onshore Environmental

Table 3: Summary of biological surveys within, or in proximity to, the study area

Report	Survey timing and intensity	Vegetation associations and landform	Taxon summary	Significant flora
Onshore Environmental (1995) Outline for Biological and Environmental Components of a Notice of Intent, M27/39 and M27/200 Leases, Black Swan Nickel Project	9-11 October 1995	10 vegetation associations	108 taxa, 28 families, 49 genera, 2 introduced species	No Threatened or Priority Flora recorded
Onshore Environmental (2004a) Proposed Miscellaneous License Low Salinity Exploration Targets	13 quadrats 29-30 October 2004	5 vegetation associations	97 taxa, 26 families, 50 genera, 1 introduced species	No Threatened or Priority Flora recorded
Onshore Environmental (2004b) Flora and Vegetation Survey – Federal Pit – Black Swan Pipeline Route	38 quadrats 25-26 October 2004	17 vegetation associations	119 taxa, 24 families, 48 genera, 8 introduced species	No Threatened or Priority Flora recorded
Onshore Environmental (2003a) Flora and Vegetation, Leinster – Wiluna Optic Fibre Cable Route	No quadrats 15 – 19 September 2003	20 vegetation associations	188 taxa, 33 families, 73 genera, 4 introduced species	No Threatened Flora. Three Priority Flora[1]: Eremophila pungens (P4), Grevillea inconspicua (P4) and Hemigenia exilis (P4)
Onshore Environmental (2003b) Flora and Vegetation, Meekatharra – Wiluna Optic Fibre Cable Route	No quadrats 8 – 10 February 2003	11 vegetation associations	Total recorded taxa not provided; 3 introduced species	No Threatened Flora One Priority Flora: Micromyrtus mucronulata[2] (P1)

Onshore Environmental (2007) Oakover Gold Ltd Mt Magnet Tenement Targeted Significant Flora Survey	No quadrats 21 – 24 February 2007	Four vegetation associations	Total recorded taxa not provided; no introduced species	No Threatened or Priority Flora recorded
Onshore Environmental (2008a) Proposed Pits at Crusader, 450 South, Zone 2 and New Woman Projects, Flora and Vegetation Survey	73 quadrats 27 March – 3 April 2008	11 vegetation associations	138 taxa, 37 families, 59 genera; 3 introduced species	No Threatened Flora. Two Priority Flora: Hybanthus floribundus subsp. Chloroxanthus (P3) and Eremophila pungens (P4)
Onshore Environmental (2008b) Emu – Vivien Pipeline, Vivien, Vivien Gem, Turret North and Cinderella Projects, Flora and Vegetation Survey	66 quadrats 29 January – 5 February 2008	12 vegetation associations	136 taxa, 31 families, 65 genera, 2 introduced species	No Threatened Flora. Four Priority Flora[3]: Hybanthus floribundus subsp. chloroxanthus (P3), Thryptomene sp. Leinster (B.J. Lepschi & L.A. Craven 4362) (P3), Eremophila pungens (P4) and Grevillea inconspicua (P4)
GHD (2011) Main Roads Western Australia, Report for Goldfields Highway, SLK 737-748 Biological Survey	No quadrats 8 – 11 November 2010	Eight vegetation associations	98 taxa, 24 families, 50 genera, 2 introdices species	No Threatened or Priority Flora recorded
AECOM Australia (2014) Square Kilometre Array Ecological Assessment	65 quadrats September 2014	15 vegetation associations	199 taxa, 36 families, 82 genera, 4 introduced species	No Threatened Flora Six Priority Flora: Gunniopsis divisa (P3), Hemigenia tysonii (P3), Ptilotus beardie (P3), Sauropus sp. Woolgorong (M. Officer s.n. 10/8/94) (P3), Verticordia jamiesonii (P3) and Frankenia confuse (P4); additional Eremophila simulans subsp. megacalyx (P3) was previously recorded in the area
GHD (2016) Main Roads Western Australia, Goldfield Highway Material Sources SLK 748 to 781 Biological Survey	20 quadrats 9 – 12 November 2015	Nine vegetation associations	114 taxa, 24 families, 55 genera, 1 introduced species	No Threatened or Priority Flora recorded

[1] *Baeckea* sp. Melita Station (H. Pringle 2738), *Calytrix erosipetala* and *Calytrix uncinate* were recorded as P3 species, and *Acacia balsamea* as a P4 species at the time of the survey, but are no longer listed as a Priority species

[2] Recorded as *Micromyrtus racemosa* var. *mucronata* at the time of the survey

[3] *Baeckea* sp. Melita Station (H. Pringle 2738) and *Calytrix erosipetala* were recorded as P3 species at the time of the survey, but are no longer listed as a Priority species

2.3.2 Vegetation

The Project is located within the Austin Botanical District. This region is within the Eastern Murchison subregion of the Murchison bioregion according to the Interim Biogeographic Regionalisation of Australia (IBRA) (DBCA 2003). This bioregion is located within the Eremaean Province (Beard 1990). This area is comprised primarily of low woodlands dominated by Eucalyptus, Acacia and Eremophila species. *Acacia aneura* (commonly known as mulga) is primarily dominant in the area, characteristic of the Austin Botanical District (McKenzie and Hall 1992). Ephemeral species such as Asteraceae (daisies) and Poaceae (grasses) are also found.

Pre-European vegetation association dataset (DPIRD, 2019) indicates that the Project area is located within one vegetation association. Areas retaining less than 30% of their pre-European vegetation extent generally experience exponentially accelerated species loss, while areas with less than 10% are considered "endangered" (EPA, 2000). The vegetation association within the disturbance envelope is Barlee 20 and it retains > 99% of the pre-European extent (Beard et al 2013). Therefore, development within the disturbance envelope will not significantly reduce the extent of pre-European vegetation associations or increase risk of loss.

Vegetation association description is detailed in Table 4 below and shown in Figure 6.

Table 4: Pre-European vegetation associations

Vegetation association	Structural description	Floristic description	Extent remaining (%)
Barlee 20	Woodland	Low woodland; mulga mixed with Allocasuarina cristata and Eucalyptus sp.	99.8

2.3.2.1 Vegetation Communities

Vegetation assessments were undertaken via establishment of strategically placed quadrats to ensure all distinct vegetation communities were characterised. Twelve vegetation communities were mapped within the Onshore Environmental (2019) survey. Vegetation communities within the Project area are described in Table 5 below.

Table 5: Vegetation communities

Survey Area	Name	Landscape position	Community description
Onshore Environmental (2019)	HCSafDlAkDlSsWrCp	Hill crests	Low Scrub A of *Senna artemisioides* subsp. *filifolia, Dodonaea lobulata* and *Acacia kalgoorliensis* over Dwarf Scrub C of *Dodonaea lobulata, Scaevola spinescens* and *Westringia rigida* with Open Low Woodland A of *Casuarina pauper* over Open Scrub of *Acacia duriuscula, Acacia burkittii* and *Santalum spicatum* on orange sandy loams on hill crests, upper hill slopes and low stony rises
	SPAdAbAtElCp	Stony plains	Scrub of *Acacia duriuscula, Acacia burkittii* and *Acacia tetragonophylla* with Very Open Tree Mallee of *Eucalyptus longissima* over Open Low Woodland A of *Casuarina pauper* over Open Low Scrub A of *Scaevola spinescens, Dodonaea lobulata* and *Senna artemisioides* subsp. *filifolia* on orange silty loam on stony plains
	SPAdDlSafCpAdAmAt	Stony plains	Low Scrub A of *Acacia duriuscula, Dodonaea lobulata* and *Senna artemisioides* subsp. *filifolia* with Open Low Woodland A of *Casuarina pauper* over Open Scrub of *Acacia duriuscula, Acacia ?incurvaneura x mulganeura* and *Acacia tetragonophylla* over Open Dwarf Scrub C of *Scaevola spinescens, Ptilotus obovatus* and *Eremophila granitica* on red silty loam on stony plains
	SPAiAdAmcCpSafSsAh	Stony plains	Scrub of *Acacia incurvaneura, Acacia duriuscula* and *Acacia ?incurvaneura x mulganeura* with Open Low Woodland A of *Casuarina pauper* over Open Low Scrub A of *Senna artemisioides* subsp. *filifolia, Scaevola spinescens* and *Acacia hemiteles* over Open Dwarf Scrub C of *Dodonaea lobulata, Scaevola spinescens* and *Ptilotus obovatus* on brown silty loams on stony plains
	SPElEcCpAdAbAiE	Stony plains	Open Tree Mallee of *Eucalyptus longissima* and *Eucalyptus concinna* over Open Low Woodland A of *Casuarina pauper* over Open Scrub of *Acacia duriuscula, Acacia burkittii* and *Acacia incurvaneura* over Open Low Scrub A of *Senna artemisioides* subsp. *filifolia, Eremophila granitica* and *Dodonaea lobulata* over Open Dwarf Scrub D of *Ptilotus obovatus* on brown silty loam on stony plains
	SPEsEtEsSafSsE	Stony plains	Woodland of *Eucalyptus salmonophloia* (with *Eucalyptus transcontinentalis)* over Open Scrub of *Eremophila scoparia* over Open Low Scrub A of *Senna artemisioides* subsp. *filifolia* and *Senna stowardii* over Open Dwarf Scrub D of *Sclerolaena diacantha, Maireana triptera* and *Maireana tomentosa* on red brown silty clay loam on stony plains
	SPEtElCpSafEs	Stony plains	Open Woodland of *Eucalyptus transcontinentalis* and *Eucalyptus lesouefii* over Open Low Woodland A of *Casuarina pauper* over Open Low Scrub A of *Senna artemisioides* subsp. *filifolia* and *Eremophila scoparia* over Open Dwarf Scrub D of *Eremophila parvifolia* subsp. *auricampa, Ptilotus obovatus* and *Maireana trichoptera* on red sandy clay loam on stony plains
	HPAmAmgccGnAbAdAtSafPs	Hardpan plains	Thicket of *Acacia mulganeura, Acacia ?incurvaneura x mulganeura* and *Grevillea nematophylla* subsp. *nematophylla* over Scrub of *Acacia burkittii, Acacia duriuscula* and *Acacia tetragonophylla* over Open Low Scrub A of *Senna artemisioides* subsp. *filifolia* and *Psydrax suaveolens* on red sandy clay loam on hardpan plains

Survey Area	Name	Landscape position	Community description
	HPEsEcElSafErgbAhEiEs	Hardpan plains	Open Tree Mallee of *Eucalyptus salubris*, *Eucalyptus concinna* and *Eucalyptus lesouefii* over Low Scrub A of *Senna artemisioides* subsp. *filifolia, Eremophila pantonii* and *Acacia hemiteles* with Open Scrub of *Eremophila interstans* subsp. *interstans* and *Eremophila scoparia* over Open Dwarf Scrub D of *Atriplex vesicaria, Sclerolaena diacantha* and *Maireana trichoptera* on brown silty clay loam on hardpan plains
	FPElEcAmgcAdAiSafSaaDl	Floodplains	Open Tree Mallee of *Eucalyptus longissima* and *Eucalyptus concinna* over Scrub of *Acacia ?incurvaneura* x *mulganeura*, *Acacia duriuscula* and *Acacia incurvaneura* over Open Low Scrub A of *Senna artemisioides* subsp. *filifolia, Senna artemisioides* subsp. x *artemisioides* and *Dodonaea lobulata* over Open Dwarf Scrub D of *Ptilotus obovatus* on red sandy clay loams on floodplains
	FPEsEcAbAaAtSafAh	Floodplains	Tree Mallee of *Eucalyptus salubris* and *Eucalyptus concinna* over Thicket of *Acacia burkittii, Acacia aptaneura* and *Acacia tetragonophylla* over Open Low Scrub A of *Senna artemisioides* subsp. *filifolia* and *Acacia hemiteles* on red sandy clay loam on floodplains
	GPEsEsAvMpEmb	Gillgai plains	Low Woodland A of *Eucalyptus salubris* over Low Scrub A of *Eremophila scoparia* over Open Dwarf Scrub C of *Atriplex vesicaria, Maireana pyramidata* and *Eremophila maculata* subsp. *brevifolia* over Open Dwarf Scrub D of *Sclerolaena diacantha*, *Maireana trichoptera* and *Enchylaena tomentosa* var. *tomentosa* on red silty clay loam on gillgai plains

2.3.2.2 Vegetation Condition

Some areas within the Project area have been subjected to disturbances, including mine exploration, sandalwood cutting, and historical grazing by sheep. However, vegetation condition within the survey area was predominantly rated Excellent or Very Good (97% of the survey area) with only 3% of the survey area rated as Good. Ratings were assessed according to the scale given in Keighery (1994).

Table 6 presents the vegetation condition ratings per area within the MMS clearing envelope area boundary only, as vegetation outside of the boundary will not be affected.

Vegetation condition is shown below in Figure 7.

Table 6: Vegetation condition

Survey Area	Vegetation Condition	Area (ha)	% of total
Onshore Environmental (2019)	Excellent	89.45	48.5
	Very Good	88.95	48.3
	Good	5.92	3.2
	Total	**184.32**	**100**

**Numbers have been rounded to two decimal places for simplicity of data*

2.3.2.3 Significant vegetation

Desktop searches identified no threatened or priority ecological community (T/PECs) within 25 km of the Project area.

The project area is not located within any listed Environmentally Sensitive Area (ESA). The nearest ESA is Goongarrie National Park, which is located approximately 27 km north of the survey area. Another ESA, Rowles Lagoon Conservation Park, is located approximately 66 km west of the survey area.

The project area is not located within any listed conservation areas. The nearest conservation area is Bullock Holes Timber Reserve, which is situated approximately 16 km south-east of the Project. Several other conservation areas exist near Kalgoorlie-Boulder, over 42 km from the Project area.

Nearby ESAs are shown below in Figure 8.

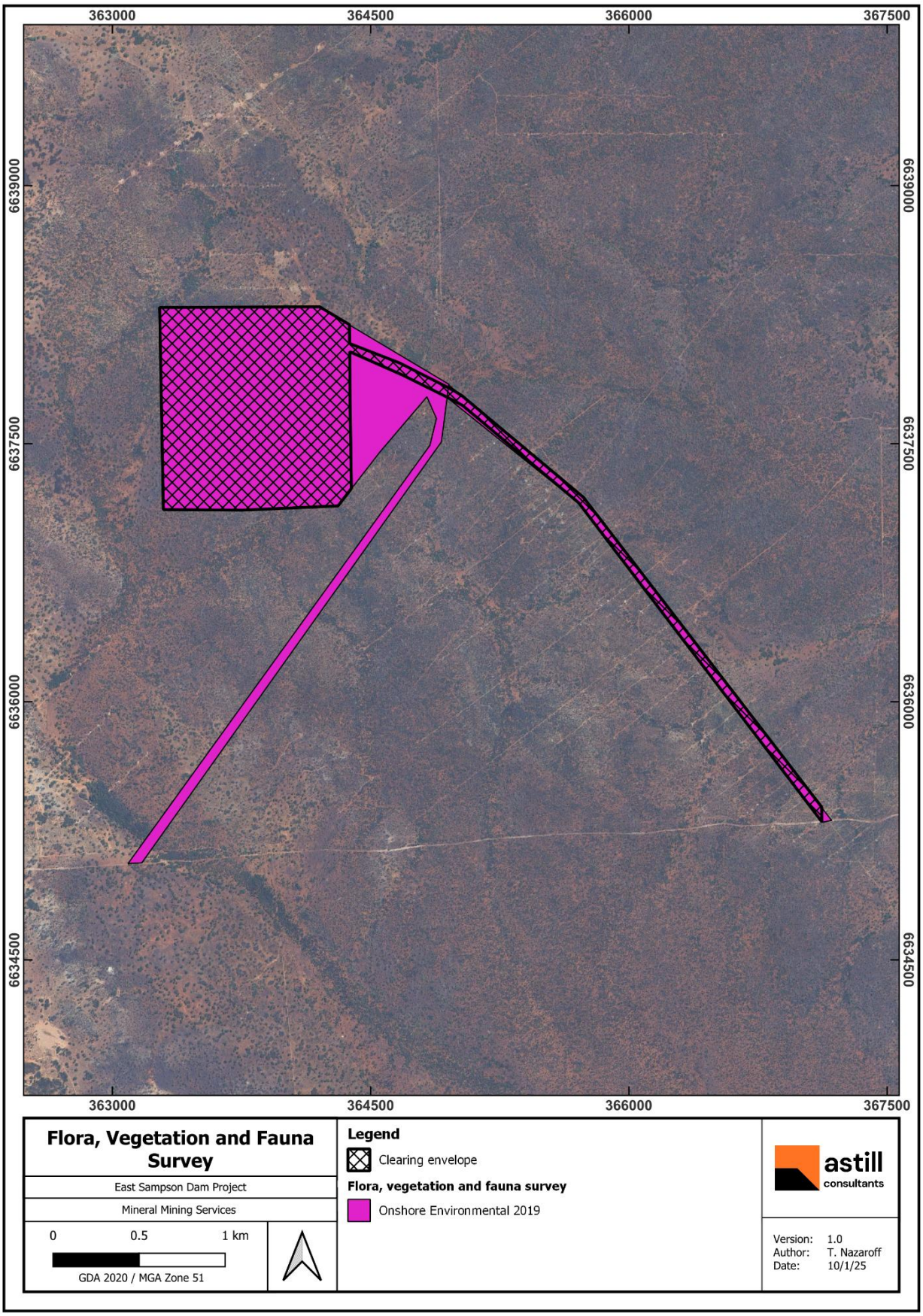

Figure 5. Flora, vegetation & fauna survey area

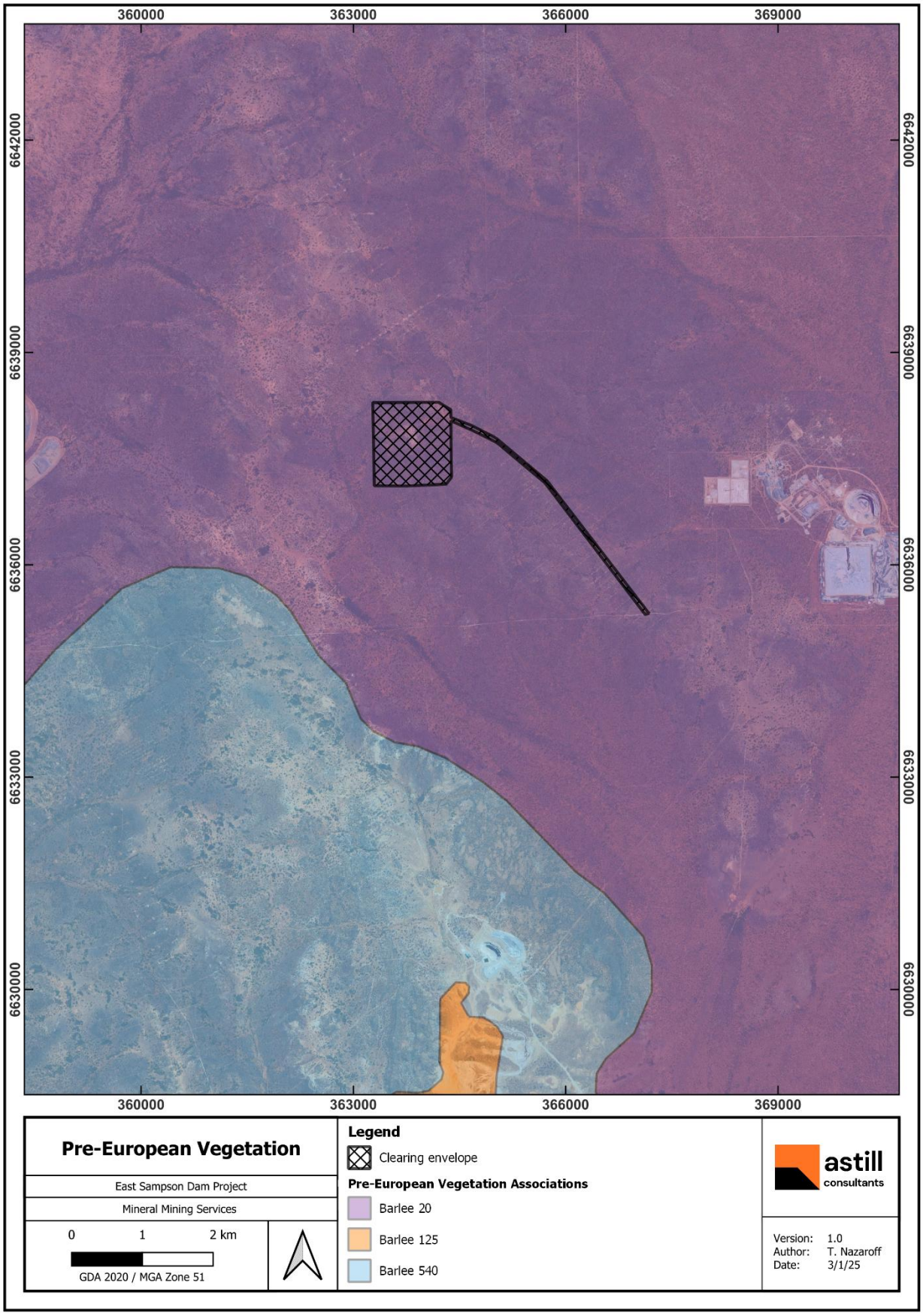

Figure 6: Pre-European vegetation associations

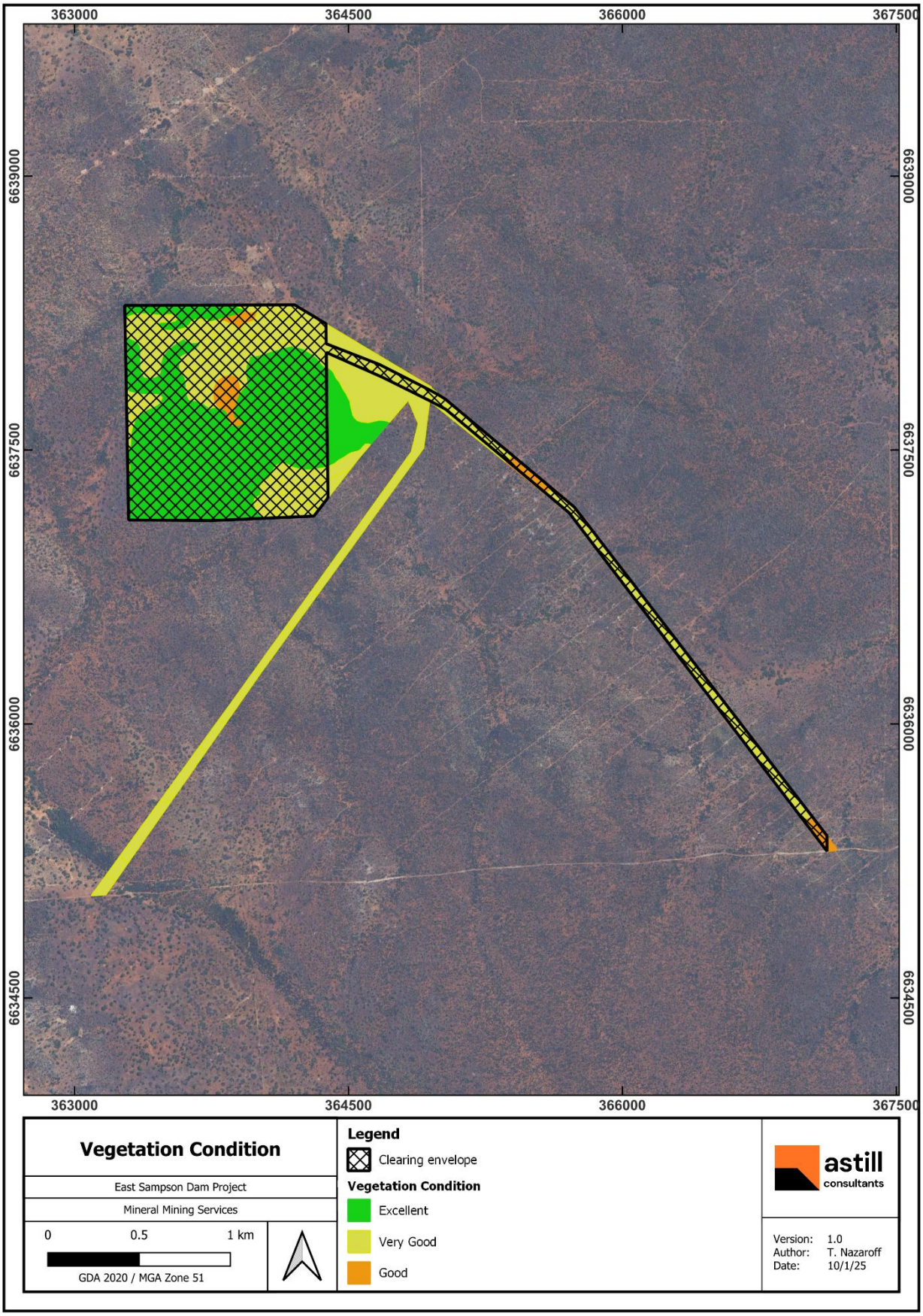

Figure 7: Vegetation condition

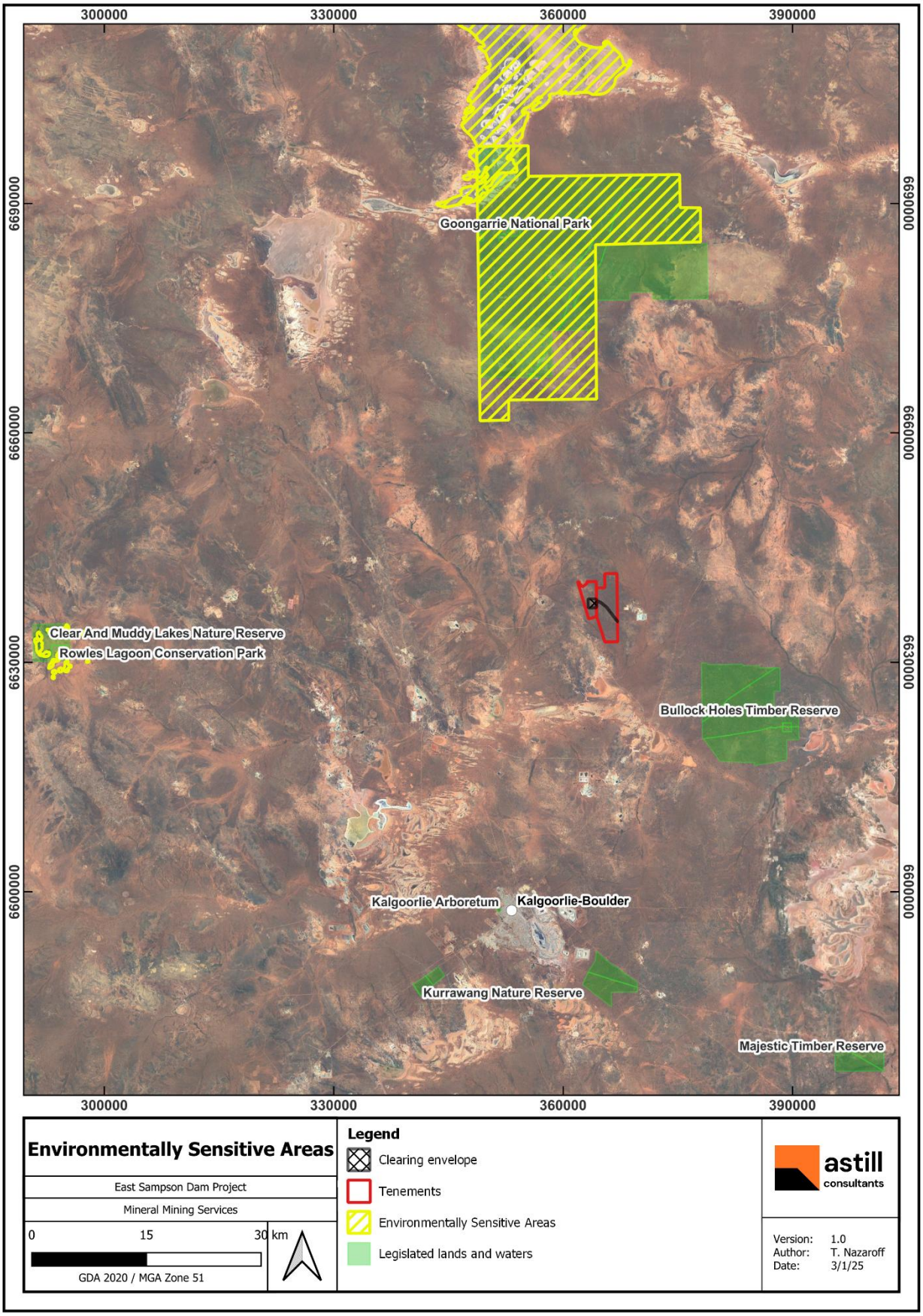

Figure 8: Environmentally sensitive areas

2.3.3 Flora

Onshore Environmental (2019) undertook a detailed flora and vegetation survey for the Project area. The survey found that the dominant families included *Chenopodiaceae* (22 taxa) and *Fabaceae* (19 taxa). The most dominant genera were *Eremophila* (14 taxa) and *Acacia* (13 taxa).

The suite of flora taxa recorded during the survey is considered typical for the area (Beard 1990). A summary of the flora survey is presented in Table 7 below.

Table 7: Flora abundance

Survey	Species number (field search)			
	Total	Genera	Families	Dominant families
Onshore Environmental (2019)	104	44	23	*Chenopodiaceae* (22 taxa) *Fabaceae* (19 taxa) *Scrophulariaceae* (14 taxa)

2.3.3.1 Threatened and Priority Flora

Based on database searches, a total of 18 flora species of conservation significance had possibility of occurring within 50 km of the Project area, comprising of eight Priority 1, two Priority 2, five Priority 3, and three Priority 4 species (Onshore Environmental, 2019).

No Threatened (Declared Rare) or Priority Flora or Ecological Communities (TECs or PECs) were recorded during field surveys of the Project area.

No Priority taxon was recorded within the survey area.

2.3.3.1 Introduced Flora

No introduced flora species were recorded in the Onshore Environmental (2019) survey of the East Sampson Dam project area.

2.3.4 Fauna

A Level 1 vertebrate fauna survey was conducted by Onshore Environmental in 2019. The fauna survey demonstrated that most fauna identified during field observations are common and widespread, with fauna abundance by taxa summarised in Table 8 below.

Table 8: Fauna abundance

Survey	Species number (field search)				
	Total	Amphibians	Birds	Mammals	Reptiles
Onshore Environmental (2019)	67	0	45	3	19

2.3.4.1 Fauna habitat

Three broad fauna habitats have been mapped in the Project area and described in the biological survey. These fauna habitats are considered relatively common and representative of the local area and are widespread through the region. Fauna habitats with example images are summarised in Table 9 below.

Table 9: Fauna habitats

Survey	Habitat type	Description	Example image
Onshore Environmental (2019)	Mallee Woodland	Mallee Woodland habitat is relatively common within the study area and is characterised by species of mallee forming vegetation comprised of *Eucalyptus salubris, E. concinna,* and *E. lesouefii* over shrublands. As these mallee trees are relatively small in diameter, this habitat generally lacks tree hollows. The understorey can be dense and provides suitable habitats for numerous species, including conservation significant Malleefowl (*Leipoa ocellata*).	
	Open Woodland	Open Woodland habitat is less common than mallee-dominated areas. This habitat is predominantly located on the northeastern edge of the study area and is characterised by *Eucalyptus salmonophloia, E. transcontinentalis* and *E. lesouefii* species. Open Woodland habitat has potential to provide microhabitats like tree hollows and logs, which can be suitable for species like the Chuditch (*Dasyurus geoffroii*) and Western Spiney-tailed Skink (*Egernia stokesii badia).* However, the Open Woodland habitat within this study area had a very open understorey and few suitable hollows were detected.	

Survey	Habitat type	Description	Example image
	Shrubland	The Shrubland habitat is the most widespread habitat, occurring throughout most of the study area. This habitat is characterised by species of Acacia including *A. mulganeura* and *A. duriuscula,* as well as *Dodonaea* species. This habitat lacks larger trees and mallee, but the dense structure of the vegetation provides shelter and nesting habitat for ground dwelling birds, including Malleefowl *(Leipoa ocellata).*	

2.3.4.2 Significant fauna

Based on combined desktop and field survey, an assessment was carried out on likelihood of significant fauna species occurring in the Project area. Malleefowl (*Leipoa ocellata*), listed as a Scheduled species under the *Biodiversity Conservation Act 2016* (BC Act) and listed as Vulnerable under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act), was recorded during this survey. A recently active Malleefowl nest mound was identified, and although it was not currently in use, it had clear structure and indication of being used in recent breeding seasons. A second species also listed under the BC Act, Peregrine Falcon (*Falco peregrinus*), was identified as having the potential to utilise the study area for foraging but suitable breeding habitat for the species was not present.

It should be noted that while habitats onsite are considered possibly suitable, some or all may be marginal in extent/quality and therefore fauna species considered as possibly occurring may in fact only visit the area for short periods as infrequent vagrants. A summary of significant fauna likelihood is detailed in Table 10 below.

Table 10: Significant fauna likelihood

Species name	Common name	Conservation status		Assessment	Likelihood
		EPBC Act	BC Act		
Mammals					
Myrmecobius fasciatus	Numbat, Walpurti	EN	EN	Suitable habitat present, unburned eucalyptus woodland and forests. No records within 50 km radius.	Low
Macrotis lagotis	Bilby, Dalgyte	VU	VU	No suitable habitat present.	Low
Dasyurus geoffroii	Chuditch, Western Quoll	VU	VU	Traditionally occupied a wide range of habitat, but today survives in Eucalyptus forest. There is suitable habitat present. No records within 50 km radius.	Low
Reptiles					
Egernia stokesii badia	Western Spiney-tailed Skink	EN	VU	Suitable habitat of York gum and Salmon Gum woodland with an abundance of hollow logs is present. No records within 50 km radius.	Low
Aspidites ramsayi	Woma	N/A	N/A	Known to occur on sandplains which is not present in survey area.	Low
Birds					
Leipoa ocellata	Malleefowl	VU	VU	Preferred habitat of scrubland and woodland dominated by mallee and wattle species is present. Evidence of Malleefowl recorded in the study area (Onshore Environmental, 2019). Survey found a single malleefowl nest mound of recent use.	Recorded
Falco peregrinus	Peregrine Falcon	N/A	Other	The peregrine falcon is widespread, highly mobile and known to have a very large range. However, it prefers cliffs or woodlands with water and so the study area is not ideal habitat but may be suitable habitat transiently when foraging for food.	Medium
Calyptorhynchus latirostris	Carnaby's Cockatoo	EN	N/A	Suitable habitat is not present. Prefers woodland dominated by large trees and heathland.	Low
Charadrius veredus	Oriental Plover	MI	MI	Suitable habitat is not present. Prefers open grasslands.	Low
Oxyura australis	Blue-billed Duck	N/A	N/A	Suitable habitat is not present. Prefers lakes and wetlands.	Low
Thinornis rubricollis	Hooded Plover (Hooded Dotterel)	MA	N/A	Suitable habitat is not present. Prefers lakes and wetlands.	Low
Falsistrellus mackenziei	Western False Pipistrelle	N/A	N/A	Suitable habitat is not present. Prefers old growth forest dominated by wet scherophyll forest.	Low
Arenaria interpres	Ruddy Turnstone	MI	N/A	Suitable habitat is not present. Prefers lakes and wetlands.	Low

Species name	Common name	Conservation status		Assessment	Likelihood
		EPBC Act	BC Act		
Actitis hypoleucos	Common Sandpiper	MI, MA	MI	Suitable habitat is not present. Prefers lakes and wetlands.	Low
Calidris acuminata	Sharp-tailed Sandpiper	MI, MA	MI	Suitable habitat is not present. Prefers lakes and wetlands.	Low
Calidris alba	Sanderling	MI, MA	N/A	Suitable habitat is not present. Prefers lakes and wetlands.	Low
Calidris ferruginea	Curlew Sandpiper	CR, MI, MA	CR, IA	Suitable habitat is not present. Prefers intertidal mudflats and ephemeral and permanent lakes	Low
Amytornis textilis textilis	Western Grasswren	MI, MA	N/A	Suitable habitat is not present. Prefers semi-arid shrublands on dunes, plains and drainage.	Low
Calidris ruficollis	Red-necked Stint	MI, MA	MI	Suitable habitat is not present. Prefers lakes and wetlands.	Low
Tringa brevipes	Grey-tailed Tattler	MI, MA	MI	Suitable habitat is not present. Prefers lakes and wetlands.	Low
Tringa glareola	Wood Sandpiper	MI, MA	MI	Suitable habitat is not present. Prefers lakes and wetlands.	Low
Tringa nebularia	Common Greenshank	MI, MA	MI	Suitable habitat is not present. Prefers intertidal mudflats and ephemeral and permanent lakes	Low
Plegadis falcinellus	Glossy Ibis	MI, MA	MI	Suitable habitat is not present. Prefers lakes and wetlands.	Low

*Conservation Status: State – Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation List, Federal – Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR – Critically Endangered, EN – Endangered, VU – Vulnerable, IA/MI – Migratory, MA – Marine, P – Listed as Priority by DBCA, Other – Other specially protected species under Biodiversity Conservation Act 2016.

2.3.4.3 Short Range Endemics

Habitat types in the Project area are regionally common and with a high degree of habitat connectivity, and therefore it is unlikely that any short-range endemic (SRE) species is restricted to the Project area.

2.3.4.4 Subterranean fauna

Previous assessments of the nearby Black Swan Nickel Mine and Golden Cities – Mulgarrie Mine have concluded that the presence of subterranean fauna (stygofauna and troglofauna) is extremely unlikely (Norton Gold Fields Limited, 2020; PNL, 2021). This conclusion was based on the lack of suitable geological habitat for subterranean fauna in the region.

2.3.4.5 Introduced fauna

No introduced fauna species were observed within the study area during the Onshore Environmental (2019) survey.

2.4 Hydrology

A minor surface water resource known as East Sampson Dam is located within the Project area, purposed for pastoralism. The dam is located downstream of a minor, ephemeral watercourse which flows west to east. MMS is in negotiations with the pastoralist to ensure any impact to the dam is managed appropriately.

Another minor, ephemeral watercourse flows north to south approximately 500 m east of the Project before flowing south-east away from the Project area. There are a few local-scale, ephemeral drainage lines in the region surrounding the Project. In general, surface water in the area is insignificant and only present ephemerally, characteristic of the arid climate.

The Project is within the Raeside-Ponton catchment, which is part of the Salt Lake Basin of the Western Plateau division. Surface water in the area predominantly drains into a series of salt lakes and claypans situated over 7 km south-south-west of the Project area (BHP Gold, 1990).

Clearing within watercourses is likely to have minor impacts due to the nature of ephemeral drainage lines. Drainage diversion infrastructure will be installed where necessary to ensure that flood risks to the Project at a local scale are mitigated whilst preserving natural flow paths.

Regional surface hydrology drainage is shown below in Figure 9.

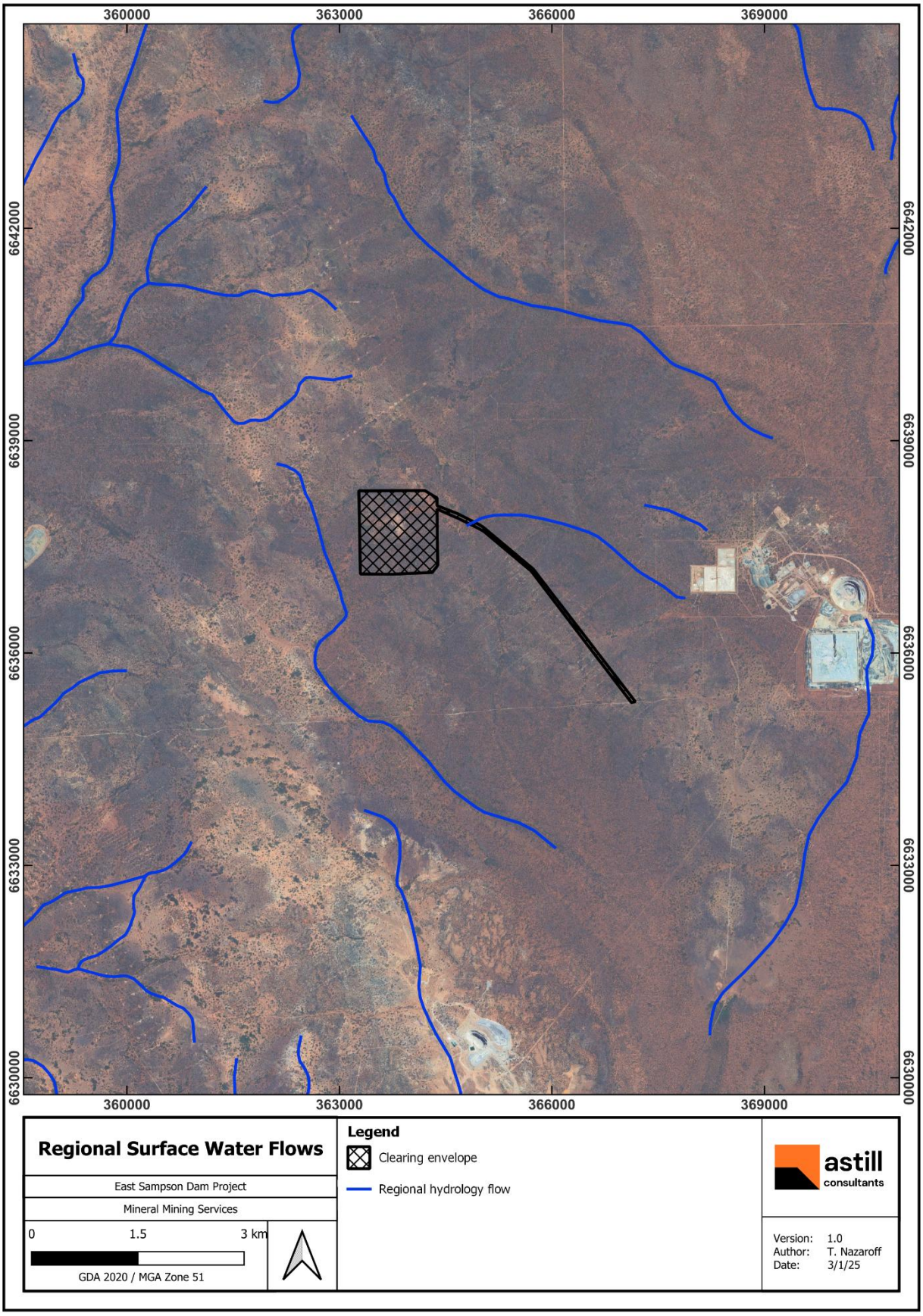

Figure 9: Regional surface water hydrology

2.5 Hydrogeology

Fractured bedrock aquifers are characteristic of the Eastern Murchison subregion, with groundwater predominantly residing in weathered rock zones in proximity to the fresh rock interface, and within ancient alluvial paleochannel aquifer complexes as part of salt lake systems. Groundwater is primarily replenished by infrequent, high intensity rainfall events, with water entering aquifers directly via salt lake basins and gravitationally via basement rock fractures (Kern, 1995).

Groundwater in the area has total dissolved salts (TDS) ranges between 20,000 to 50,000 mg/L at shallow depths, which increases to approximately 130,000 mg/L at mineralised zone depth. These TDS levels are considered hypersaline and as such, groundwater has limited use outside of mining. As a result, negligible hydrogeological impacts are anticipated to occur from clearing activities.

2.6 Heritage

2.6.1 Native Title

There is no Native Title Determination across the Project area.

There are two registered Native Title claims over the Project area, Kakarra Part A Claim (WC2020/005) and the Maduwongga Claim (WC2017/001). The Maduwongga Claim was dismissed in the Federal Court in April 2023.

2.6.2 Aboriginal Heritage

A search of Department of Planning Lands and Heritage (DPLH) Aboriginal Cultural Heritage Inquiry System (ACHIS) in December 2024 identified no registered or lodged Aboriginal sites within the Project area.

A lodged Aboriginal site (ID 22607) exists approximately 2 km north of the Project area, at the M27/263 tenement boundary, and another (ID 21975) exists approximately 1.7 km south of the Project, at the E27/528-I tenement boundary. As these sites are outside the Project area, the proposed clearing and mining activities will not interact with any Aboriginal Heritage Sites. The nearby DPLH Lodged Aboriginal sites are shown in Figure 10.

Three on-ground Aboriginal heritage surveys were undertaken with local knowledge holders in the Project area in 2018 and 2019. Surveys confirmed no sites of cultural or archaeological significance within the Project area (Mathieu, 2018; Mathieu, 2018; Mathieu, 2019).

Aboriginal heritage surveys carried out in the Project area are confidential and available upon request. Aboriginal heritage surveys are summarised in Table 11.

Table 11. Aboriginal Heritage Surveys undertaken in the Project area

Year	Company	Report	Survey Type	Representatives	Comment
November 2019	Dr Christine Mathieu	Heritage Survey at Samson Dam Project Near Kanowna, WA	Archaeological and ethnographic	Joyce Nudding, Marjorie Strickland, Pamela Stokes, Jacqueline Spurling, Desley Nudding, Teresa Stokes, Brendon Spurling, Adam Graham	Confirmed no sites of cultural or archaeological significance
April 2018	Dr Christine Mathieu	Heritage Survey at the Silver Swan North Project Near Kanowna	Archaeological and ethnographic	Jacqueline Spurling, Pamela Stokes, Brendon Spurling, Teresa Stokes	Confirmed no sites of cultural or archaeological significance
November 2018	Dr Christine Mathieu	Heritage Survey at the Silver Swan North Project Near Kanowna	Archaeological and ethnographic	Jacqueline Spurling, Pamela Stokes, Brendon Spurling, Teresa Stokes	Confirmed no sites of cultural or archaeological significance

2.6.3 European Heritage

A search of State Heritage Office inHerit database in December 2024 showed no Statutory Heritage Listings in the vicinity of the Project.

The nearest Statutory Heritage Listing, the Royal Flying Doctor Service Base (Place number: 7534) is located approximately 40 km south-west of the Project area, in Kalgoorlie-Boulder. Accordingly, no European heritage sites will be impacted by the proposed clearing and mining activities.

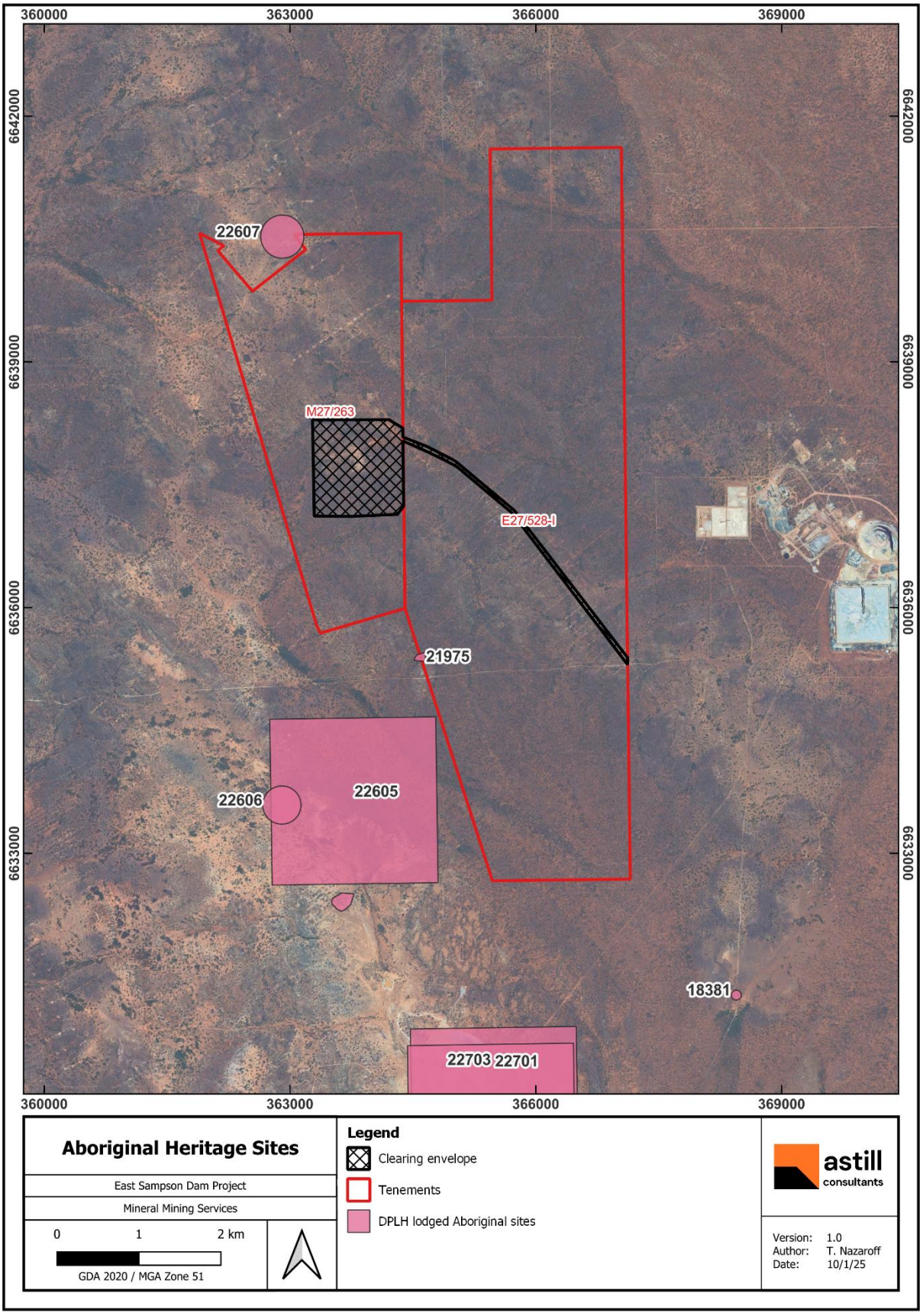

Figure 10: Aboriginal heritage sites

3. Assessment Against Clearing Principles

An assessment against each of the ten clearing principles as defined under Schedule 5 of the *EP Act* demonstrates that the proposed clearing is unlikely to be at variance with any of principles as outlined in Table 12 below.

Table 12: Clearing principles assessment

Clearing principle	Assessment	Outcome
a) Native vegetation should not be cleared if it comprises a high level of biological diversity.	The Eastern Murchison subregion is rich and diverse in its flora; however, most species (excluding Priority species) are wide ranging and usually occur in at least one, and often several, adjoining subregions (Cowan, 2001). The Project area is not considered to comprise a high level of biological diversity as vegetation is typical of the surrounding region. The vegetation within the Project area has been impacted by historical and recent disturbances, reducing vegetation quality.	Unlikely to be at variance to this principle.
b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.	Conservation significant species considered to be potentially present in the area include Malleefowl. One nest mound of recent use was identified within the Project area but no further evidence of Malleefowl present was recorded. Malleefowl have a wide range, and habitat present is analogous to the surrounding area and is not considered to be significant for this species. The peregrine falcon may potentially be present in the area. The study area is not suitable breeding habitat for the species but may be suitable for food foraging as the species is widespread, highly mobile and known to have a very large range. However, as the habitat present is analogous to the surrounding area and considering the capable range of the peregrine falcon, the area is not considered to be significant for this species.	Unlikely to be at variance to this principle.
c) Native vegetation should not be cleared if it includes or is necessary for the continued existence of rare flora.	No Threatened (Declared Rare) or Priority flora species were recorded in the Project area during the vegetation and flora survey. No threatened flora species recorded in any historical surveys in the general area of the Project.	Unlikely to be at variance to this principle
d) Native vegetation should not be cleared if it comprises the whole or a part of or is necessary for the maintenance of a threatened ecological community.	There are no known TECs located within a 50 km radius of the Project area. There is one PEC, Emu Land System (Priority 3iii), located approximately 20 km north of the survey area. No vegetation analogous to TECs or PECs were recorded in the vegetation and flora survey.	Not at variance to this principle
e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared	The Project area includes pre-European vegetation association Barlee 20 with remaining extents of 99.78% remaining across the Murchison Bioregion. The clearing represents a minor portion of vegetation in an area well connected to surrounding vegetation.	Not at variance to this principle

f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	There are no permanent watercourses or wetlands in the Project area. Minor ephemeral surface water flow paths exist near the Project area and one path flows from the boundary of the Project area away to the east. However, vegetation associated with these flow paths are not specific to these areas and are not considered riparian vegetation.	Unlikely to be at variance to this principle
g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	The disturbance envelope contains some exploration disturbance, and following completion of the Project activities will be rehabilitated in accordance with an approved Mine Closure Plan.	Unlikely to be at variance to this principle
h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	There are no conservation areas or DBCA-managed lands in the Project area. The nearest ESA is Goongarrie National Park, which is located approximately 27 km north of the survey area. The nearest conservation area is Bullock Holes Timber Reserve, which is situated approximately 16 km south-east of the survey area.	Not at variance to this principle.
i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	The only permanent surface water feature in the Project area is the East Sampson Dam which is a minor water body used for pastoralism. Groundwater in the region is hypersaline and has limited uses outside of the mining industry. Groundwater recharge is slow and will not be impacted by clearing activities.	Unlikely to be at variance to this principle
j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.	The climate is arid with an average annual rainfall under 300 mm. There are no permanent rivers, lakes or creeks in the region and watercourses are ephemeral and minor. Ephemeral drainage lines in the Project area are likely to only flow as shallow overland flow. Average annual evaporation exceeds average annual rainfall by a factor of almost 10 to 1. Drainage diversion infrastructure will be installed to ensure that flood risks to the Project are mitigated whilst preserving natural surface water flow paths.	Unlikely to be at variance to this principle

4. Clearing Process

Vegetation will be cleared by mechanical clearing. Clearing areas will be kept to the minimum area required for mine activities and undertaken progressively as required. Existing disturbances will be utilised where possible.

4.1 Equipment

Equipment required to undertake and support clearing activities may include a combination of:

- Dozer;
- Loader;
- Excavator;
- Water Cart; and
- Service Vehicles.

4.2 Methodology

Prior to any clearing, a surface disturbance permit will be authorised by MMS to ensure clearing is able to be undertaken under a clearing permit or valid clearing exemption (i.e., Regulation 20 of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*).

Proposed clearing will be demarcated by a surveyor using high visibility tape / survey pegs to ensure clear visual boundaries for operators prior to clearing commencement. A toolbox meeting will be held between the supervisor and clearing operator to ensure awareness of clearing areas and any areas to be avoided.

Where practicable, raised blade clearing will be used. Where this is not practicable, topsoil will be stripped to 200 mm depth and stockpiled for use in rehabilitation, along with removed vegetation. Once clearing has been completed, surveyors will complete a pickup of cleared areas and provide the data to the environmental department for their records and external reporting obligations.

4.3 Rehabilitation

Rehabilitation of cleared areas will occur in accordance with the Mine Closure Plan (MCP) which will be created for the East Sampson Dam Project and will be submitted in conjunction with a Mining Proposal to DEMIRS in tandem with this application.

5. Environmental Management

MMS maintains an Environmental Management System (EMS) which includes management strategies and procedures for key environmental areas including those related to clearing activities (i.e., air quality, fauna, land and soils, vegetation, and weeds). Applicable management measures are summarised below.

5.1 Air quality

Dust is generated from clearing activities, topsoil stripping and spreading. Excessive dust can increase local particulate levels, impacting surrounding vegetation and sensitive receptors.

The following management measures will be implemented to mitigate air quality impacts:

- Weather conditions are monitored, and dust impacts are assessed during clearing;
- Topsoil stripping and spreading activities will be restricted if dust cannot be adequately controlled during periods of high winds; and
- Water carts are available and utilised for wetting down of soils as required.

5.2 Land and soils

Land and soils may be impacted by clearing activities including minor hydrocarbon spills and poor topsoil stripping and handling practises. These impacts may have long term effects on rehabilitation performance.

The following management measures will be implemented to conserve land and soil resources:

- Regular inspections and maintenance of machinery including daily pre-starts;
- Spill kits closely available during clearing activities;
- Stripping topsoil to a maximum depth of up to 200 mm;
- Topsoil stripping to be undertaken as close as possible to commencement of activities; and
- Soils to be paddock-dumped into stockpiles of no greater than 2 m in height and have adequate distance between them to create a series of mounds and troughs.

5.3 Fauna

Fauna impacts (vehicle strike) during clearing activities may result in injury or death of native fauna or livestock. Whilst not all incidents are avoidable, impacts can be minimised.

The following management measures will be implemented to reduce the risk to fauna:

- Speed limits will be signed and enforced;
- Any injury or death of fauna will be recorded and investigated;
- Access to food wastes will be minimised by ensuring effective storage and disposal; and
- Personnel are prohibited from direct contact with fauna, including feeding.

5.4 Vegetation

Vegetation clearing can be minimised through design controls and ensuring that clearing only occurs as required.

The following management measures will be implemented to minimise vegetation clearing:

- Utilising existing disturbances where possible for mine infrastructure;
- Choosing paths of least resistance through vegetation when siting roads and other linear infrastructure (where practicable); and
- Retention of canopy trees where possible.

5.5 Weeds

Activities which disturb land and soils including clearing have the potential to create favourable conditions for weed infestation. Weeds can be difficult to eradicate once introduced and prevention of weed infestation has long term benefits for rehabilitation outcomes.

The following management measures will be implemented to manage weed impacts:

- All vehicles and equipment arriving on site will be free of soil, seeds, and vegetative matter;
- Movement of vehicles and equipment will be restricted to areas to be cleared; and
- Weed spray programs may be implemented on a seasonal basis to eradicate identified weed infestations.

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7. Appendices

Appendix A: Proof of ownership

Appendix B: Tenement data extracts

Appendix C: Biological survey

1. East Samson Dam Project Biological Survey (Onshore Environmental 2019)

Appendix C: Biological Survey

ONSHORE ENVIRONMENTAL

East Samson Dam Project
Biological Survey

Prepared for Moho Resources Ltd
9 December 2019

Document Status						
Rev No.	Authors	Reviewer/s	Date	Approved for Issue		
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EXECUTIVE SUMMARY

Moho Resources Ltd (Moho Resources) commissioned Onshore Environmental Consultants Pty Ltd (Onshore Environmental) to undertake a detailed flora and vegetation survey, and a Level 1 vertebrate fauna survey covering approximately 150 hectares associated with the East Samson Dam tenements M27/263 and E27/528, herein referred to as the study area. The study area occurs on Mt Vetters pastoral lease approximately 53km northeast of Kalgoorlie in the Goldfields region of Western Australia.

The flora and vegetation survey was completed by a Pricipal Botanist between the 21st and 24th of October 2019. The fauna assessment was undertaken by a Principal Zoologist between the 22nd and 24th November 2019.

A total number of 104 plant taxa from 23 families and 44 genera was recorded from the study area. Species representation was greatest among the Chenopodiaceae, Fabaceae, Scrophulariaceae and Myrtaceae families. The most speciose genus was *Eremophila* (14 taxa), followed by *Acacia* (13 taxa), followed by *Maireana* (9 taxa), *Eucalyptus* (8 taxa) and *Sclerolaena* (5 taxa).

None of the plant taxa recorded from the study area were gazetted as Threatened Flora pursuant to the *Biodiversity Conservation Act 2016* (BC Act), or listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Additionally, none of the taxa were listed as Priority flora taxa by the Department of Biodiversity Conservation and Attractions (DBCA), and none were considered to represent a significant range extension from their current known distributions. There were no introduced species (weeds) recorded from the study area at October 2019.

A total of 12 vegetation associations classified as nine broad floristic formations and occurring on five broad landforms were described and mapped from the study area. None of the vegetation associations were aligned with federal or state listed Threatened Ecological Communities (TECs) or state listed Priority Ecological Communities (PECs), and all were well represented at the state, bioregional and local levels.

Vegetation condition within the study area ranged from *excellent* to *good* with the largest proportion of the study area rated as *excellent* or *very good* (97% of the study area). Disturbances recorded within the study area included mine exploration, sandalwood cutting, and historical grazing by sheep.

Evidence of one conservation significant fauna species was recorded in the study area, a single nest mound belonging to the Malleefowl *(Leipoa ocellata).* The Malleefowl is listed as Vulnerable fauna under the BC Act. Nationally it is also listed as Vulnerable under the EPBC Act, and internationally is on the IUCN Red List of Threatened Species as Vulnerable.

A total of three fauna habitat types where described and mapped within the study area; open woodland, mallee, and shrubland. All three fauna habitats were considered to be well represented in the Murchison bioregion.

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1.0 INTRODUCTION

1.1 Preamble

Moho Resources commissioned Onshore Environmental to undertake a detailed flora and vegetation survey of the East Samson Dam tenements M27/263 and E27/528 (herein referred to as the study area) (Figure 1). The study area covers 184 ha (1.84 km^2) and is situated on Mt Vetters pastoral lease approximately 53 km northeast of Kalgoorlie in the Goldfields region of Western Australia.

The field survey was completed by a Pricipal Botanist from Onshore Environmental between the 21st and 24th of October 2019.

1.2 Previous Surveys

The study area is situated immediately west of the Black Swan Nickel Mine which has been operating since 1996. A number of biological surveys associated with this project provide an excellent local database that is directly relevant to the study area. The previous flora and vegetation surveys are outlined further in Section 3.1.1 and Appendix 1.

1.3 Biogeographic Regions

The latest version of the Interim Biogeographic Regionalisation for Australia (IBRA7) divides Australia into 89 bioregions based on climate, geology, landform, native vegetation and species information, and includes 419 sub-regions (Department of Environment 2013). The bioregions and sub-regions are the reporting unit for assessing the status of native ecosystems and their level of protection in the National Reserve System.

The study area is located within the Eastern Murchison sub-region (MUR01) of the Murchison bioregion, which represents the northern parts of the Yilgarn Craton. The study area lies in close proximity north of the border with the Coolgardie bioregion (Eastern Goldfields [COO03] sub-region). The Eastern Murchison is geologically characterised by internal drainage, and extensive areas of elevated red desert sandplains, salt lakes associated with paleo-drainage system and broad plains of red-brown soils with breakaways (Cowan 2001). The vegetation of this sub-region is dominated by Mulga woodlands, hummock grasslands, saltbush shrublands and *Halosarcia* shrublands (Cowan 2001).

1.4 Existing Land Use

Land tenure in the Murchison region largely consists of native pastures, and reserves and crown land, with nickel and gold mining leases. The dominant land uses in the Murchison are pastoralism in the form of cattle grazing, unallocated crown land and crown reserves, mining and conservation (Cowan 2001).

MOHO RESOURCES

East Samson Dam Project

Study Area Location

Legend

Study Area

MULGARRIE

GINDALBIE

GORDON

KING OF THE WEST LAKE

DONKEY ROCKS ROAD

BINTI BINTI ROAD

GORDON ROAD

YARRI ROAD

CARMELIA ROAD

Broad Arrow-Mulgarrie Rd

Gordons Rd

Yarri Rd

455 m

451 m

432 m

437 m

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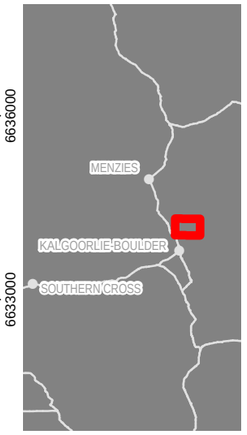

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1.5 Climate

The Murchison region has an arid climate dominated by winter rainfall in the south and summer rainfall in the north. The closest weather station to the study area is the the kalgoorlie-Boulder Airport station, approximately 55 km southwest of the study area. Average annual rainfall is 267 mm. The rainfall pattern is bimodal with a peak in February and another smaller peak in June. Summer rainfall originates from deteriorating tropical cyclones that cross the coast of northern Western Australia and dissipate to the south east. Winter rainfall results from cold fronts crossing the southern coastline and moving inland. Mean maximum summer temperatures peak at 33 degrees with mean minimum winter temperatures down to 5 degrees.

In 2019 above average monthly rainfall occurred in April and July, with the remaining months through to the October field survey recording below average falls (Figure 2). A total of 32.2 mm was received during the three months prior to the field survey, compared to the long term average of 50.8 mm for the same period. Seasonal conditions at the time of the field survey was rated as 'fair'.

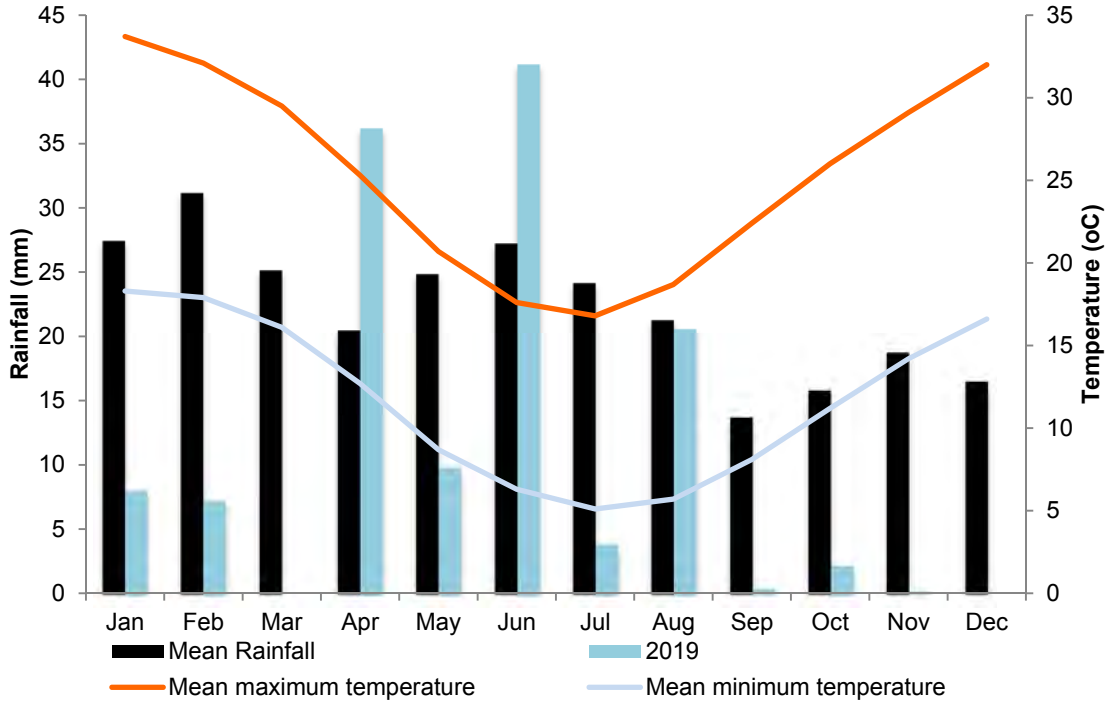


Figure 2 Rainfall and climatic data recorded at the Kalgoorlie-Boulder Airport station (12038) between January and November 2019 (Bureau of Meteorology 2019).

1.6 Soils

Tille (2007) classified the most recent and detailed mapping of Western Australia's rangelands and arid interior into a hierarchy of soil-landscape mapping units. The study area is located within the Kalgoorlie Province, which has been divided into six soil-landscape zones.

The Kambalda Zone overlies the greenstone of the Eastern Goldfields and Southern Cross Granite-Greenstone Terrane tectonic units of Tyler and Hocking (2001). It lies within the Salinaland and Coonana-Ragged Plateau Sections of Jennings and Mabbutt (1977) and is differentiated from the Norseman Zone due to the preponderance of the stony plains with acacia shrublands and halophytic shrublands, low hills with eucalypt or acacia woodlands with halophytic undershrubs, stony plains with acacia shrublands and alluvial plains with eucalypt woodlands and halophytic undershrubs rangeland land types (Pringle 1994).

The zone comprises flat to undulating plains (with hills, ranges and some salt lakes and stony plains) on greenstone and granitic rocks of the Yilgarn Craton. Soils include calcareous loamy earths and red loamy earths associated with salt lakes, red brown hardpan shallow loams and red sandy duplexes with mallee blackbutt-salmon gum-gimlet woodlands with mulga and halophytic shrublands (and some spinifex grasslands).

1.7 Landforms

The Kalgoorlie Province consists of an extensive plateau of low relief; flat to undulating plains with small valleys (occasionally broken by low narrow rocky hills, ridges, tors and bosses) are most commonly found on granitic terrain. These plains support silcrete duricrust, claypans, salt lakes with dunes and lunettes, gilgai areas, small remnants of sand plain, and small dune tracts. Low breakaways with short saline footslopes are also occasionally present. Below these plains are some broad, flat to undulating, shallow valley plains formed on Quaternary alluvium and colluvium. These plains show little defined drainage and some seasonal lakes and claypans with isolated granitic and basic rock outcrops. Slightly lower down in the landscape are broad, flat valleys with chains of salt lakes. Also present on these valley floors are saline flats, claypans, kopi dunes, sand dunes, and sometimes tors and bosses of outcropping granites. Higher up in the landscape are gently sloping to gently undulating plateau areas on granites and gneisses. These have long gentle slopes and, in places, abrupt erosional scarps. Some granitic bosses and tors are present. Rocky ranges, hills and ridges have formed on the greenstone, along with some undulating to low hilly country. Associated with this hilly terrain are gently undulating stony plains and low rises on limonite. Level to gently undulating sandplains and gravelly sandplains are mostly found over lateritic residuals and granitic basement. There are also some extensive loamy plains with sandy surfaces.

1.8 Geology

The Kalgoorlie Province is on the central eastern portion of the Yilgarn Craton, mostly overlying Archaean rocks of the Southern Cross Domain and the Eastern Goldfields Superterrane. To the north-west is the Murchison Domain. The basement rocks are a mix of granite, gneiss and greenstone. Even-grained porphyritic granitic rocks (intruded by quartz veins and dolerite dykes) are most common across the north as well as in the western half and the north-east. The largest areas of migmatite and gneiss are found in the south-west. The greatest concentration of greenstone belts is in the centre of the eastern half, between Norseman and Kalgoorlie. They are also common along the south-western margin and to the south of Lake Barlee. These greenstone belts contain a mixture of metamorphosed mafic to ultra-mafic volcanic rocks (including basalt, amphibolite, dolerite and gabbro), felsic volcanic rocks, and metasedimentary rocks (including cherts and banded iron formations). Mesoproterozoic rocks of the Albany-Fraser Orogen are found in the

south-eastern corner. These include the gneiss of the Biranup Complex and the weakly to strongly deformed granite of the Nornalup Complex. Overlying much of the Albany-Fraser Orogen is a veneer of Eocene sediments belonging to the Balladonia Shelf of the Eucla Basin. Also present north-east of Norseman is an outcrop of Mesoproterozoic arenaceous and argillaceous metasedimentary sandstone and shale of the Woodline Formation. The bedrock has been extensively weathered and laterised. Much is obscured by Tertiary and Quaternary alluvial, colluvial and aeolian deposits

1.9 Flora and Vegetation

The study area is located within the Austin Botanical District, within the Murchison IBRA region of the Eremaean Province (Beard 1990). Beard (1978) described and mapped vegetation of the Kalgoorlie area at 1:250 000, differentiating eight vegetation systems. The original vegetation mapping undertaken by Beard (1978) was refined by Shepherd *et al*. (2002), who defined one vegetation association covering the study area (Figure 3). The Pre-European extent currently remaining for Vegetation association 20 is 99.80%, with 13.34% of the current extent protected within Class I-IV conservation reserves (Table 1).

Table 1 Pre-European extent of vegetation associations occurring within the study area (Shepherd *et al.* 2002).

Vegetation Association	Description	Pre-European Extent (ha)	% Remaining	Current Extent in Class I-IV Reserves (ha)	% Current Extent in Class I-IV Reserves
20	Low woodland; mulga mixed with *Allocasuarina cristata* and *Eucalyptus* sp.	1,295,103	99.80	172,475	13.34

Pringle, Van Vreeswyk and Gilligan (1994) provide resource condition statements for the northeastern goldfields (Menzies, Edjudina, Leonora, Laverton, Sir Samuel and Duketon 1: 250 000 scale map sheets), with reference to pastoral impacts. Over these areas pastoralism covers approximately 83 percent of the survey area. The most frequently observed impact was loss of perennial species richness. Major alterations in vegetation and consequent erosion were particularly evident within the chenopod shrublands. The most recent Range Condition Report for Mt Vetters station pastoral lease found no evidence of overgrazing and rangeland was in good condition.

Vegetation and flora of the northeastern goldfields has most recently been mapped and described by Pringle, Van Vreeswyk and Gilligan (1994) as part of an inventory and condition survey completed between 1988 and 1990. Pringle et al. (1994) used an integrated survey method involving the land system approach to rangeland description and evaluation. The primary objective of the survey was to provide comprehensive descriptions and mapping of the biophysical resources of the region as well as an evaluation of the condition of the soils and vegetation. A total of 60 land systems were defined in the northeastern goldfields at a scale of 1:250,000.

As part of 'The Biological Survey of the Eastern Goldfields of Western Australia', Keighery, Milewski and Hnatiuk (in McKenzie and Hall 1992) detailed vegetation and flora of the Kurnalpi-Kalgoorlie Study Area. They describe the main vegetation

as woodland and low woodland transitional between the Southwestern Interzone (dominated by Eucalyptus) and the Austin Botanical District (dominated by Mulga). Many of the 45 vegetation complexes described featured *Casuarina cristata.* The flora listing gave three species of ferns, two conifers and 486 species of flowering plants.

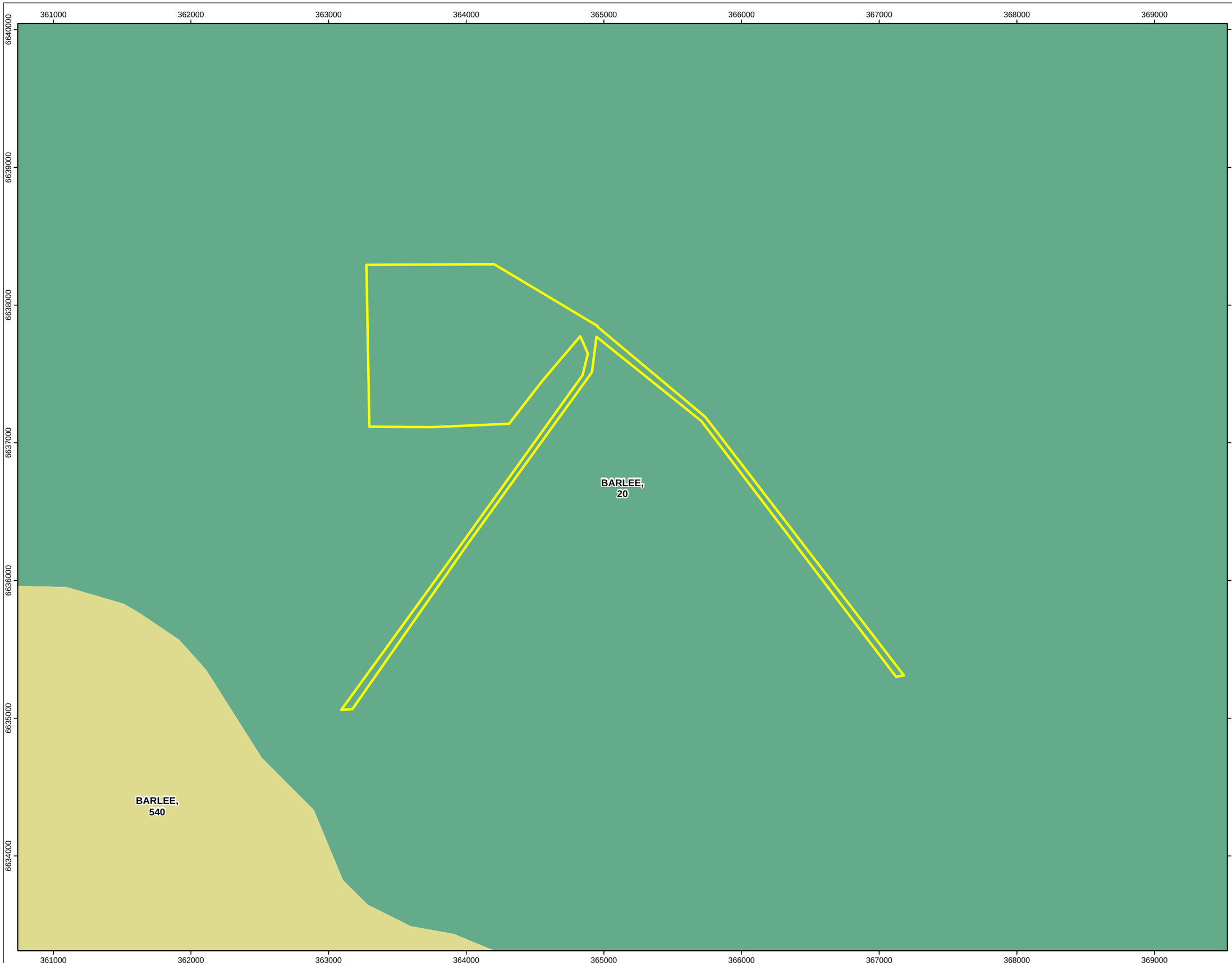
1.10 Land Systems

The Department of Agriculture (now the Department of Primary Industries and Regional Development [DPIRD]) has conducted 14 rangeland surveys since 1972. These inventory and condition surveys use an integrated survey method involving the land system approach to rangeland description evaluation. The primary objective of the surveys was to provide comprehensive descriptions and mapping of the biophysical resources of the region, as well as an evaluation on the condition of soils and vegetation. The mapping is based on patterns in topography, soils and vegetation.

A total of 74 land systems were described from the Murchison Catchment area, with five land systems represented within the study area (Table 2, Figure 4). The study area is comprised primarily of low greenstone rises and stony plains associated with the Latimore and Moriarty land systems (Figure 4).

Table 2 Land systems occurring within the study area (descriptions from Pringle *et al* 1994).

Land System	Representation with Northern Goldfields	Description
Campsite	102 km^2 or 0.1%	Alluvial plains supporting eucalypt woodlands with halophytic understoreys and acacia shrublands.
Illaara	181 km^2 or 0.2%	Plains with ironstone gravel or calcrete mantles, supporting eucalypt woodlands and mulga-casuarina shrublands.
Latimore	1,083 km^2 or 1.26%	Gently undulating gravelly plains and low rises on laterite with acacia tall shrublands and occasional eucalypt trees.
Leonora	1,074 km^2 or 1.1%	Low greenstone hills and stony plains, supporting mixed stony chenopod shrublands.
Moriarty	430 km^2 or 0.4%	Low greenstone rises and stony plains, supporting chenopod shrublands with patchy eucalypt overstoreys.



ONSHORE ENVIRONMENTAL

MOHO RESOURCES

East Samson Dam Project

Beard (1975) vegetation complexes within the study area

Legend

- Study Area

Pre-European Vegetation (Beard 1975)

- BARLEE, 20
- BARLEE, 540

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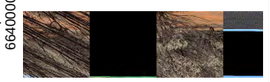

MOHO RESOURCES

East Samson Dam Project

Land systems occurring within the study area (descriptions from Pringle *et al.* 2004)

Legend

Study Area

Land Systems

- RGECAM, Campsite Land System
- RGEGUN, Gundockerta Land System
- RGEHEL, Helag Land System
- RGEILL, Illaara Land System
- RGELEO, Leonora Land System
- RGELTM, Latimore Land System
- RGEMOR, Moriarty Land System

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2.0 METHODOLOGY

2.1 Legislation and Guidance Statements

The detailed flora and vegetation survey was carried out in a manner that was compliant with Environmental Protection Authority (EPA) requirements for the environmental surveying and reporting of flora and vegetation in Western Australia:

- Technical Guidance Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016a); and
- Environmental Factor Guideline: Flora and Vegetation (EPA 2016b).

The Level 1 vertebrate fauna survey was carried out in a manner that was compliant with EPA requirements for the environmental surveying and reporting of vertebrate fauna in Western Australia:

- Statement of Environmental Principles, Factors and Objectives (EPA 2018);
- Environmental Factor Guideline Terrestrial Fauna (EPA 2016a);
- Technical Guidance Sampling Methods for Terrestrial Vertebrate Fauna (EPA 2016b);
- Technical Guidance Terrestrial Fauna Surveys (EPA 2016c);
- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2010a) Survey Guidelines for Australia's Threatened Bats;
- DEWHA (2010b) Survey Guidelines for Australia's Threatened Birds;
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) (2011a) Survey Guidelines for Australia's Threatened Mammals;
- DSEWPC (2011b) Survey Guidelines for Australia's Threatened Reptiles; and
- DEWHA (2010c) Survey Guidelines for Australia's Threatened Frogs.

2.2 Desktop Assessment

2.2.1 Literature Review

Regional scale reports relevant to the study area locality were reviewed, including:

- a summary of bioregional data (Cowen 2001);
- land systems mapping (Pringle *et al* 1994, Curry *et al* 1994, Payne *et al* 1998); and
- vegetation description and mapping by Beard (1976).

In addition, there was a review of all publicly available literature. While no previous surveys have been completed within the study area, a number of surveys were undertaken at the nearby Black Swan Nickel Mine as part of project approval (Onshore Environmental 1995) and associated expansions (Onshore Environmental 2004a, 2004b). The previous survey work is summarised in more detail in Section 3.1 and Appendix 1.

2.2.2 Database Searches

Desktop searches included databases relating to significant flora, TECs and PECs previously collected or described within, or in close proximity to, the study area. For this report the search was extended beyond the study area to place flora values into a local and regional context. The following databases were searched:

- NatureMap1: This database represents the most comprehensive source of information on the distribution of Western Australia's flora and fauna, comprising records from the Department of Biodiversity, Conservation and Attractions (DBCA) Threatened Flora database and the WA Herbarium Specimen Database (50 km radial search, accessed September 2019) (DPaW 2018);
- DBCA's Threatened and Priority flora database was searched to confirm the NatureMap results (50 km radial search, accessed 23 October 2019) (DBCA 2019a);
- DBCA's TEC, PEC and Environmentally Sensitive Areas (ESAs) database was searched to identify significant communities (50 km radial search, accessed 29 October 2019b);
- DBCA's Threatened Fauna Database was searched to confirm the NatureMap results (50 km radial search around the central point GDA94 Zone 50 - 414500E 6252000N, accessed 25 October 2018) (DBCA 2019c);
- EPBC Act Protected Matters database (20 km radial search, accessed 24 October 2019) (DoEE 2019); and
- International Union for Conservation of Nature (IUCN) database, accessed October 2019 (IUCN 2019).

2.2.3 Assessment of Likelihood of Occurrence in the Study Area

A list of conservation significant species occurring within a 50 km radius of the study area was compiled during the desktop searches. The likelihood of each taxon occurring within the study area was assessed using a set of rankings and criteria (Table 3) based on presence of suitable landform (inferred from aerial imagery with contours overlayed and from knowledge of the adjacent areas) and distance to known records.

Table 3 Ranking system used to assign the likelihood that a species would occur in the study area.

Rank	Criteria
Recorded	The species has been recorded in the study area.
Likely to occur	The species has previously been recorded from a landform which is present within the study area, and there are previous records within a 20 km radius of the study area.
Possible to occur	The species has previously been recorded from a landform which is present within the study area, and there are previous records within a 50 km radius of the study area.
Unlikely to occur	The landform from which the species has previously been recorded is absent within the study area, and/or there are no previous records within a 50 km radius of the study area.

2.2.4 Assessment of Conservation Significance

The conservation significance of fauna and ecological communities are classified at a Commonwealth, State and Local level on the basis of various Acts and Agreements, including:

International Level:

- IUCN: The IUCN 'Red List' lists species at risk under nine categories (status codes) (Appendix 2); and

- International Conventions: Migratory taxa listed under the Japan-Australia Migratory Bird Agreement (JAMBA), China-Australia Migratory Bird Agreement (CAMBA), Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA), and Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

Commonwealth Level:

- EPBC Act: The DoEE lists Threatened fauna and ecological communities, which are determined by the Threatened Species Scientific Committee according to criteria set out in the Act. The Act lists flora that are considered to be of conservation significance under one of six categories (Appendix 3).

State Level:

- BC Act: At a State level, native fauna species are protected under the BC Act – Wildlife Conservation Notice. A number of species are assigned an additional level of conservation significance based on a limited number of known populations and the perceived threats to these locations (Appendix 4); and
- DBCA Priority list: DBCA produces a list of Priority species and ecological communities that have not been assigned statutory protection under the WC Act. Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added under Priorities 1, 2 or 3. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been removed from the threatened species list for other taxonomic reasons, are placed in Priority 4. These species require regular monitoring (see Appendix 5). The list of PECs identifies those that need further investigation before nomination for TEC status at a State level.

Local Level:

- Species may be considered of local conservation significance because of their patterns of distribution and abundance. Although not formally protected by legislation, such species are acknowledged to be in decline as a result of threatening processes, primarily habitat loss through land clearing.

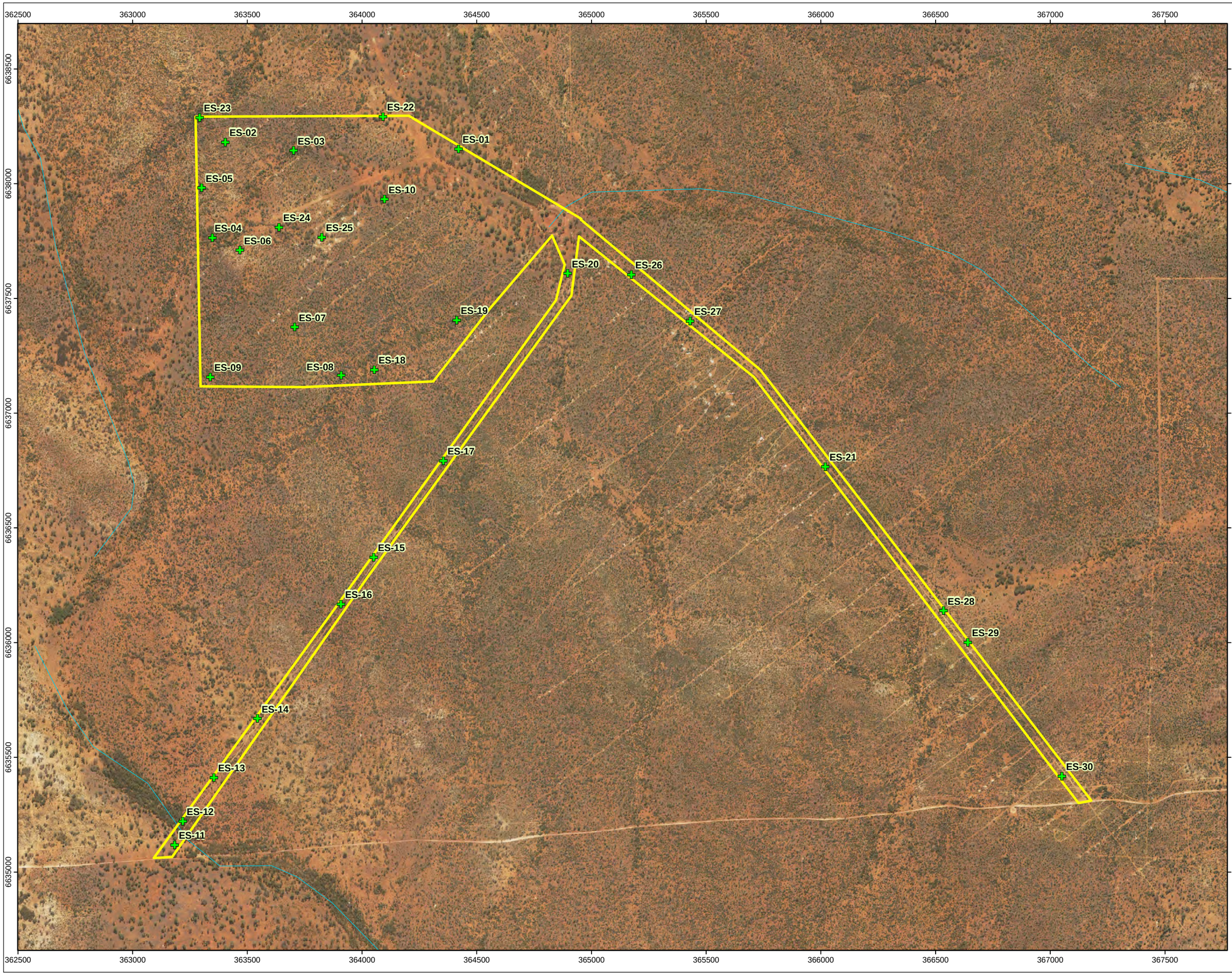
2.3 Flora & Vegetation Survey Methodology

2.3.1 Timing and Personnel

The flora and vegetation survey was completed by Principal Botanist Dr Jerome Bull working between the 21st and 24th of October 2019. The field botanist has 15 years experience working in the Murchison and Goldfields regions.

2.3.2 Sampling of Study Sites

The field survey involved systematic sampling using quadrats (referred to as study sites). Relevé vegetation descriptions were made to increase the accuracy of vegetation mapping and targeted searches were completed in habitats where it was anticipated that significant flora might occur (Figure 5). The study sites were 20 m by 20 m in dimension which is standard for the Murchison bioregion. The number of study sites sampled was determined by the size and heterogeneity of the study area, and confirmed by a species accumulation curve (Figure 6). A total of 30 quadrats were formally assessed. The locations of all quadrats sampled are provided in Figure 5.



ONSHORE ENVIRONMENTAL

MOHO RESOURCES

East Samson Dam Project

Sample Locations

Legend

- Study Area
- Sample Location

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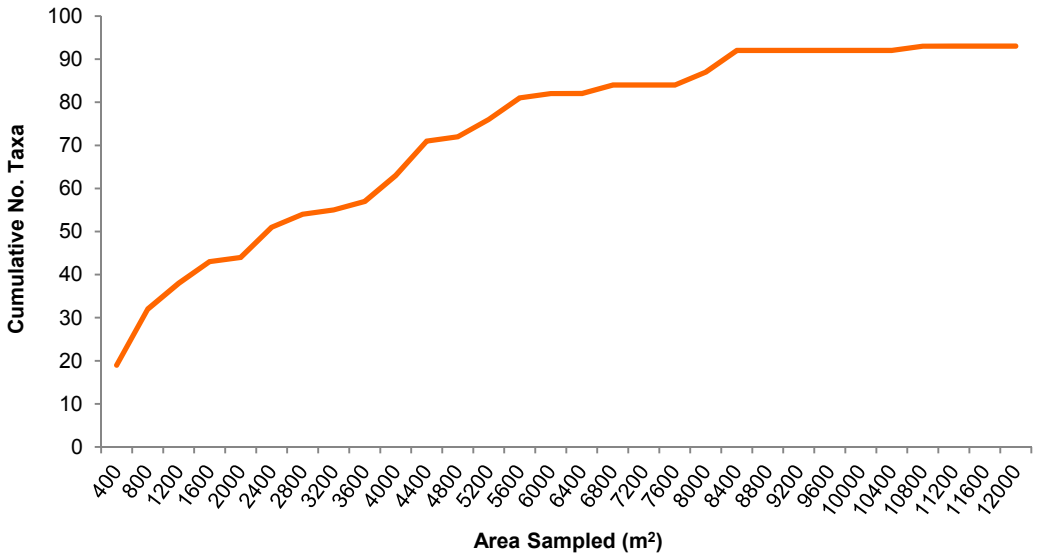


Figure 6 Species accumulation curve for the 30 quadrats formally assessed within the study area.

The sampling sites were assessed to provide a list of the total flora occurring within the study area and a description of the vegetation structure. Data collected covered a range of environmental parameters including:

- Landform and habitat;
- Aspect;
- Soil colour and soil type;
- Rock type;
- Slope (angle);
- Vegetation condition;
- Disturbance (caused by fire, clearing, grazing etc.);
- Age since fire;
- Broad floristic formation;
- Vegetation association description; and
- Height and percentage ground cover provided by individual plant taxa.

Other parameters recorded for each study site were:

- Study site number and date of assessment;
- Names of the botanists undertaking the assessment;
- Location description a waypoint – GPS coordinate (GDA94) using a handheld GPS; and
- Photograph number.

Vegetation condition for each of the study sites was determined using a recognised rating scale (based on Keighery 1994, see Appendix 6).

2.3.3 Targeted Surveys for Conservation Significant Species

Targeted searches for species of conservation significance were completed within the study area. Ground truthing provided an opportunity to record opportunistic locations for Threatened and Priority listed flora and undertake closer examination of specific landforms where conservation significant flora would be expected to occur.

2.3.4 Weed Survey and Mapping

Introduced species were recorded from the study sites assessed within the study area. Opportunistic collections were also made while moving throughout the study area, with targeted weed searches completed in high moisture habitats.

2.3.5 Floristic Analysis

A multivariate statistical analysis of the floristic quadrat data (30 quadrats) was completed to assist in understanding the vegetation-habitat relationships within the study area. Statistical analysis of quadrat data can support delineation of vegetation associations within the study area, and provide comparison against locally significant communities (TECs and PECs) where quadrat data is available.

A two-way classification (Agglomerative Hierarchical Fusion) of the presence/absence quadrat data was carried out on the 104 taxa x 30 quadrat dataset using the program PATN (Belbin 2003). The flexible unweighted pair group method with arithmetic mean (UPGMA) classification strategy was used (ß = -0.1), together with the Bray-Curtis site similarity measure. The number of groups to be determined was set at 12. The primary output of the classification was in the form of a dendrogram (Appendix 7).

The results from the statistical analysis need to be appropriately analysed by an experienced botanist, and effects such as fire disturbance, ephemeral taxa, and spatial distribution of quadrats taken into consideration when interpreting the results. Plant taxa that occupy a range of vegetation types can obscure vegetation patterning and influence statistical outputs. It must be acknowledged that the results of multivariate statistical analysis may not always align with the delineated vegetation associations; in these insistences an explanation for the differences will be provided.

2.3.6 Vegetation Association Mapping

The classification of vegetation associations within the study area follow the height, life form and density classes of Specht (1970) as modified by Aplin (1979) and Trudgen (2009) (see Appendix 8). This is largely a structural classification suitable for broader scale mapping, but taking all ecologically significant strata into account.

The description of vegetation associations lead with the most dominant strata (based on percent cover) and flora species listed start with the most dominant (Table 4). Table 5 further describes and categorises these strata and gives examples of potential growth forms for each, e.g. over-storey (U), mid-storey (M) and under-storey (G) vegetation strata.

Vegetation associations recorded within the study area are grouped according to ‘broad floristic formation’ (refer to Table 4). A broad floristic formation describes the dominant growth form, cover and height as well as the dominant land cover genus for the dominant stratum (DEH 2003).

The vegetation mapping utilised high-resolution aerial photography of the entire study area at a scale of 1:10,000, with definition of vegetation polygons based on contrasting shading patterns. Ground-truthing of the study area was completed during the survey with vegetation descriptions made within selected vegetation polygons to confirm dominant structural layers and associated plant taxa. The 30 study sites and numerous relevé plots were overlaid on the aerial photography, and

associated flora and vegetation data was used to provide vegetation association descriptions for individual polygons defined.

2.3.7 Vegetation Association Coding

A vegetation association code is applied to each vegetation association. This code is comprised of the dominant landform on which the vegetation association occurs and the dominant plant taxa in each vegetation stratum.

2.3.8 Vouchering

At least one voucher specimen was taken for each species collected to verify identification. Taxonomy was completed by Dr Jerome Bull at the Western Australian Herbarium (WAH) with use made of the WAH for confirmation of species identification.

Table 4 Vegetation association descriptions (based on the methods used under the National Vegetation Information System, Department of the Environment 2003).

Description	Species	Cover	Soils	Landscape Position	Example
Broad Floristic Formation	The one dominant genus name for the dominant stratum, e.g. *Acacia*	One cover class for the dominant stratum, e.g. Low Woodland. If two strata have the same cover range, the taller stratum is listed	Not relevant	Not relevant	*Acacia* Low Woodland
Vegetation Association (describe three strata – refer Table 5)	Up to three dominant species listed for each stratum, e.g. *Acacia incurvaneura* , *Acacia pruinocarpa* and *Acacia pteraneura*	One cover class code for each stratum, e.g. Low Open Woodland, Open Shrubland, Low Open Shrubland	State soil colour and type, e.g. red sandy loam	Include the landscape position, e.g. stony plain	Low Open Woodland of *Acacia incurvaneura, A.pruinocarpa* & *A.pteraneura* over Open Shrubland of *Eremophila spathulata* over Low Open Shrubland of *Ptilotus schwartzii, P.obovatus* & *Solanum lasiophyllum* on red sandy loam on stony plains

Table 5 Vegetation Stratum Levels (modified from Department of the Environment 2003).

Stratum Description	Example Growth Forms
Over-storey (U)	
Tallest tree sub-stratum; for forests and woodlands this will generally be the dominant stratum	Trees, tree mallee, and vines (mallee shrubs)
Sub-canopy layer; second tree layer	
Sub-canopy layer; third tree layer	
Mid-storey (M)	
Tallest shrub layer	Shrubs, low trees, mallee shrubs, grass-trees, tree-ferns, cycads, palms, and vines (low shrubs, tall grasses, tall forbs, tall sedges)
Second shrub layer	
Third shrub layer	
Under-storey (U)	
Tallest ground species	Grasses, forbs, sedges, rushes, lichens, epiphytes, low shrubs, ferns, bryophytes, cycads, grass-trees, and vines
Other ground species	

2.3.9 Field Survey Constraints

The EPA Technical Guidance for Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA 2016a) list seven potential limitations that field surveys may encounter. These limitations are addressed in Table 6.

Table 6 Relevance of limitations, as identified by EPA (2016a), to the flora and vegetation survey.

Constraint	Relevance
Availability of contextual information at a regional and local scale	While no previous surveys have been completed within the study area, a number of surveys were undertaken at the nearby Black Swan Nickel Mine as part of project approval (Onshore Environmental 1995) and associated expansions (Onshore Environmental 2004a, 2004b). These surveys provide an excellent local database.
Proportion of flora recorded and/or collected, any identification issues	It is likely that a large proportion of the total flora occurring within the study area was recorded given the high intensity sampling completed for the field survey. The seasonal conditions at the time of survey were rated as fair, resulting in the species level identification of a small number of ephemeral taxa not being confirmed; these taxa did not include conservation significant flora.
Survey timing, rainfall, season of survey	The field survey was completed during the spring period in the Goldfields, as per recommendations made by EPA (2016). A total of 32.2 mm was received during the three months prior to the field survey, and seasonal conditions were rated as 'fair'. Good flowering was observed during the survey, however some annual grass species were in poor condition making identification difficult.
Disturbance that may have affected the results of the survey such as fire, flood or clearing	There were no disturbances recorded within the study area that influenced survey outcomes. Disturbances within the study area were restricted to mine exploration and access tracks, historical sandalwood cutting, and low intensity grazing by sheep. Disturbances did not impact on the ability to complete the field survey.

Constraint	Relevance
Was the appropriate area fully surveyed (effort and extent)	A Principal Botanist botanist spent four field days covering the entire study area. A total of 30 quadrats supplemented by numerous relevé sites were assessed within the study area. This represented an extensive survey effort. The latest EPA technical guidelines (EPA 2016a) recommends that a minimum of three quadrats should be sampled in each vegetation unit. Six of the 12 vegetation associations mapped within the study area have less than three quadrats due to the small size of these units; all of these units were thoroughly ground trothed to ensure comprehensive coverage was achieved.
Access restrictions within the survey area	The study area was accessed by vehicle and on foot, noting that vegetation mapping was facilitated by high-resolution aerial photography. Access did not pose any restrictions to undertaking the field survey.
Competency/experience of the team carrying out the survey, including experience in the bioregion surveyed	The Principal Botanist working on the survey (Dr Jerome Bull) has more than 15 years' experience working in the region, and has completed a number of surveys in close proximity to the study area.

2.4 Fauna Survey Methodology

2.4.1 Timing and Personnel

The vertebrate fauna survey was completed by Senior Zoologist from Onshore Environmental, Mr Michael Brown, working over a three-day field trip from the 22nd to the 24th of November 2019.

2.4.2 Surveying of Study Area

The entire study area was ground truthed and assessed to document habitat characteristics including evaluation of the presence of habitats suitable to support conservation significant fauna. The survey recorded any observations of fauna species made via primary or secondary evidence. In addition, low intensity sampling was undertaken involving bird census and active foraging. Targeted searches (as detailed below) were also undertaken for conservation significant fauna species identified during the database review.

The following parameters were recorded for all conservation significant fauna:

- Co-ordinate locations;
- Description of habitat in which the species was located; and
- Photograph of the species, evidence of species and/or habitat.

Targeted Fauna Searches

Targeted searches were undertaken for conservation significant fauna species throughout the study area. The study area was traversed on foot, providing an opportunity to opportunistically record evidence of Threatened and Priority listed fauna and undertake closer examination of specific habitats where conservation significant fauna species may be expected to occur.

Camera Trap Surveying

Baited and non-baited camera traps were deployed throughout the study area to identify species of fauna likely to be utilising the area. Five sites of two cameras were deployed within the study area using non-rewarding bait.

Active Foraging

Active foraging, involving raking litter and turning over rocks, was completed throughout the study area. Records were captured for any conservation significant species sighted during foraging.

Avifauna Surveying

A Bioacoustics Audio Recorder (BAR) was used to record crepuscular audio within the study area. One unit deployed over one night within the centre of the study area. This BAR unit was set up to record for an hour before and after sunrise and sunset.

Malleefowl have previously had numerous records within the region and were targeted during this survey by having transects walked within potential habitat. Aerial photography was also used to identify potential nest sites which were then visited in the field. Transects targeting this species were walked at varying distances between <20 metres to 50 metre depending on vegetation density and visibility.

Opportunistic Recordings

During the survey work non-systematic opportunistic observations and searches were made and recorded. These recordings focused primarily on conservation significant fauna and included the recording of secondary evidence such as tracks, scats, diggings, and feeding signs.

2.4.3 Fauna Habitat Mapping

Assessments of the habitat were undertaken throughout the study area to document habitat characteristics and map the fauna habitat types. The fauna habitat mapping utilised high-resolution aerial photography of the study area at a scale of 1:10,000. Ground-truthing of the study area was completed during the survey with habitat characteristics recorded at each habitat assessment site, and the habitat type selected for each polygon. Vegetation association mapping was utilised to further aid in characterising the habitat map accuracy across the full extent of the study area.

2.4.4 Species Identification and Nomenclature

Vertebrate fauna species were identified at the time of capture/observation in the field by the Principal Zoologist. All species were able to be fully identified with no specimens needed to be taken for further examination. Nomenclature and conservation significance rankings used in this report are in accordance with the current listing of WA fauna recognised by the DBCA, as listed on NatureMap.

2.4.5 Survey Constraints

The EPA Technical Guidance (EPA 2016c) list potential limitations that field surveys may encounter. Limitations associated with the Level 1 vertebrate fauna survey, are addressed in Table 7. There were no survey-specific limitations for this survey.

Table 7 Relevance of limitations, as identified by EPA (2016c), to the vertebrate fauna survey.

Variable	Impact on Survey Outcomes
Experience levels	The biologist who executed this survey was a practitioner suitably qualified in their respective field; Mike Brown (Principal Zoologist > 14 years' experience).
Scope (fauna groups sampled)	All allocated tasks were achieved during the survey, with foraging, bird surveys and targeted searches undertaken. No nocturnal work was undertaken during this survey.
Timing, weather, and season.	The survey was undertaken in November (Spring) 2019 and within the recommended survey season for species within this region (Department of Sustainability, Environment, Water, Populations and Communities, 2012). The weather during the survey and for the three months prior were consistent with the climate data for the region, and therefore is considered to have no effect on the outcome of this current survey.
Disturbance to site which may affect survey results	Disturbances within the study area included grazing of vegetation and previous exploration drilling programs. None of the disturbances were a constraint to the completeness of the survey.
Remoteness and/or access	There was no access restriction experienced during the survey. The study area was accessible by vehicle and on foot.
Completeness	There were no weather, access, or timing issues relating to this survey that would affect the outcome and is therefore considered to be a complete survey.

3.0 RESULTS

3.1 Desktop Review

3.1.1 Previous Baseline Flora Surveys

The flora and vegetation of the Murchison has been assessed at a broad scale by Gardner (1942) and Beard (1976). More recently, the Department of Agriculture (now DPIRD) completed inventory and condition surveys of the Murchison and Sandstone-Yalgoo-Paynes Find area based on land system mapping (Curry *et al* 1994, Payne *et al* 1998). In addition to the larger broad scale surveys, a number of smaller intensive flora and vegetation surveys have been completed in recent years associated with resource development projects. These surveys have resulted in the collection of a significant amount of site-specific biological survey data, most of which has been undertaken for formal environmental impact assessment.

While no previous surveys have been completed within the boundary of the study area, a number of surveys have been undertaken at the nearby Black Swan Nickel Mine (2.6 km to the east) as part of project approval (Onshore Environmental 1995) and associated expansions (Onshore Environmental 2004a, 2004b). No significant flora have been recorded from the vicinity of the Black Swan Nickel operations, and vegetation is well represented at state, bioregion and local levels. Findings from the literature review are summarised in Appendix 1 including survey timing, survey type, flora statistics, vegetation associations, significant flora and introduced species recorded.

3.1.2 Threatened Flora and Fauna listed under the EPBC Act

A search of the EPBC Act Protected Matters database was undertaken for a 50 km radius around the study area (DoEE 2019). No Threatened Flora as listed under the EPBC Act have been recorded as occurring within the 50 km search radius for the study area. The database search listed seven Threatened fauna species, or species habitat, that may occur in the study area:

Mammals

- Numbat *(Myrmecobius fasciatus)* – listed as Endangered;
- Chuditch *(Dasyurus geoffroii)* – listed as Vulnerable; and
- Greater Bilby *(Macrotis lagotis)* – listed as Vulnerable.

Reptiles

- Western Spiny-tailed Skink *(Egernia stokesii badia)* – listed as Vulnerable.

Birds

- Curlew Sandpiper *(Calidris ferruginea)* – *listed* as Critically Endangered and Migratory;
- Carnaby's Black Cockatoo *(Calyptorhynchus latirostris)* – listed as Endangered; and
- Malleefowl *(Leipoa ocellate)* – listed as Vulnerable.

The database search also identified nine Migratory bird species, or species habitat that may occur in the study area:

- Grey-tailed Tattler *(Tringa brevipes)* – listed as Migratory;
- Glossy Ibis *(Plegadis falcinellus)* – listed Migratory;
- Oriental Plover *(Charadrius veredus)* – listed as Migratory;

- Common Greenshank *(Tringa nebularia)* – listed as Migratory;
- Wood Sandpiper *(Tringa glareola)* – listed as Migratory;
- Common Sandpiper *(Actitis hypoleucos)* – listed as Migratory;
- Red-necked Stint *(Calidris ruficollis)* – listed as Migratory;
- Sharp-tailed Sandpiper *(Calidris acuminata)* - listed as Migratory; and
- Wood Sandpiper *(Tringa glareola).*

3.1.3 Threatened Flora and Fauna listed under the IUCN Red List

A search of the International Union for Conservation of Nature (IUCN) database (IUCN 2019) determined that no Threatened Flora taxon was likely to occur within the study area.

A search of the IUCN database (IUCN 2019) determined that one Endangered and two Vulnerable fauna species had a distribution in the vicinity of the study area:

- Numbat *(Myrmecobius fasciatus)* – listed as Endangered;
- Chuditch *(Dasyurus geoffroii)* – listed as Vulnerable; and
- Greater Bilby *(Macrotis lagotis)* – listed as Vulnerable.

3.1.4 Threatened Flora and Fauna listed under the BC Act

No Threatened Flora taxon were identified from the DBCA rare flora database search (DBCA 2017) as occurring within a 50 km radius of the study area.

The DBCA rare fauna database search (DBCA 2019b) and NatureMap search (DPaW 2019) identified 14 species listed as Scheduled species under the BC Act from a 50 km radius around the study area:

Mammals

- Numbat *(Myrmecobius fasciatus)* – listed as Endangered;
- Chuditch *(Dasyurus geoffroii)* – listed as Vulnerable; and
- Greater Bilby *(Macrotis lagotis)* – listed as Vulnerable.

Reptiles

- Western Spiney-tailed Skink *(Egernia stokesii badia)* – listed as Vulnerable.

Birds

- Curlew Sandpiper *(Calidris ferruginea)* – listed Critical;
- Grey-tailed Tattler *(Tringa brevipes)* – listed as Migratory;
- Glossy Ibis *(Plegadis falcinellus)* – listed Migratory;
- Oriental Plover *(Charadrius veredus)* – listed as Migratory;
- Common Greenshank *(Tringa nebularia)* – listed as Migratory;
- Wood Sandpiper *(Tringa glareola)* – listed as Migratory;
- Common Sandpiper *(Actitis hypoleucos)* – listed as Migratory;
- Red-necked Stint *(Calidris ruficollis)* – listed as Migratory;
- Sharp-tailed Sandpiper *(Calidris acuminata)* - listed as Migratory;
- Malleefowl *(Leipoa ocellate)* – listed as Vulnerable; and
- Peregrine Falcon *(Falco peregrinus)* – listed as 'Other specially protected species'.

3.1.5 Priority Flora and Fauna recognised by the DBCA

The DBCA rare flora database search (DBCA 2019a) identified 18 Priority flora taxa as potentially occurring within a 50 km radius of the study area (Table 8). None of these taxa were considered 'likely' to occur within the study area (as per criteria

set out in Table 3) based on occurrence of habitat and proximity of previous records (Table 8). It was considered 'possible' that five taxa identified during the database searches may occur within the study area (Table 8).

The DBCA Rare Fauna database search (DBCA 2019b) and NatureMap search (DPaW 2019) identified six Priority fauna species as potentially occurring within a 50 km radius of the study area:

Reptiles

Woma (Aspidites ramsayi) – listed as Priority 4.

Birds

Grey-tailed Tattler (Tringa brevipes) – listed as Priority 4;
Blue-billed Ducks (Oxyura australis) – listed as Priority 4;
Hooded Plover (Thinornis rubricollis) – listed as Priority 4;
Western False Pipistrelle (Falsistrellus mackenziei) – listed as Priority 4; and
Western Grasswren (Amytornis textilis textilis) – listed as Priority 4.

A total of 23 conservation significant fauna species were identified during the desktop assessment. These species are detailed further in Table 9.

Table 8 Significant flora previously recorded from a 50 km search radius of the study area (DBCA 2019a).

Taxon	Cons Code	Life Form	Habitat Preference	Nearest Record (km)	Suitable Habitat Present	Likelihood in the Study Area
Acacia epedunculata	1	Perennial	Yellow sand, sandplains.	15	No	Unlikely
Angianthus prostratus	3	Annual	Red brown loam, red clay or loamy soils, saline depressions.	33	No	Unlikely
Cyathostemon verrucosus	3	Perennial	Pale brown / yellowish deep sand over granite.	50	No	Unlikely
Elachanthus pusillus	2	Annual	Gentle upper slope with a SE/S aspect, on red clay soils with greenstone and granite gravel.	45	Yes	Possible
Eremophila praecox	1	Perennial	Red brown loam, flats, undulating plains.	30	Yes	Possible
Eremophila xantholaema	1	Perennial	Hill slope, orange brown loam, with quartz and ironstone pebbles/rocks.	50	No	Unlikely
Eucalyptus jutsonii subsp. *jutsonii*	4	Perennial	Red, yellow or orange deep sand; sandplains and dunes.	50	No	Unlikely
Eucalyptus x brachyphylla	4	Perennial	Sandy loam, granite rocks and outcrops.	50	No	Unlikely
Frankenia glomerata	4	Perennial	Low sandy rise within broad braided saline drainage line, saline sand.	50	No	Unlikely
Lepidium fasciculatum	3	Annual	Red earth soils, flats.	50	Yes	Possible
Melaleuca coccinea	3	Perennial	Sandy loam over granite. Granite outcrops, sandplain, river valleys.	50	No	Unlikely
Ptilotus chortophytus	1	Annual	Quartz hill.	50	No	Unlikely
Ptilotus procumbens	1	Annual	Wash away in deep red clay; Broad flat, red cracking clay.	50	Yes	Possible
Ptilotus rigidus	1	Perennial	Small quartz hill on the outer edges of a large salt lake.	20	No	Unlikely
Rhodanthe uniflora	1	Annual	Stony flat plain, red brown clay.	35	Yes	Possible
Ricinocarpos sp. Eastern Goldfields (A. Williams 3)	1	Perennial	Rocky hillslope. Dry red-brown sandy loam over felsic and mafic volcanics.	15	No	Unlikely
Thryptomene eremaea	2	Perennial	Red or yellow sand, sandplains.	10	No	Unlikely
Xanthoparmelia dayiana	3	Perennial	Granite rock.	35	No	Unlikely

Table 9 Conservation significant fauna species identified during the desktop assessment (DBCA 2019b, NatureMap 2019).

Common Name	Scientific Name	Cons. Code				Habitat Preference	Suitable Habitat Present	Likelihood in the Study Area
		EPBC Act	WC Act	IUCN	DBCA			
Mammals								
Numbat, Walpurti	*Myrmecobius fasciatus*	EN	EN, S2	EN		Eucalyptus woodland and forests.	Yes	Unlikely
Bilby, Dalgyte,	*Macrotis lagotis*	VU	VU, S3	VU		Open tussock grassland, mulga woodlanf/shrubland on ridges and rises and hummock grassland on sandplains	No	Unlikely
Chuditch, Western Quoll	*Dasyurus geoffroii*	VU	VU, S3	VU		Traditionally occupied a wide range of habitat, but today survives in *Eucalyptus* forest	Yes	Unlikely
Reptiles								
Western Spiney-tailed Skink	*Egernia stokesii badia*	EN	VU, S3	EN		York gum, and Salmon Gum woodland with an abundance of hollow logs.	Yes	Unlikely
Woma	*Aspidites ramsayi*			LC	P1	Know to occur on sandplains	No	Unlikely
Birds								
Curlew Sandpiper	*Calidris ferruginea*	CR	CR, S1	NT		Intertidal mudlats and ephemeral and permanent lakes	No	Unlikely
Carnaby's Cockatoo	*Calyptorhynchus latirostris*	EN	EN, S2	EN		Native woodland dominated by large trees like Eucalyptus and Wandoo, as well as nearby heathland.	No	Unlikely
Malleefowl	*Leipoa ocellata*	VU	VU, S3	VU		Scrubland and woodland dominated by mallee and wattle species.	Yes	Recorded
Common Greenshank, Greenshank	*Tringa nebularia*	Mi	S5	LC		Intertidal mudflats and ephemeral and permanent lakes	No	Unlikely
Common Sandpiper	*Actitis hypoleucos*	Mi	S5	LC		Lakes and wetlands	No	Unlikely
Glossy Ibis	*Plegadis falcinellus*	Mi	S5	LC		Lakes and wetlands	No	Unlikely
Grey-tailed Tattler	*Tringa brevipes*	Mi	S5	LC		Lakes and wetlands	No	Unlikely
Oriental Plover	*Charadrius veredus*	Mi	S5	LC		Open grasslands	No	Unlikely
Red-necked Stint	*Calidris ruficollis*	Mi	S5	LC		Lakes and wetlands	No	Unlikely
Ruddy Turnstone	*Arenaria interpres*	Mi	S5	LC		Lakes and wetlands	No	Unlikely
Sanderling	*Calidris alba*	Mi	S5	LC		Lakes and wetlands	No	Unlikely
Sharp-tailed Sandpiper	*Calidris acuminata*	Mi	S5	LC		Lakes and wetlands	No	Unlikely
Western False Pipistrelle,	*Falsistrellus mackenziei*			LC	P4	Old growth forest dominated by wet scherophyll forest.	No	Unlikely

Common Name	Scientific Name	Cons. Code				Habitat Preference	Suitable Habitat Present	Likelihood in the Study Area
		EPBC Act	WC Act	IUCN	DBCA			
Wood Sandpiper	*Tringa glareola*	Mi	S5	LC		Lakes and wetlands	No	Unlikely
Peregrine Falcon	*Falco peregrinus*			LC	OS	Found in most habitats, however, prefers cliffs or woodlands with water.	Yes	Possible
Blue-billed Duck	*Oxyura australis*			LC	P4	Lakes and wetlands	No	Unlikely
Hooded Plover, Hooded Dotterel	*Thinornis rubricollis*			LC	P4	Lakes and wetlands	No	Unlikely
Western Grasswren	*Amytornis textilis textilis*			LC	P4	Semi-arid shrublands on dunes, plains and drainage.	No	Unlikely

3.1.6 TECs listed under State and Federal Legislation

A search of the EPBC Act Protected Matters database (DoEE 2019) confirmed there were no federal listed TECs previously recorded within, or adjacent to, the study area. Similarly, a search of the DBCA ecological community database (DBCA 2019b) confirmed there were no state listed TEC records for the immediate study area.

3.1.7 PECs recognised by DBCA

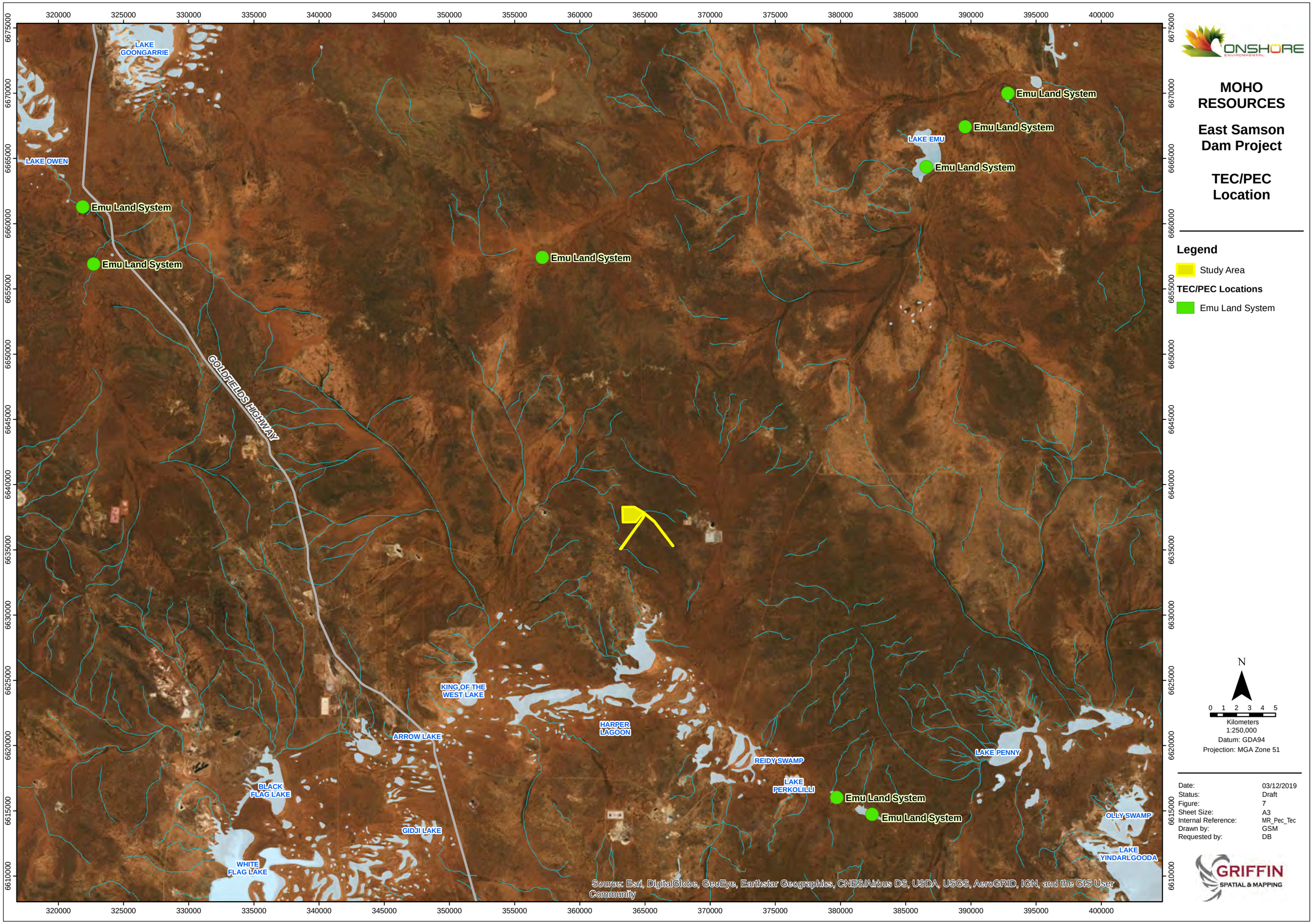
A search of DBCA's ecological community database (DBCA 2019) confirmed one PEC occurring within a 50 km radius of the study area; Emu Land System (Priority 3iii) (Figure 7). Land system mapping by Pringle *et al* (1994) confirms that the Emu Land System does not occur within the study area, with the nearest occurrence situated approximately 20 km to the north.

3.2 Flora Species

A total number of 104 plant taxa (including varieties and subspecies) from 23 families and 44 genera were recorded from the study area (Table 10, Appendix 9). Species representation was greatest among the Chenopodiaceae, Fabaceae, Scrophulariaceae and Myrtaceae families (Table 10). The most speciose genus was *Eremophila* (14 taxa), followed by *Acacia* (13 taxa), followed by *Maireana* (9 taxa), *Eucalyptus* (8 taxa) and *Sclerolaena* (5 taxa).

Table 10 Statistics for total flora recorded from the study area.

Overview	No. Taxa
Families	23
Genera	44
Taxa (species, subspecies, varieties)	104
Native Taxa	104
Introduced Taxa	0
Threatened Flora	0
Priority Flora	0
Range Extensions	0
Speciose Families	**No. Taxa**
Chenopodiaceae	22
Fabaceae	19
Scrophulariaceae	14
Myrtaceae	8
Poaceae	5
Lamiaceae	4
Loranthaceae	4
Sapindaceae	4
Speciose Genera	**No. Taxa**
Eremophila	14
Acacia	13
Maireana	9
Eucalyptus	8
Sclerolaena	5
Senna	4
Atriplex	3



ONSHORE ENVIRONMENTAL

MOHO RESOURCES

East Samson Dam Project

TEC/PEC Location

Legend

- Study Area

TEC/PEC Locations

- Emu Land System

N

0 1 2 3 4 5

Kilometers
1:250,000
Datum: GDA94
Projection: MGA Zone 51

Date:	03/12/2019
Status:	Draft
Figure:	7
Sheet Size:	A3
Internal Reference:	MR_Pec_Tec
Drawn by:	GSM
Requested by:	DB

GRIFFIN SPATIAL & MAPPING

3.3 Significant Flora

3.3.1 Threatened Flora listed under the BC Act and EPBC Act

None of the plant taxa recorded from the study area were gazetted as Threatened Flora (T) under the BC Act, or listed under the EPBC Act.

3.3.2 Significant Flora

None of the plant taxa recorded from the study area was listed as a Priority flora taxon by DBCA.

3.3.3 Range Extensions

None of the plant taxa recorded from the study area was considered to represent a significant range extension from the current known distributions.

3.4 Introduced Flora

There were no introduced species recorded from the study area.

3.5 Vegetation Condition

Vegetation condition within the study area ranged from *excellent* to *good* (Figure 8, Table 11) with recorded disturbances including mine exploration, sandalwood cutting, and historical grazing by sheep. Vegetation condition across the largest proportion of the study area was rated as *excellent* or *very good* (97% of the study area), with approximately 3% (6 ha) rated as *good*.

Table 11 Vegetation condition within the study area.

Condition	Area (ha)	% of Total
Excellent	89.45	48.5
Very Good	88.95	48.3
Good	5.92	3.2
Total	184.32	100.00

3.6 Vegetation

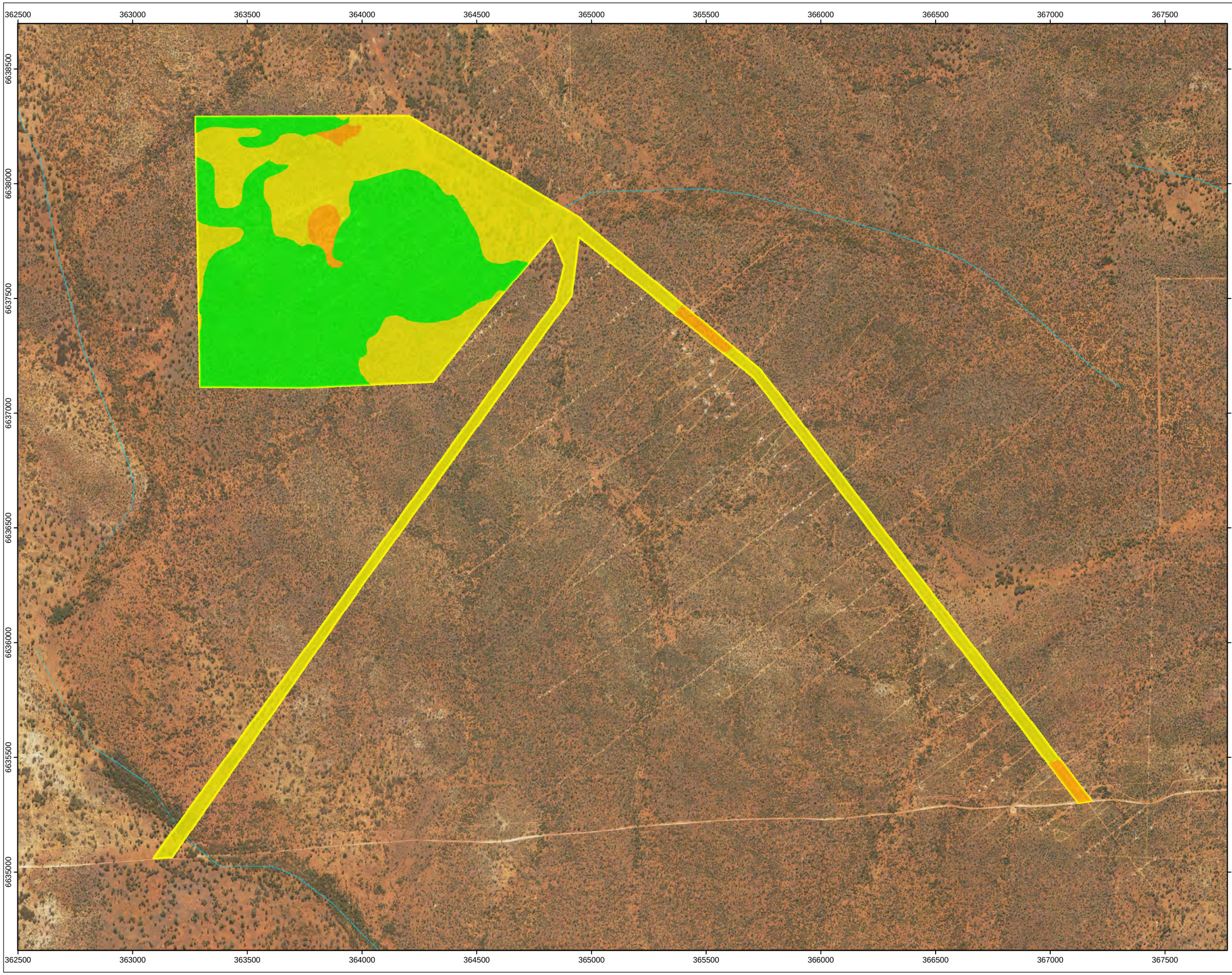
A total of 12 vegetation associations classified as nine broad floristic formations and occurring on five broad landforms were described and mapped from the study area (Figure 9, Table 12). A species by site matrix and raw data for the 30 study sites is presented in Appendices 10 and 11 respectively. The latest EPA technical guidelines (EPA 2016a) recommend that a minimum of three quadrats should be sampled in each vegetation unit. Due to the relatively small size of the study area and fine scale vegetation mapping completed, three vegetation associations were sampled with two quadrats, and three vegetation associations were sampled with a single quadrat; where less than three quadrats were assessed, the entire vegetation unit was intensively ground trothed to record new plant taxa and undertake targeted searches for significant flora taxa.

None of the vegetation associations described and mapped from the study area were found to be aligned with any TECs or PECs documented from the Goldfields or Murchison.

Table 12 Vegetation associations mapped within the study area.

Code	Broad Floristic Formation	Vegetation Description	Quadrats	Area (ha)	% of Study Area
		Hill Crests			
HC SafDlAk DlSsWr Cp	Senna Low Scrub A	Low Scrub A of Senna artemisioides subsp. filifolia, Dodonaea lobulata and Acacia kalgoorliensis over Dwarf Scrub C of Dodonaea lobulata, Scaevola spinescens and Westringia rigida with Open Low Woodland A of Casuarina pauper over Open Scrub of Acacia duriuscula, Acacia burkittii and Santalum spicatum on orange sandy loams on hill crests, upper hill slopes and low stony rises	ES02, ES06, ES12, ES15, ES29, ES30	28.16	15.3
		Stony Plains			
SP AdAbAt El Cp	Acacia Scrub	Scrub of Acacia duriuscula, Acacia burkittii and Acacia tetragonophylla with Very Open Tree Mallee of Eucalyptus longissima over Open Low Woodland A of Casuarina pauper over Open Low Scrub A of Scaevola spinescens, Dodonaea lobulata and Senna artemisioides subsp. filifolia on orange silty loam on stony plains	ES16, ES17, ES26	7.39	4.0
SP AdDlSaf Cp AdAmAt	Acacia Low Scrub A	Low Scrub A of Acacia duriuscula, Dodonaea lobulata and Senna artemisioides subsp. filifolia with Open Low Woodland A of Casuarina pauper over Open Scrub of Acacia duriuscula, Acacia ?incurvaneura x mulganeura and Acacia tetragonophylla over Open Dwarf Scrub C of Scaevola spinescens, Ptilotus obovatus and Eremophila granitica on red silty loam on stony plains	ES07, ES09, ES28	72.82	39.5
SP AiAdAmgc Cp SafSsAh	Acacia Scrub	Scrub of Acacia incurvaneura, Acacia duriuscula and Acacia ?incurvaneura x mulganeura with Open Low Woodland A of Casuarina pauper over Open Low Scrub A of Senna artemisioides subsp. filifolia, Scaevola spinescens and Acacia hemiteles over Open Dwarf Scrub C of Dodonaea lobulata, Scaevola spinescens and Ptilotus obovatus on brown silty loams on stony plains	ES27	1.35	0.7
SP ElEc Cp AdAbAi	Eucalyptus Open Tree Mallee	Open Tree Mallee of Eucalyptus longissima and Eucalyptus concinna over Open Low Woodland A of Casuarina pauper over Open Scrub of Acacia duriuscula, Acacia burkittii and Acacia incurvaneura over Open Low Scrub A of Senna artemisioides subsp. filifolia, Eremophila granitica and Dodonaea lobulata over Open Dwarf Scrub D of Ptilotus obovatus on brown silty loam on stony plains	ES05, ES13	14.42	7.8
SP EsEt Es SafSs	Eucalyptus Woodland	Woodland of Eucalyptus salmonophloia (with Eucalyptus transcontinentalis) over Open Scrub of Eremophila scoparia over Open Low Scrub A of Senna artemisioides subsp. filifolia and Senna stowardii over Open Dwarf Scrub D of Sclerolaena diacantha, Maireana triptera and Maireana tomentosa on red brown silty clay loam on stony plains	ES01, ES10, ES20	30.65	16.6
SP EtEl Cp SafEs	Eucalyptus Open Woodland	Open Woodland of Eucalyptus transcontinentalis and Eucalyptus lesouefii over Open Low Woodland A of Casuarina pauper over Open Low Scrub A of Senna artemisioides subsp. filifolia and Eremophila scoparia over Open Dwarf Scrub D of Eremophila parvifolia subsp. auricampa, Ptilotus obovatus and Maireana trichoptera on red sandy clay loam on stony plains	ES24, ES25	9.29	5.0

Code	Broad Floristic Formation	Vegetation Description	Quadrats	Area (ha)	% of Study Area
		Hardpan Plains			
HP AmAmgccGn AbAdAt SafPs	Acacia Thicket	Thicket of Acacia mulganeura, Acacia ?incurvaneura x mulganeura and Grevillea nematophylla subsp. nematophylla over Scrub of Acacia burkittii, Acacia duriuscula and Acacia tetragonophylla over Open Low Scrub A of Senna artemisioides subsp. filifolia and Psydrax suaveolens on red sandy clay loam on hardpan plains	ES08, ES19, ES23	8.58	4.7
HP EsEcEl SafErgbAh EiEs	Eucalyptus Open Tree Mallee	Open Tree Mallee of Eucalyptus salubris, Eucalyptus concinna and Eucalyptus lesouefii over Low Scrub A of Senna artemisioides subsp. filifolia, Eremophila pantonii and Acacia hemiteles with Open Scrub of Eremophila interstans subsp. interstans and Eremophila scoparia over Open Dwarf Scrub D of Atriplex vesicaria, Sclerolaena diacantha and Maireana trichoptera on brown silty clay loam on hardpan plains	ES14	1.61	0.9
		Floodplains			
FP ElEc AmgcAdAi SafSaaDl	Eucalyptus Open Tree Mallee	Open Tree Mallee of Eucalyptus longissima and Eucalyptus concinna over Scrub of Acacia ?incurvaneura x mulganeura, Acacia duriuscula and Acacia incurvaneura over Open Low Scrub A of Senna artemisioides subsp. filifolia, Senna artemisioides subsp. x artemisioides and Dodonaea lobulata over Open Dwarf Scrub D of Ptilotus obovatus on red sandy clay loams on floodplains	ES03, ES04, ES18	7.07	3.8
FP EsEc AbAaAt SafAh	Eucalyptus Tree Mallee	Tree Mallee of Eucalyptus salubris and Eucalyptus concinna over Thicket of Acacia burkittii, Acacia aptaneura and Acacia tetragonophylla over Open Low Scrub A of Senna artemisioides subsp. filifolia and Acacia hemiteles on red sandy clay loam on floodplains	ES12	0.74	0.4
		Gilgai Plains			
GP Es Es AvMpEmb	Eucalyptus Low Woodland	Low Woodland A of Eucalyptus salubris over Low Scrub A of Eremophila scoparia over Open Dwarf Scrub C of Atriplex vesicaria, Maireana pyramidata and Eremophila maculata subsp. brevifolia over Open Dwarf Scrub D of Sclerolaena diacantha, Maireana trichoptera and Enchylaena tomentosa var. tomentosa on red silty clay loam on gilgai plains	ES11, ES22	2.24	1.2



ONSHORE ENVIRONMENTAL

MOHO RESOURCES

East Samson Dam Project

Vegetation Condition

Legend

- Study Area

Vegetation Condition

- Good
- Very Good
- Excellent

N

0 100 200 300 400 500

Meters
1:15,000
Datum: GDA94
Projection: MGA Zone 51

Date:	03/12/2019
Status:	Draft
Figure:	8
Sheet Size:	A3
Internal Reference:	MR_Veg_cond
Drawn by:	GSM
Requested by:	DB

GRIFFIN SPATIAL & MAPPING

Legend

Study Area

Vegetation Types

Hill Crest

HC SafDlAk DlSsWr Cp (VU6) — Low Scrub A of Senna artemisioides subsp. filifolia, Dodonaea lobulata and Acacia kalgoorliensis over Dwarf Scrub C of Dodonaea lobulata, Scaevola spinescens and Westringia rigida with Open Low Woodland A of Casuarina pauper over Open Scrub of Acacia duriuscula, Acacia burkittii and Santalum spicatum on orange sandy loams on hill crests, upper hill slopes and low stony rises

Stony Plains

SP AdAbAt El Cp (VU 12) — Scrub of Acacia duriuscula, Acacia burkittii and Acacia tetragonophylla with Very Open Tree Mallee of Eucalyptus longissima over Open Low Woodland A of Casuarina pauper over Open Low Scrub A of Scaevola spinescens, Dodonaea lobulata and Senna artemisioides subsp. filifolia on orange silty loam on stony plains

SP AdDlSaf Cp AdAmAt (VU 2) — Low Scrub A of Acacia duriuscula, Dodonaea lobulata and Senna artemisioides subsp. filifolia with Open Low Woodland A of Casuarina pauper over Open Scrub of Acacia duriuscula, Acacia ?incurvaneura x mulganeura and Acacia tetragonophylla over Open Dwarf Scrub C of Scaevola spinescens, Ptilotus obovatus and Eremophila granitica on red silty loam on stony plains

SP AiAdAmgc Cp SafSsAh (VU 3) — Scrub of Acacia incurvaneura, Acacia duriuscula and Acacia ?incurvaneura x mulganeura with Open Low Woodland A of Casuarina pauper over Open Low Scrub A of Senna artemisioides subsp. filifolia, Scaevola spinescens and Acacia hemiteles over Open Dwarf Scrub C of Dodonaea lobulata, Scaevola spinescens and Ptilotus obovatus on brown silty loams on stony plains

SP ElEc Cp AdAbAi (VU 5) — Open Tree Mallee of Eucalyptus longissima and Eucalyptus concinna over Open Low Woodland A of Casuarina pauper over Open Scrub of Acacia duriuscula, Acacia burkittii and Acacia incurvaneura over Open Low Scrub A of Senna artemisioides subsp. filifolia, Eremophila granitica and Dodonaea lobulata over Open Dwarf Scrub D of Ptilotus obovatus on brown silty loam on stony plains

SP EsEt Es SafSs (VU 1) — Woodland of Eucalyptus salmonophloia (with Eucalyptus transcontinentalis) over Open Scrub of Eremophila scoparia over Open Low Scrub A of Senna artemisioides subsp. filifolia and Senna stowardii over Open Dwarf Scrub D of Sclerolaena diacantha, Maireana triptera and Maireana tomentosa on red brown silty clay loam on stony plains

SP EtEl Cp SafEs (VU11) — Open Woodland of Eucalyptus transcontinentalis and Eucalyptus lesouefii over Open Low Woodland A of Casuarina pauper over Open Low Scrub A of Senna artemisioides subsp. filifolia and Eremophila scoparia over Open Dwarf Scrub D of Eremophila parvifolia subsp. auricampa, Ptilotus obovatus and Maireana trichoptera on red sandy clay loam on stony plains

Gilgai Plain

GP Es Es AvMpEmb (VU 8) — Low Woodland A of Eucalyptus salubris over Low Scrub A of Eremophila scoparia over Open Dwarf Scrub C of Atriplex vesicaria, Maireana pyramidata and Eremophila maculata subsp. brevifolia over Open Dwarf Scrub D of Sclerolaena diacantha, Maireana trichoptera and Enchylaena tomentosa var. tomentosa on red silty clay loam on gilgai plains

Hardpan Plains

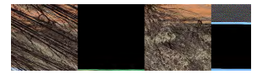
HP AmAmgccGn AbAdAt SafPs (VU 7) — Thicket of Acacia mulganeura, Acacia ?incurvaneura x mulganeura and Grevillea nematophylla subsp. nematophylla over Scrub of Acacia burkittii, Acacia duriuscula and Acacia tetragonophylla over Open Low Scrub A of Senna artemisioides subsp. filifolia and Psydrax suaveolens on red sandy clay loam on hardpan plains

HP EsEcEl SafErgbAh EiEs (VU 10) — Open Tree Mallee of Eucalyptus salubris, Eucalyptus concinna and Eucalyptus lesouefii over Low Scrub A of Senna artemisioides subsp. filifolia, Eremophila pantonii and Acacia hemiteles with Open Scrub of Eremophila interstans subsp. interstans and Eremophila scoparia over Open Dwarf Scrub D of Atriplex vesicaria, Sclerolaena diacantha and Maireana trichoptera on brown silty clay loam on hardpan plains

Flood Plain

FP ElEc AmgcAdAi SafSaaDl (VU 4) — Open Tree Mallee of Eucalyptus longissima and Eucalyptus concinna over Scrub of Acacia ?incurvaneura x mulganeura, Acacia duriuscula and Acacia incurvaneura over Open Low Scrub A of Senna artemisioides subsp. filifolia, Senna artemisioides subsp. x artemisioides and Dodonaea lobulata over Open Dwarf Scrub D of Ptilotus obovatus on red sandy clay loams on floodplains

FP EsEc AbAaAt SafAh (VU 9) — Tree Mallee of Eucalyptus salubris and Eucalyptus concinna over Thicket of Acacia burkittii, Acacia aptaneura and Acacia tetragonophylla over Open Low Scrub A of Senna artemisioides subsp. filifolia and Acacia hemiteles on red sandy clay loam on floodplains



MOHO RESOURCES

East Samson Dam Project

Vegetation Types Legend

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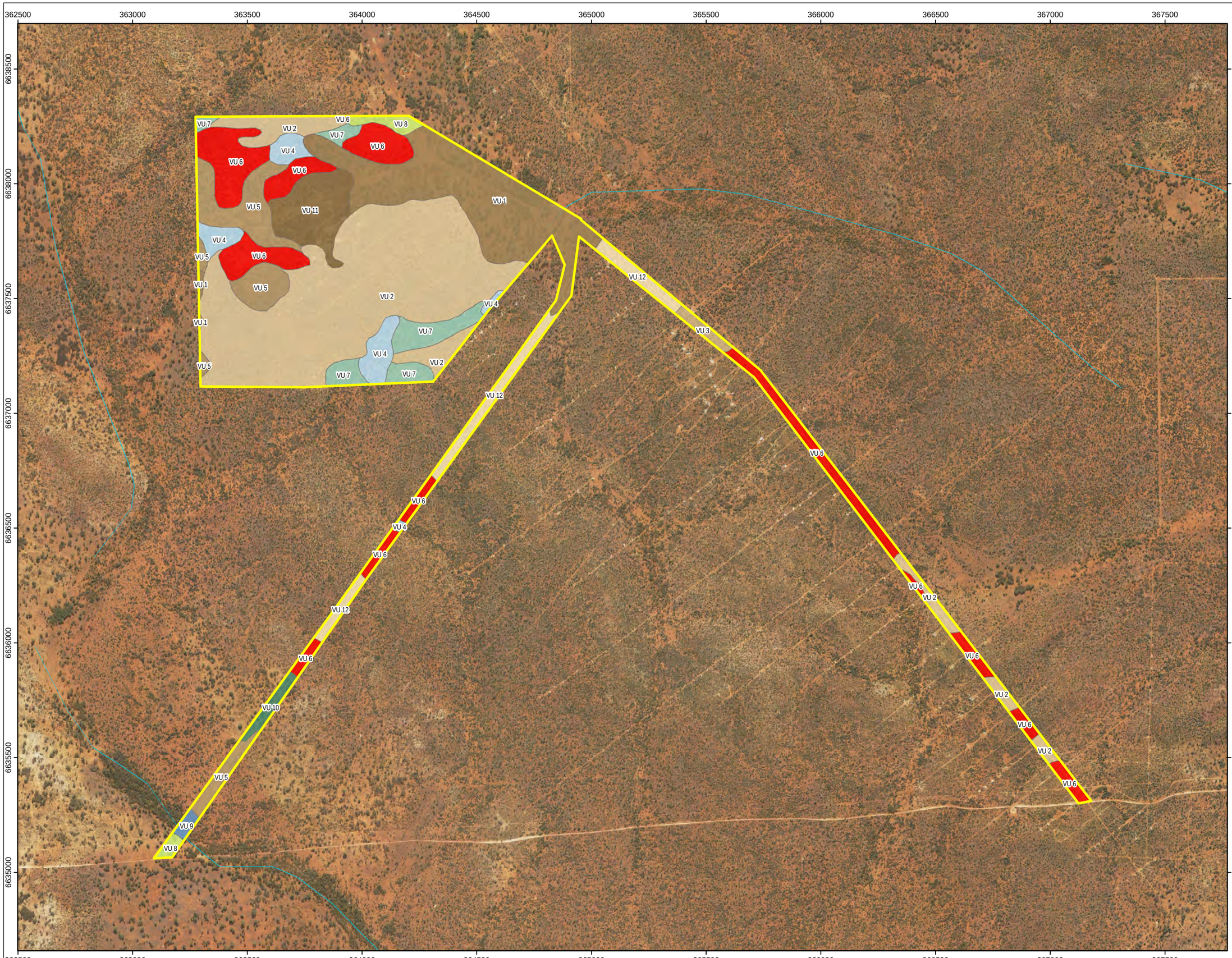


MOHO RESOURCES

East Samson Dam Project

Vegetation Types

Legend

Study Area

N

0 100 200 300 400 500

Meters
1:15,000
Datum: GDA94
Projection: MGA Zone 51

Date:	03/12/2019
Status:	Draft
Figure:	9
Sheet Size:	A3
Internal Reference:	MR_Veg_types
Drawn by:	GSM
Requested by:	DB

Code	HC SafDlAk DlSsWr Cp
Broad Floristic Formation	Senna Low Scrub A
Vegetation Association	Low Scrub A of Senna artemisioides subsp. filifolia, Dodonaea lobulata and Acacia kalgoorliensis over Dwarf Scrub C of Dodonaea lobulata, Scaevola spinescens and Westringia rigida with Open Low Woodland A of Casuarina pauper over Open Scrub of Acacia duriuscula, Acacia burkittii and Santalum spicatum on orange sandy loams on hill crests, upper hill slopes and low stony rises

Quadrats Sampled	ES02, ES06, ES12, ES15, ES29, ES30
Soils and Geology	Orange sandy loams; ill crests, upper hill slopes and low stony rises
Land Form	Hill crests, upper hill slopes and low stony rises
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	None
Vegetation Condition	Very Good to Excellent
Disturbances	Mining exploration
Average Fire Age	Old (6+ years)

Code	SP AdAbAt El Cp
Broad Floristic Formation	Acacia Scrub
Vegetation Association	Scrub of Acacia duriuscula, Acacia burkittii and Acacia tetragonophylla with Very Open Tree Mallee of Eucalyptus longissima over Open Low Woodland A of Casuarina pauper over Open Low Scrub A of Scaevola spinescens, Dodonaea lobulata and Senna artemisioides subsp. filifolia on orange silty loam on stony plains

Quadrats Sampled	ES16, ES17, ES26
Soils and Geology	Orange silty loam
Land Form	Stony plains
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	None
Vegetation Condition	Very Good to Excellent
Disturbances	Mining exploration, grazing, access tracks
Average Fire Age	Old (6+ years)

Code	SP AdDlSaf Cp AdAmAt
Broad Floristic Formation	Acacia Low Scrub A
Vegetation Association	Low Scrub A of Acacia duriuscula, Dodonaea lobulata and Senna artemisioides subsp. filifolia with Open Low Woodland A of Casuarina pauper over Open Scrub of Acacia duriuscula, Acacia ?incurvaneura x mulganeura and Acacia tetragonophylla over Open Dwarf Scrub C of Scaevola spinescens, Ptilotus obovatus and Eremophila granitica on red silty loam on stony plains

Quadrats Sampled	ES07, ES09, ES28
Soils and Geology	Red silty loams
Land Form	Stony plains
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	None
Vegetation Condition	Very Good
Disturbances	Pastotal access track
Average Fire Age	Old (6+ years)

Code	SP AiAdAmgc Cp SafSsAh
Broad Floristic Formation	Acacia Scrub
Vegetation Association	Scrub of Acacia incurvaneura, Acacia duriuscula and Acacia ?incurvaneura x mulganeura with Open Low Woodland A of Casuarina pauper over Open Low Scrub A of Senna artemisioides subsp. filifolia, Scaevola spinescens and Acacia hemiteles over Open Dwarf Scrub C of Dodonaea lobulata, Scaevola spinescens and Ptilotus obovatus on brown silty loams on stony plains

Quadrats Sampled	ES27
Soils and Geology	Brown silty loams
Land Form	Stony plains
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	None
Vegetation Condition	Excellent to Very Good
Disturbances	Mine exploration (parts intensively drilled), access track
Average Fire Age	Old (6+ years)

Code	SP ElEc Cp AdAbAi
Broad Floristic Formation	Eucalyptus Open Tree Mallee
Vegetation Association	Open Tree Mallee of Eucalyptus longissima and Eucalyptus concinna over Open Low Woodland A of Casuarina pauper over Open Scrub of Acacia duriuscula, Acacia burkittii and Acacia incurvaneura over Open Low Scrub A of Senna artemisioides subsp. filifolia, Eremophila granitica and Dodonaea lobulata over Open Dwarf Scrub D of Ptilotus obovatus on brown silty loam on stony plains

Quadrats Sampled	ES05, ES13
Soils and Geology	Brown silty loam
Land Form	Stony plains
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	None
Vegetation Condition	Excellent to Very Good
Disturbances	Mine exploration, access tracks
Average Fire Age	Old (6+ years)

Code	SP EsEt Es SafSs
Broad Floristic Formation	Eucalyptus Woodland
Vegetation Association	Woodland of Eucalyptus salmonophloia (with Eucalyptus transcontinentalis) over Open Scrub of Eremophila scoparia over Open Low Scrub A of Senna artemisioides subsp. filifolia and Senna stowardii over Open Dwarf Scrub D of Sclerolaena diacantha, Maireana triptera and Maireana tomentosa on red brown silty clay loam on stony plains

Quadrats Sampled	ES01, ES10, ES20
Soils and Geology	Red brown silty clay loams
Land Form	Stony plains
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	None
Vegetation Condition	Excellent to Very Good
Disturbances	Access tracks, historical sandalwood cutting
Average Fire Age	Old (6+ years)

Code	SP EtEl Cp SafEs
Broad Floristic Formation	Eucalyptus Open Woodland
Vegetation Association	Open Woodland of Eucalyptus transcontinentalis and Eucalyptus lesouefii over Open Low Woodland A of Casuarina pauper over Open Low Scrub A of Senna artemisioides subsp. filifolia and Eremophila scoparia over Open Dwarf Scrub D of Eremophila parvifolia subsp. auricampa, Ptilotus obovatus and Maireana trichoptera on red sandy clay loam on stony plains

Quadrats Sampled	ES24, ES25
Soils and Geology	Red sandy clay loam
Land Form	Stony plains
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	None
Vegetation Condition	Good to Very Good
Disturbances	Mine exploration (heavily drilled), access tracks
Average Fire Age	Old (6+ years)

Code	HP AmAmgccGn AbAdAt SafPs
Broad Floristic Formation	Acacia Th*icket*
Vegetation Association	Thicket of Acacia mulganeura, Acacia ?incurvaneura x mulganeura and Grevillea nematophylla subsp. nematophylla over Scrub of Acacia burkittii, Acacia duriuscula and Acacia tetragonophylla over Open Low Scrub A of Senna artemisioides subsp. filifolia and Psydrax suaveolens on red sandy clay loam on hardpan plains

Quadrats Sampled	ES08, ES19, ES23
Soils and Geology	Red sandy clay loam
Land Form	Hardpan plains
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	None
Vegetation Condition	Excellent to Very Good
Disturbances	Access track
Average Fire Age	Old (6+ years)

Code	HP EsEcEl SafErgbAh EiEs
Broad Floristic Formation	Eucalyptus Open Tree Mallee
Vegetation Association	Open Tree Mallee of Eucalyptus salubris, Eucalyptus concinna and Eucalyptus lesouefii over Low Scrub A of Senna artemisioides subsp. filifolia, Eremophila pantonii and Acacia hemiteles with Open Scrub of Eremophila interstans subsp. interstans and Eremophila scoparia over Open Dwarf Scrub D of Atriplex vesicaria, Sclerolaena diacantha and Maireana trichoptera on brown silty clay loam on hardpan plains

Quadrats Sampled	ES14
Soils and Geology	Brown silty clay loam
Land Form	Hardpan plains
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	None
Vegetation Condition	Very Good
Disturbances	Mine exploration
Average Fire Age	Old (6+ years)

Code	FP EIEc AmgcAdAi SafSaaDl
Broad Floristic Formation	Eucalyptus Open Tree Mallee
Vegetation Association	Open Tree Mallee of Eucalyptus longissima and Eucalyptus concinna over Scrub of Acacia ?incurvaneura x mulganeura, Acacia duriuscula and Acacia incurvaneura over Open Low Scrub A of Senna artemisioides subsp. filifolia, Senna artemisioides subsp. x artemisioides and Dodonaea lobulata over Open Dwarf Scrub D of Ptilotus obovatus on red sandy clay loams on floodplains

Quadrats Sampled	ES03, ES04, ES18
Soils and Geology	Red sandy clay loams
Land Form	Drainage Area / Floodplain
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	None
Vegetation Condition	Excellent to Very Good
Disturbances	Access track
Average Fire Age	Old (6+ years)

Code	FP EsEc AbAaAt SafAh
Broad Floristic Formation	Eucalyptus Tree Mallee
Vegetation Association	Tree Mallee of Eucalyptus salubris and Eucalyptus concinna over Thicket of Acacia burkittii, Acacia aptaneura and Acacia tetragonophylla over Open Low Scrub A of Senna artemisioides subsp. filifolia and Acacia hemiteles on red sandy clay loam on floodplains

Quadrats Sampled	ES12
Soils and Geology	Red sandy clay loam
Land Form	Drainage Area / Floodplain
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	None
Vegetation Condition	Very Good
Disturbances	Access track, fenceline
Average Fire Age	Old (6+ years)

Code	GP Es Es AvMpEmb
Broad Floristic Formation	Eucalyptus Low Woodland
Vegetation Association	Low Woodland A of Eucalyptus salubris over Low Scrub A of Eremophila scoparia over Open Dwarf Scrub C of Atriplex vesicaria, Maireana pyramidata and Eremophila maculata subsp. brevifolia over Open Dwarf Scrub D of Sclerolaena diacantha, Maireana trichoptera and Enchylaena tomentosa var. tomentosa on red silty clay loam on gilgai plains

Quadrats Sampled	ES11, ES22
Soils and Geology	Red silty clay loam
Land Form	Gilgai plain, drainage zones
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	None
Vegetation Condition	Very Good
Disturbances	Access tracks
Average Fire Age	Old (6+ years)

3.7 Representation and Reservation of Vegetation

To assess the representation of vegetation within the study area, regional mapping completed by Beard (1978) was utilised. A single Beard vegetation association was represented within the study area (Table 13). In terms of representation, the Western Australian Government is committed to the National Objectives Targets for Biodiversity Conservation which includes a target that prevents clearance of ecological communities with an extent below 30% of that present pre-European settlement (Department of Natural Resources and Environment 2002, EPA 2000).

When considering representation at the State level, the Beard association represented within the study area currently has 99.80% of the pre-European extent remaining (Government of Western Australia 2018). The study area is located within the Murchison bioregion, specifically within the Eastern Murchison subregion (as discussed in Section 1.3). When considering the representation of vegetation at the IBRA regional level and IBRA system level, 99.78% of the pre-European extent remains for the vegetation association represented (Table 13). The study area falls entirely within the City of Kalgoorlie-Boulder. At this local level 99.71% of the pre-European extent remains for the vegetation association represented (Table 13). Vegetation within the study area is therefore determined to be well represented at all levels (statewide, bioregional [IBRA region and IBRA sub-region] and local), with greater than 99.71% of the pre-European extent remaining for the Beard vegetation association represented.

In terms of reservation, there is a benchmark for a minimum of 15% of each Beard vegetation association to be protected in Class I-IV reserves (Commonwealth of Australia 1997). Across all levels, the proportion of the sole vegetation association occurring within secure reserves ranges from 13.3% at the state level, 8.9% at the bioregional level, and 6.7% at the local level (Table 13). However, given that the proposed development will not significantly reduce the pre-European extent of the Beard vegetation association represented within the study area (i.e. will remain well above the 30% threshold within the bioregion), the reservation status is determined to be of least concern for biodiversity conservation.

Table 13 Pre-European extent of vegetation represented on the basis of identified datasets.

Vegetation System / Association	Pre-European Extent (ha)	Current Extent (ha)	% Pre-European Extent Remaining	Current Extent in Class I-IV Reserves (ha)	% Current Extent in Class I-IV Reserves	Current Extent DBCA Managed Lands (ha)	% Current Extent DBCA Managed Lands
Beard Vegetation Association							
20 Low woodland; mulga mixed with Allocasuarina cristata & Eucalyptus sp.	1,295,103	1,292,474	99.80	172,475	13.34	250,980	19.42
Beard Vegetation System							
20.2 Barlee	1,175,571	1,172,943	99.78	104,614	8.90	183,118	15.61
IBRA Region							
Murchison 20	1,174,259	1,171,630	99.78	104,409	8.89	181,853	15.52
IBRA Sub-Region							
Eastern Murchison (MUR01) 20	1,174,259	1,171,630	99.78	104,409	8.89	181,853	15.52
Local Government							
City of Kalgoorlie-Boulder 20	728,313	726,233	99.71	49,000	6.73	62,077	8.55

3.8 Conservation Significance of Vegetation

3.8.1 National Significance

None of the 12 vegetation associations recorded from the study area support Threatened Flora listed under the EPBC Act or are aligned with any federal listed TECs. Therefore vegetation within the study area is not considered to be of national significance.

3.8.2 State Significance

None of the 12 vegetation associations recorded from the study area support Threatened Flora listed under the BC Act or are aligned with any state listed TECs or PECs. Similarly, none of the vegetation associations support Priority flora listed by the DBCA. Therefore vegetation within the study area is not considered to be of state significance.

3.8.3 Local Significance

None of the 104 plant taxa recorded within the study area were considered to represent significant range extensions from their current known distributions. Therefore, vegetation was determined not to be of local conservation significance.

3.9 Vertebrate Fauna Species

A list of vertebrate fauna species recorded during the field survey is provided in Appendix 12.

3.9.1 Threatened Fauna listed under the BC Act and EPBC Act

One vertebrate fauna species, the Malleefowl (*Leipoa ocellata*), listed as a Scheduled species under the BC Act and listed as Vulnerable under the EPBC Act was recorded from the study area. A second species also listed under the BC Act, Pregrine Falcon (*Falco peregrinus)*, was identified as having the potential to utilise the study area.

Malleefowl *(Leipoa ocellata)*

During the field survey a recently active Malleefowl nest mound was identified (Figure 10). This nest was not currently being used but had a clear structure and was likely to have been used in recent breeding seasons.

Plate 1 Malleefowl nest mound recorded within the study area.

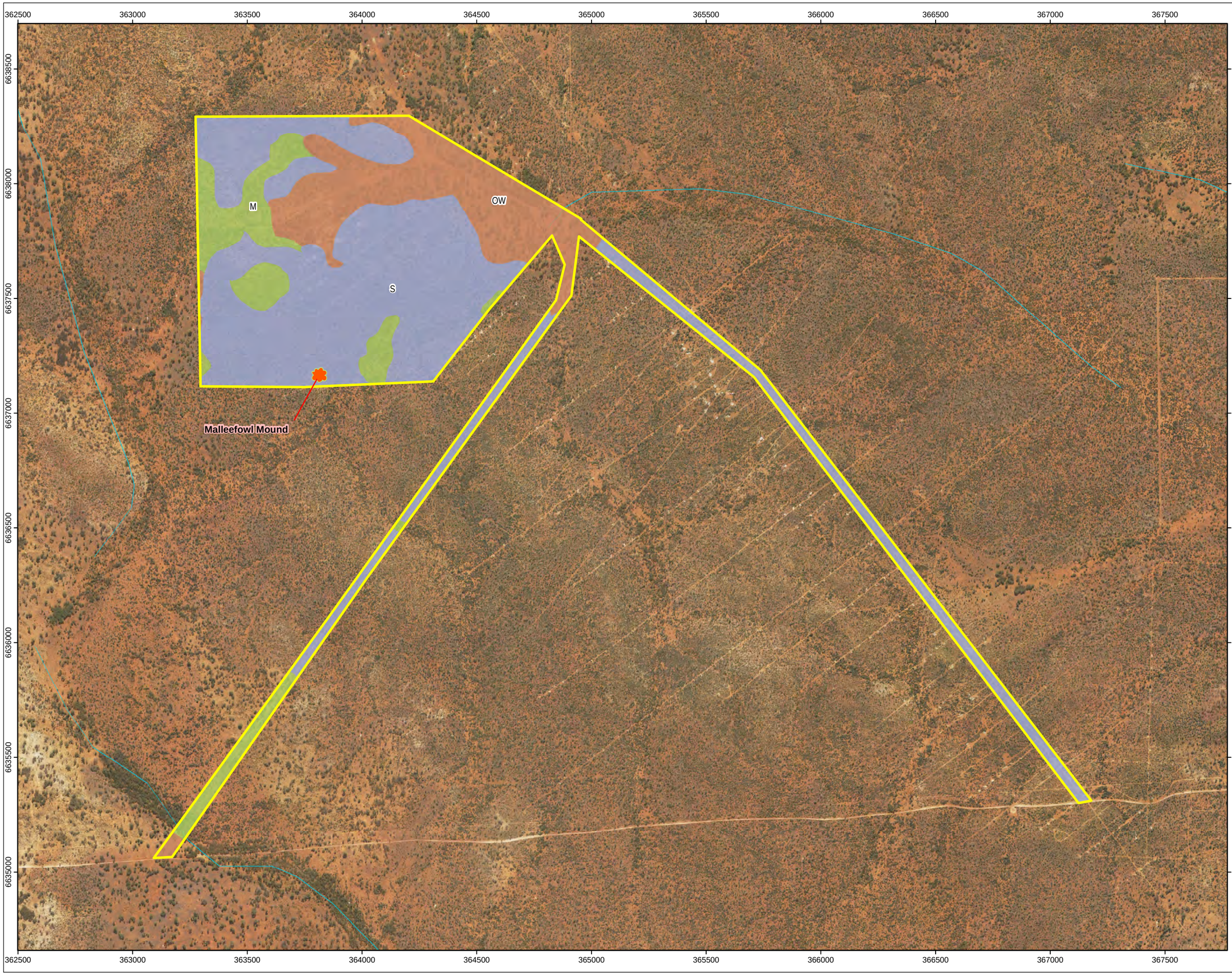
The Malleefowl listed as a Vulnerable species under the EPBC Act and under the IUCN, and as a Schedule 3 species under the BC Act. Malleefowl are large, ground-dwelling birds approximately the size of a domestic chicken, with adults weighing between 1.5 and 2.5 kg. They are found in arid and semi-arid areas dominated by mallee eucalypts on sandy soils. They are also known to occur in Mulga *(Acacia aneura),* Broombush *(Melaleuca uncinata),* Scrub Pine *(Callitris verrucosa), Eucalyptus* woodlands and coastal heathlands (DPaW 2016). Malleefowl require abundant leaf litter and a sandy substrate for the successful construction of nest mounds. With nests comprising of a large mound of soil covering a central core of leaf litter that can span up to 5 m in diameter and 1 m in height.

In Western Australia, malleefowl are most commonly seen within and around the Wheatbelt region, and more recently have been recorded from the Goldfields region. In proximity to the Barlee Gold Project, the Malleefowl is known from the Mount Manning Range Nature Reserve. Historically, Malleefowl occurred more widely including the south-west of Western Australia, however the species range has been highly fragmented due to land clearing (DPaW 2016).

Peregrine Falcon (*Falco peregrinus)*

The Peregrine Falcon is a widespread bird of prey that is known to have a very large range. The population of this species is considered to be relatively stable in Western Australia but may be impacted at a local level due to human activities (Debus 1998). The Peregrine Falcon likes to nest on ledges on cliff faces, and occasionally in large trees (Johnstone and Storr 1998).

Suitable breeding habitat for this species was not present within the study area, however as it is widespread and highly mobile it is possible that this species could occasionally use the study area when foraging for food.



MOHO RESOURCES

East Samson Dam Project

Fauna Habitat Types

Legend

- Study Area
- Malleefowl Mound Location

Fauna Habitat

- Mallee
- Open Woodland
- Shrubland

N

0 100 200 300 400 500

Meters
1:15,000
Datum: GDA94
Projection: MGA Zone 51

Date:	03/12/2019
Status:	Draft
Figure:	10
Sheet Size:	A3
Internal Reference:	MR_Fau_hab
Drawn by:	GSM
Requested by:	DB

3.9.2 Priority Fauna recognised by the DBCA

No Priority fauna species, as recognised by the DBCA, were recorded from the study area.

3.9.3 Introduced Fauna Species

No introduced fauna species (feral animals) were observed within the study area during the survey.

3.10 Fauna Habitats

Three broad fauna habitats were mapped within the study area on the basis of vegetation, landforms and microhabitat availability for fauna species (Figure 10):

1. Mallee Woodland
2. Open Woodland
3. Shrubland

1. MALLEE WOODLAND

Mallee Woodland habitat is relatively common within the study area and is characterised by species of mallee forming vegetation comprised of *Eucalyptus salubris, E. concinna,* and *E. lesouefii* over shrublands (Plate 2). As the mallee trees are relatively small in diameter, this habitat generally lacks tree hollows. The understorey can be dense and provides suitable habitats for numerous species, including the conservation significant Malleefowl (*Leipoa ocellata*).

Plate 2 Mallee Woodland Habitat

2. OPEN WOODLAND

The Open Woodland habitat is less common than mallee-dominated areas of the Goldfields. This habitat is predominantly located on the north eastern edge of the study area and is characterised by *Eucalyptus salmonophloia*, *E. transcontinentalis* and *E. lesouefii* species (Plate 3). Open Woodland habitat has the potential to provide microhabitats like tree hollows and logs, which can be suitable for species like the Chuditch (*Dasyurus geoffroii*) and Western Spiney-tailed Skink (*Egernia stokesii badia*).

However, the Open Woodland habitat within the study area had a very open understorey and few suitable hollows were detected.

Plate 3 Open Woodland Habitat

3. SHRUBLAND

The Shrubland habitat is the most widespread of the habitats, occurring throughout most of the study area. This habitat is characterised by species of *Acacia* including *A. mulganeura* and *A. duriuscula,* as well as *Dodonaea species* (Plate 4). This habitat lacks larger trees and mallee, but the dense structure of the vegetation provides shelter and nesting habitat for ground dwelling birds, including the Malleefowl *(Leipoa ocellata).*

Plate 4 Shrubland Habitat

4.0 SUMMARY

The detailed flora and vegetation survey of Moho Resources East Samson Dam Project was completed under fair seasonal conditions in October 2019 by a Principal Botanist with over 15 years' experience working in the region.

A total number of 104 plant taxa from 23 families and 44 genera was recorded from the study area. Species representation was greatest among the Chenopodiaceae, Fabaceae, Scrophulariaceae and Myrtaceae families. The most speciose genus was *Eremophila* (14 taxa), followed by *Acacia* (13 taxa), followed by *Maireana* (9 taxa), *Eucalyptus* (8 taxa) and *Sclerolaena* (5 taxa).

None of the plant taxa recorded from the study area were gazetted as Threatened Flora pursuant to the BC Act or listed under the EPBC Act. Additionally, none of the taxa were listed as Priority flora taxa by the DBCA, and none were considered to represent a significant range extension from their current known distributions.

There were no introduced species (weeds) recorded from the study area at October 2019.

A total of 12 vegetation associations classified as nine broad floristic formations and occurring on five broad landforms were described and mapped from the study area. None of the vegetation associations were aligned with federal or state listed Threatened Ecological Communities (TECs) or state listed Priority Ecological Communities (PECs), and all were well represented at the state, bioregional and local levels.

Vegetation condition within the study area ranged from *excellent* to *good* with the largest proportion of the study area rated as *excellent* or *very good* (97% of the study area). Disturbances recorded within the study area included mine exploration, sandalwood cutting, and historical grazing by sheep.

Evidence of one conservation significant fauna species was recorded in the study area, a single nest mound belonging to the Malleefowl *(Leipoa ocellata).* The Malleefowl is listed as Vulnerable fauna under the BC Act. Nationally it is also listed as Vulnerable under the EPBC Act, and internationally is on the IUCN Red List of Threatened Species as Vulnerable.

A total of three fauna habitat types where described and mapped within the study area; open woodland, mallee, and shrubland. All three fauna habitats were considered to be well represented in the Murchison bioregion.

5.0 STUDY TEAM

The detailed flora and vegetation survey was planned, co-ordinated and executed by the following personnel:

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Mr Todd Griffin		GIS Specialist

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APPENDIX 1

Summary of results from previous flora and vegetation surveys within or in close proximity to the study area

Report	Survey Timing & Intensity	Vegetation Associations & Landform	Taxon Summary	Significant Flora
Onshore Environmental (1995) Outline for Biological and Environmental Components of a Notice of Intent, M27/39 and M27/200 Leases, Black Swan Nickel Project	9-11 October 1995	10 vegetation associations	108 taxa, 28 families, 49 genera, 2 introduced species	No Threatened or Priority Flora recorded
Onshore Environmental (2004a) Proposed Miscellaneous License Low Salinity Exploration Targets	13 quadrats 29-30 October 2004	5 vegetation associations	97 taxa, 26 families, 50 genera, 1 introduced species	No Threatened or Priority Flora recorded
Onshore Environmental (2004b) Flora and Vegetation Survey – Federal Pit – Black Swan Pipeline Route	38 quadrats 25-26 October 2004	17 vegetation associations	119 taxa, 24 families, 48 genera, 8 introduced species	No Threatened or Priority Flora recorded
Onshore Environmental (2003a) Flora and Vegetation, Leinster – Wiluna Optic Fibre Cable Route	No quadrats 15 – 19 September 2003	20 vegetation associations	188 taxa, 33 families, 73 genera, 4 introduced species	No Threatened Flora Three Priority Flora[1]: *Eremophila pungens* (P4), *Grevillea inconspicua* (P4) and *Hemigenia exilis* (P4)
Onshore Environmental (2003b) Flora and Vegetation, Meekatharra – Wiluna Optic Fibre Cable Route	No quadrats 8 – 10 February 2003	11 vegetation associations	Total recorded taxa not provided; 3 introduced species	No Threatened Flora One Priority Flora: *Micromyrtus mucronulata*[2] (P1)
Onshore Environmental (2007) Oakover Gold Ltd Mt Magnet Tenement Targeted Significant Flora Survey	No quadrats 21 – 24 February 2007	Four vegetation associations	Total recorded taxa not provide; no introduced species	No Threatened or Priority Flora recorded

[1] *Baeckea* sp. Melita Station (H. Pringle 2738), *Calytrix erosipetala* and *Calytrix uncinate* were recorded as P3 species, and *Acacia balsamea* as a P4 species at the time of the survey, but are no longer listed as a Priority species

[2] Recorded as *Micromyrtus racemosa* var. *mucronata* at the time of the survey

Report	Survey Timing & Intensity	Vegetation Associations & Landform	Taxon Summary	Significant Flora
Onshore Environmental (2008a) Proposed Pits at Crusader, 450 South, Zone 2 and New Woman Projects, Flora and Vegetation Survey	73 quadrats 27 March – 3 April 2008	11 vegetation associations	138 taxa, 37 families, 59 genera; 3 introduced species	No Threatened Flora Two Priority Flora: *Hybanthus floribundus* subsp. *chloroxanthus* (P3) and *Eremophila pungens* (P4)
Onshore Environmental (2008b) Emu – Vivien Pipeline, Vivien, Vivien Gem, Turret North and Cinderella Projects, Flora and Vegetation Survey	66 quadrats 29 January – 5 February 2008	12 vegetation associations	136 taxa, 31 families, 65 genera, 2 introduced species	No Threatened Flora Four Priority Flora[3]: *Hybanthus floribundus* subsp. *chloroxanthus* (P3), *Thryptomene* sp. *Leinster* (B.J. Lepschi & L.A. Craven 4362) (P3), *Eremophila pungens* (P4) and *Grevillea inconspicua* (P4)
GHD (2011) Main Roads Western Australia, Report for Goldfields Highway, SLK 737-748 Biological Survey	No quadrats 8 – 11 November 2010	Eight vegetation associations	98 taxa, 24 families, 50 genera, 2 introdices species	No Threatened or Priority Flora recorded
AECOM Australia (2014) Square Kilometre Array Ecological Assessment	65 quadrats September 2014	15 vegetation associations	199 taxa, 36 families, 82 genera, 4 introduced species	No Threatened Flora Six Priority Flora: *Gunniopsis divisa* (P3), *Hemigenia tysonii* (P3), *Ptilotus beardie* (P3), *Sauropus* sp. Woolgorong (M. Officer s.n. 10/8/94) (P3), *Verticordia jamiesonii* (P3) and *Frankenia confuse* (P4); additional *Eremophila simulans* subsp. *megacalyx* (P3) was previously recorded in the area
GHD (2016) Main Roads Western Australia, Goldfield Highway Material Sources SLK 748 to 781 Biological Survey	20 quadrats 9 – 12 November 2015	Nine vegetation associations	114 taxa, 24 families, 55 genera, 1 introduced species	No Threatened or Priority Flora recorded

[3] *Baeckea* sp. Melita Station (H. Pringle 2738) and *Calytrix erosipetala* were recorded as P3 species at the time of the survey, but are no longer listed as a Priority species

APPENDIX 2

Status codes for species listed on the IUCN 'Red List'

Category	Description
Extinct (EX)	A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
Extinct in the Wild (EW)	A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
Critically Endangered (CR)	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.
Endangered (EN)	A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.
Vulnerable (VU)	A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.
Near Threatened (NT)	A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
Least Concern (LC)	A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.
Data Deficient (DD)	A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.
Not Evaluated (NE)	A taxon is Not Evaluated when it has not yet been evaluated against the criteria.

APPENDIX 3

Conservation categories for species listed under the EPBC Act

Category	Description
Extinct	A species is extinct if there is no reasonable doubt that the last member of the species has died.
Extinct in the Wild	A species is categorised as extinct in the wild if it is only known to survive in cultivations, in captivity, or as a naturalised population well outside its past range; or if it has not been recorded in its known/expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
Critically Endangered	The species is facing an extremely high risk of extinction in the wild and 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.
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.

APPENDIX 4

Conservation categories for species listed under the WC Act

Fauna Species - Wildlife Conservation (Specially Protected Fauna) Notice 2017

Category	Description
Schedule 1	Fauna that is rare or is likely to become extinct as critically endangered fauna.
Schedule 2	Fauna that is rare or is likely to become extinct as endangered fauna.
Schedule 3	Fauna that is rare or is likely to become extinct as vulnerable fauna.
Schedule 4	Fauna presumed to be extinct.
Schedule 5	Migratory birds protected under an international agreement.
Schedule 6	Fauna that is of special conservation need as conservation dependent fauna.
Schedule 7	Other specially protected fauna.

APPENDIX 5

Conservation codes for Western Australian species

Threatened Species

Published as Specially Protected under the *Wildlife Conservation Act 1950*, and listed under Schedules 1 to 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice* for Threatened Fauna and *Wildlife Conservation (Rare Flora) Notice* for Threatened Flora (which may also be referred to as Declared Rare Flora).

Threatened fauna is that subset of 'Specially Protected Fauna' declared to be 'likely to become extinct' pursuant to section 14(4) of the *Wildlife Conservation Act*.

Threatened flora is flora that has been declared to be 'likely to become extinct or is rare, or otherwise in need of special protection', pursuant to section 23F(2) of the *Wildlife Conservation Act*.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria.

Priority One: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

Priority Two: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

Priority Three: Poorly-known species

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

Priority Four: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species 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 species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

APPENDIX 6

Vegetation condition scale
(as developed by Keighery 1994)

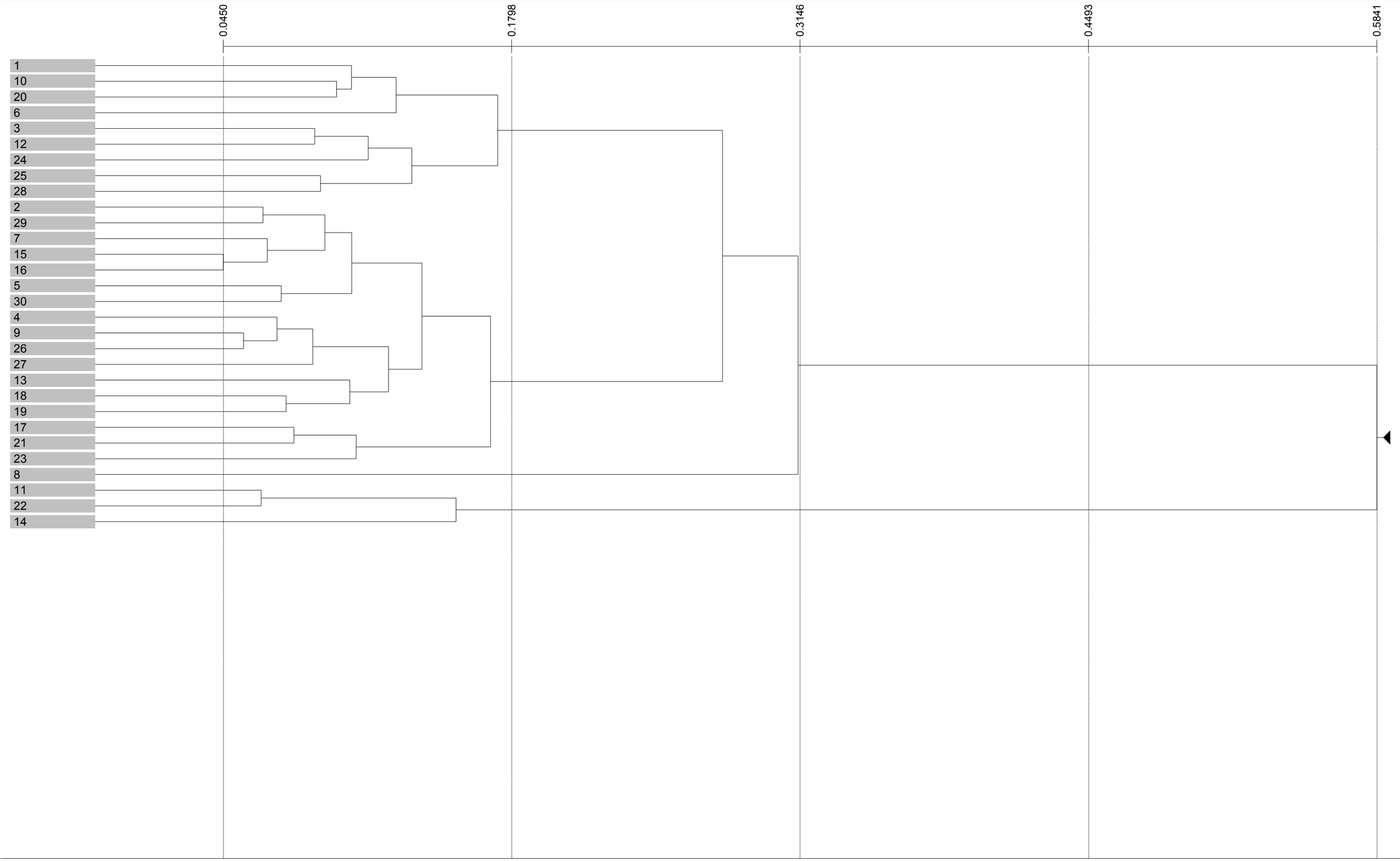
Condition	Code	Description
Pristine	1	Pristine or nearly so, no obvious signs of disturbance.
Excellent	2	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	3	Vegetation structure altered; obvious signs of disturbance.
Good	4	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it.
Degraded	5	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching Very Good condition without intensive management.
Completely Degraded	6	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species.

APPENDIX 7

Column Fusion Dendrogram
30 quadrats by 104 plant taxa

Fusion Type: Flexible UPGMA Beta = -0.10
On Association: Two-Step (Columns) Created on: 11:28:29, December 08, 2019

Column Fusion Dendrogram



APPENDIX 8

Vegetation classifications for the Pilbara based on Specht (1970), as modified by Aplin (1979) and Trudgen (2009)

Height Class	Canopy Cover				
	100 - 70%	70 - 30%	30 - 10%	10 - 2%	< 2%
Trees > 30 m	High Closed Forest	High Open Forest	High Woodland	High Open Woodland	Scattered Tall Trees
Trees 10-30m	Closed Forest	Open Forest	Woodland	Open Woodland	Scattered Trees
Trees < 10 m	Low Closed Woodland	Low Open Forest	Low Woodland	Low Open Woodland	Scattered Low Trees
Mallee	Closed Mallee	Mallee	Open Mallee	Very Open Mallee	Scattered Mallees
Shrubs > 2 m	Closed Scrub	Open Scrub	High Shrubland	High Open Shrubland	Scattered Tall Shrubs
Shrubs 1-2 m	Closed Heath	Open Heath	Shrubland	Open Shrubland	Scattered Shrubs
Shrubs < 1 m	Low Closed Heath	Low Open Heath	Low Shrubland	Low Open Shrubland	Low Scattered Shrubs
Hummock Grass	Closed Hummock Grassland	Hummock Grassland	Open Hummock Grassland	Very Open Hummock Grassland	Scattered Hummock Grass
Tussock Grass	Closed Tussock Grassland	Tussock Grassland	Open Tussock Grassland	Very Open Tussock Grassland	Scattered Tussock Grass
Bunch Grass	Closed Bunch Grassland	Bunch Grassland	Open Bunch Grassland	Very Open Bunch Grassland	Scattered Bunch Grass
Sedges	Closed Sedges	Sedges	Open Sedges	Very Open Sedges	Scattered Sedges
Herbs	Closed Herbs	Herbs	Open Herbs	Very Open Herbs	Scattered Herbs

Source: S. Van Leeuwen (DBCA)

APPENDIX 9

Total flora list from the study area

Family	Genus	Species	Infra Rank	Infra Name
Amaranthaceae	Ptilotus	brucei		
Amaranthaceae	Ptilotus	obovatus		
Apocynaceae	Alyxia	buxifolia		
Apocynaceae	Marsdenia	australis		
Asteraceae	Cratystylis	microphylla		
Asteraceae	Cratystylis	subspinescens		
Asteraceae	Olearia	muelleri		
Casuarinaceae	Casuarina	pauper		
Chenopodiaceae	Atriplex	codonocarpa		
Chenopodiaceae	Atriplex	nummularia	subsp.	spathulata
Chenopodiaceae	Atriplex	vesicaria		
Chenopodiaceae	Chenopodium	gaudichaudianum		
Chenopodiaceae	Enchylaena	tomentosa	var.	tomentosa
Chenopodiaceae	Eriochiton	sclerolaenoides		
Chenopodiaceae	Maireana	georgei		
Chenopodiaceae	Maireana	pentatropis		
Chenopodiaceae	Maireana	pyramidata		
Chenopodiaceae	Maireana	sedifolia		
Chenopodiaceae	Maireana	tomentosa		
Chenopodiaceae	Maireana	trichoptera		
Chenopodiaceae	Maireana	triptera		
Chenopodiaceae	Maireana	villosa		
Chenopodiaceae	Maireana		sp.	indet
Chenopodiaceae	Rhagodia	spinescens		
Chenopodiaceae	Salsola	australis		
Chenopodiaceae	Sclerolaena	cuneata		
Chenopodiaceae	Sclerolaena	diacantha		
Chenopodiaceae	Sclerolaena	drummondii		
Chenopodiaceae	Sclerolaena	fusiformis		
Chenopodiaceae	Sclerolaena	obliquicuspis		
Fabaceae	Acacia	? incurvaneura x mulganeura		
Fabaceae	Acacia	aptaneura		
Fabaceae	Acacia	burkittii		
Fabaceae	Acacia	duriuscula		
Fabaceae	Acacia	erinacea		
Fabaceae	Acacia	hemiletes		
Fabaceae	Acacia	incurvaneura		
Fabaceae	Acacia	kalgoorliensis		
Fabaceae	Acacia	mulganeura		
Fabaceae	Acacia	murrayana		
Fabaceae	Acacia	oswaldii		
Fabaceae	Acacia	tetragonophylla		
Fabaceae	Acacia		cf.	kempeana
Fabaceae	Senna	artemisioides	subsp.	filifolia
Fabaceae	Senna	artemisioides	subsp.	x artemisioides
Fabaceae	Senna	cardiosperma		
Fabaceae	Senna	stowardii		
Fabaceae	Templetonia	ceracea		
Fabaceae	Templetonia	incrassata		
Frankeniaceae	Frankenia	interioris		
Goodeniaceae	Scaevola	spinescens		
Lamiaceae	Westringia	rigida		
Lamiaceae	Prostanthera	althoferi	subsp.	althoferi
Lamiaceae	Prostanthera	grylloana		
Lamiaceae	Teucrium	teucriiflorum		
Loranthaceae	Amyema	benthamii		
Loranthaceae	Amyema	fitzgeraldii		

Family	Genus	Species	Infra Rank	Infra Name
Loranthaceae	Amyema	gibberula	subsp.	gibberula
Loranthaceae	Lysiana		cf.	exocarpi
Malvaceae	Brachychiton	gregorii		
Montiaceae	Calandrinia		sp.	indet
Myrtaceae	Eucalyptus	celastroides	subsp.	celastroides
Myrtaceae	Eucalyptus	concinna		
Myrtaceae	Eucalyptus	lesouefii		
Myrtaceae	Eucalyptus	longissima		
Myrtaceae	Eucalyptus	salmonophloia		
Myrtaceae	Eucalyptus	salubris		
Myrtaceae	Eucalyptus	transcontinentalis		
Myrtaceae	Eucalyptus	yilgarnensis		
Pittosporaceae	Pittosporum	angustifolium		
Poaceae	Aristida		sp.	indet
Poaceae	Austrostipa		sp.	indet.
Poaceae	Eragrostis	dielsii		
Poaceae	Poaceae		sp.	indet.
Poaceae	Triodia	scariosa		
Proteaceae	Grevillea	nematophylla	subsp.	nematophylla
Proteaceae	Hakea	recurva	subsp.	arida
Rubiaceae	Psydrax	sauveolens		
Rutaceae	Philotheca	brucei		
Santalaceae	Exocarpos	aphyllus		
Santalaceae	Santalum	acuminatum		
Santalaceae	Santalum	spicatum		
Sapindaceae	Alectryon	oleifolius	subsp.	canescens
Sapindaceae	Alectryon	oleifolius	subsp.	oleifolius
Sapindaceae	Dodonaea	lobulata		
Sapindaceae	Dodonaea	rigida		
Scrophulariaceae	Eremophila	alternifolia		
Scrophulariaceae	Eremophila	decipiens	subsp.	decipiens
Scrophulariaceae	Eremophila	georgei		
Scrophulariaceae	Eremophila	glabra	subsp.	glabra
Scrophulariaceae	Eremophila	granitica		
Scrophulariaceae	Eremophila	interstans	subsp.	interstans
Scrophulariaceae	Eremophila	latrobei	subsp.	latrobei
Scrophulariaceae	Eremophila	longifolia		
Scrophulariaceae	Eremophila	maculata	subsp.	brevifolia
Scrophulariaceae	Eremophila	oldfieldii	subsp.	angustifolia
Scrophulariaceae	Eremophila	oppositifolia	subsp.	angustifolia
Scrophulariaceae	Eremophila	pantonii		
Scrophulariaceae	Eremophila	parvifolia	subsp.	auricampa
Scrophulariaceae	Eremophila	scoparia		
Solanaceae	Solanum	lasiophyllum		
Solanaceae	Solanum	nummularia		
Solanaceae	Solanum	orbiculatum		
Zygophyllaceae	Zygophyllum		sp.	indet

APPENDIX 10

Species by site matrix for the study area

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Acacia ? incurvaneura x mulganeura		1		1			1	1	1				1		1		1	1					1				1			
Acacia aptaneura												1																		
Acacia burkittii		1		1					1			1	1		1	1	1	1			1		1	1		1			1	
Acacia duriuscula		1	1	1	1	1	1	1	1	1			1		1	1	1	1	1		1		1	1	1	1	1	1	1	1
Acacia erinacea																														
Acacia hemiteles						1						1	1	1				1		1							1	1		1
Acacia incurvaneura													1					1	1		1						1			
Acacia kalgoorliensis						1																							1	
Acacia mulganeura				1				1							1		1	1	1		1		1			1				
Acacia murrayana																														
Acacia oswaldii														1						1			1							
Acacia tetragonophylla	1	1	1	1			1	1	1	1		1	1		1	1	1	1	1	1	1		1		1	1		1	1	1
Acacia cf. Kempeana			1																											
Alectryon oleifolius subsp. canescens																														
Alectryon oleifolius subsp. oleifolius																					1		1				1		1	1
Alyxia buxifolia															1	1	1				1					1			1	
Amyema benthamii																														
Amyema fitzgeraldii													1																	
Amyema gibberula subsp. gibberula																														
Aristida sp. indet										1																				
Atriplex codonocarpa											1																			
Atriplex nummularia subsp. spathulata	1										1											1			1					
Atriplex vesicaria	1					1					1	1	1	1								1		1				1		
Austrostipa sp. indet																				1									1	
Brachychiton gregorii																														
Calandrinia sp. indet										1																				
Casuarina pauper		1			1	1	1		1				1		1	1	1		1		1			1	1	1	1	1	1	1
Chenopodium gaudichaudianum											1												1							
Cratystylis microphylla																														
Cratystylis subspinescens	1																													
Dodonaea lobulata	1	1	1	1	1	1	1			1		1		1	1	1	1		1		1		1	1	1	1	1	1	1	1
Dodonaea rigida							1	1	1			1					1				1					1	1			
Enchylaena tomentosa var. tomentosa			1			1					1	1							1			1	1							
Eragrostis dielsii														1																
Eremophila alternifolia																					1									
Eremophila decipiens subsp. decipiens			1								1			1	1		1		1	1			1						1	
Eremophila georgei							1									1	1													
Eremophila glabra subsp. glabra		1			1	1									1						1		1		1				1	1
Eremophila granitica		1				1		1	1				1				1	1	1		1					1	1			
Eremophila interstans subsp. interstans														1																
Eremophila latrobei subsp. latrobei													1																	
Eremophila longifolia				1																										
Eremophila maculata subsp. brevifolia											1											1								
Eremophila oldfieldii subsp. angustifolia		1					1		1	1				1	1	1	1		1		1								1	1
Eremophila oppositifolia subsp. angustifolia																	1				1				1			1		
Eremophila pantonii						1							1	1				1	1	1	1				1			1		1
Eremophila parvifolia subsp. auricampa	1	1				1								1							1			1	1			1	1	
Eremophila scoparia	1		1							1	1			1						1		1		1						
Eriochiton sclerolaenoides						1					1			1																
Eucalyptus celastroides subsp. celastroides														1																
Eucalyptus concinna			1		1							1	1	1									1							
Eucalyptus lesouefii		1				1								1											1					
Eucalyptus longissima				1	1			1									1	1					1			1	1			
Eucalyptus salmonophloia	1		1							1		1							1	1				1			1			
Eucalyptus salubris											1	1		1								1								
Eucalyptus transcontinentalis										1										1				1						
Eucalyptus yilgarnensis																				1										
Exocarpos aphyllus											1			1																
Frankenia interioris											1																			

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Grevillea nematophylla subsp. nematophylla				1				1											1				1							
Hakea recurva subsp. arida																					1									
Lysiana cf. exocarpi																					1									
Maireana georgei	1									1					1															1
Maireana pentatropis						1																			1					
Maireana pyramidata											1											1								
Maireana sedifolia										1	1			1								1		1	1			1	1	
Maireana tomentosa	1									1	1											1		1						
Maireana trichoptera	1					1					1		1	1								1								
Maireana triptera	1					1				1	1			1				1				1		1				1		
Maireana villosa	1					1					1		1	1				1		1					1					
Maireana sp. indet		1																												
Marsdenia australis	1		1	1		1			1			1	1		1	1	1				1					1				
Olearia muelleri									1					1	1	1	1				1				1					
Philotheca brucei		1														1														
Pittosporum angustifolium			1	1								1															1			
Poaceae sp. indet	1																													
Prostanthera althoferi subsp. althoferi									1								1				1									
Prostanthera grylloana																					1									
Psydrax sauveolens								1													1									
Philotheca brucei																	1													
Ptilotus obovatus	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1
Rhagodia spinescens														1									1							
Salsola australis																														
Santalum acuminatum			1																											
Santalum spicatum							1									1					1					1				
Scaevola spinescens		1	1	1	1	1	1		1	1			1		1	1	1	1	1	1	1		1	1	1	1	1	1	1	1
Sclerolaena cuneata											1																			
Sclerolaena diacantha	1		1							1	1			1						1		1		1						
Sclerolaena drummondii	1									1	1											1			1					
Sclerolaena fusiformis		1								1												1								
Sclerolaena obliquicuspis						1					1			1								1								
Senna artemisioides subsp. filifolia	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1
Senna artemisioides subsp. x artemisioides				1			1		1																					
Senna cardiosperma																				1				1						
Senna stowardii																														
Solanum lasiophyllum													1																	
Solanum nummularia																											1			
Solanum orbiculatum																														
Templetonia ceracea										1																				
Templetonia incrassata		1	1		1										1	1							1		1			1	1	1
Teucrium teucriiflorum																														
Triodia scariosa						1																				1				
Westringia rigida					1	1																							1	
Zygophyllum sp. indet										1																				

APPENDIX 11

Representative photographs, raw data and total flora spreadsheets recorded for the 30 quadrats assessed within the study area

Study Sites

SITE_ID	LANDFORM	BROAD_FF	VEG_ASSOC	VEG_COND	SLOPE	LAST_FIRE	COMMENTS	EASTING	NORTHING
ES-01	Stony Plain	Eucalyptus Woodland	Woodland of Eucalyptus salmonophloia over Low Scrub A of Eremophila scoparia with Open Scrub of Eremophila scoparia overOpen Dwarf Scrub C of Senna artemisioides subsp. filifolia, Sclerolaena diacantha and Maireana trichoptera	Very Good	Flat	Old (6+ yr)	Disturbance - Road/ Access Track	364421	6638151
ES-02	Undulating Low Hills	Dodonaea Dwarf Scrub C	Dwarf Scrub C of Dodonaea lobulata, Scaevola spinescens and Ptilotus obovatus with Open Low Woodland A of Casuarina pauper over Open Scrub of Acacia duriuscula and Acacia burkittii over Open Low Scrub A of Senna artemisioides subsp. filifolia, Dodonaea lobulata and Acacia tetragonophylla	Very Good	Low	Old (6+ yr)	Disturbance - Road/ Access Track; Undulating Slopes;	363405	6638182
ES-03	Drainage Area/ Floodplain	Eucalyptus Low Woodland A	Low Woodland A of Eucalyptus concinna and Eucalyptus salmonophloia over Low Scrub A of Senna artemisioides subsp. filifolia and Dodonaea lobulata with Open Scrub of Acacia cf. kempeana, Eremophila scoparia and Acacia duriuscula over Open Woodland of Pittosporum angustifolium and Eucalyptus concinna	Very Good	Flat	Old (6+ yr)		363702	6638144
ES-04	Drainage Area/ Floodplain	Eucalyptus Open Tree Mallee	Open Tree Mallee of Eucalyptus longissima and (Eucalyptus concinna) over Scrub of Acacia ?incurvaneura x mulganeura, Acacia burkittii and Acacia duriuscula over Open Low Scrub A of Eucalyptus salmonophloia and Senna artemisioides subsp. x artemisioides over Open Dwarf Scrub C of Ptilotus obovatus	Very Good	Low	Old (6+ yr)	Distrubance - Road/ Access Track	363348	6637765
ES-05	Stony Plain	Eucalyptus Open Tree Mallee	Open Tree Mallee of Eucalyptus longissima and Eucalyptus concinna over Dwarf Scrub C of Senna artemisioides subsp. filifolia, Dodonaea lobulata and Ptilotus obovatus with Open Low Scrub A of Acacia duriuscula, Senna artemisioides subsp. filifolia and Templetonia incrassata	Excellent	Low	Old (6+ yr)		363301	6637982
ES-06	Calcrete Plain	Senna Low Scrub A	Low Scrub A of Senna artemisioides subsp. filifolia, Acacia kalgoorliensis and Eremophila pantonii over Dwarf Scrub C of Acacia kalgoorliensis, Eremophila parvifolia subsp. auricampa and Westringia rigida with Open Low Woodland B of Casuarina pauper and (Eucalyptus lesouefii) over Open Scrub Acacia duriuscula	Excellent	Low	Old (6+ yr)	Disturbance - Road/ Access Track; Undulating Slopes;	363468	6637710
ES-07	Stony Plain	Acacia Low Scrub A	Low Scrub A of Acacia duriuscula, Scaevola spinescens and Dodonaea lobulata with Open Low Woodland A of Acacia duriuscula and Casuarina pauper over Open Scrub of Acacia duriuscula, Acacia ?incurvaneura x mulganeura, Acacia tetragonophylla and Eremophila oldfieldii subsp. angustifolia over Open Dwarf Scrub C of Scaevola spinescens, Dodonaea lobulata and Eucalyptus salmonophloia	Excellent	Low	Old (6+ yr)	Disturbance - Road/ Access Track	363707	6637375
ES-08	Hardpan Plain	Acacia Thicket	Thicket of Acacia ?incurvaneura x mulganeura, Grevillea nematophylla and Acacia mulganeura over Open Low Scrub A of Acacia tetragonophylla and Psydrax suaveolens	Excellent	Low	Old (6+ yr)	Disturbance - Road/ Access Track	363910	6637166
ES-09	Stony Plain	Acacia Scrub	Scrub of Acacia duriuscula, Acacia ?incurvaneura x mulganeura, Acacia mulganeura and (Acacia burkittii) over Dwarf Scrub C of Eremophila granitica, Scaevola spinescens, and Prostanthera althoferi with Open Low Woodland A of Casuarina pauper over Open Low Scrub B of Acacia duriuscula, Acacia tetragonphylla and Scaevola spinescens 'thin	Excellent	Low	Old (6+ yr)	Disturbance - Road/ Access Track; Historical Logging of Salmon gum	363339	6637158
ES-10	Stony Plain	Eucalyptus Low Woodland A	Low Woodland A of Eucalyptus salmonophloia over Open Scrub of Eremophila scoparia over Open Dwarf Scrub C Sclerolaena diacantha, Maireana triptera and Maireana tomentosa	Excellent	Low	Old (6+ yr)	Disturbance - Road/ Access Track	364098	6637932
ES-11	Drainage Area/ Floodplain	Eucalyptus Open Tree Mallee	Open Tree Mallee of Eucalyptus salubris over Dwarf Scrub C of Atriplex vesicaria and Atriplex nummularia subsp. spathulata with Open Low Scrub A of Eremophila scoparia and Maireana pyramidata over Open Dwarf Scrub D of Sclerolaena diacantha, Maireana trichoptera and Maireana tomentosa	Very Good	Flat	Old (6+ yr)	Disturbance - Road/ Access Track - Track in middle of alignment	363184	6635119
ES-12	Sandy/ Stony Plain	Eucalyptus Tree Mallee	Tree Mallee of Eucalyptus salubris and Eucalyptus concinna over Thicket of Acacia burkittii, Acacia aptaneura and (Acacia tetragonophylla) over Open Low Scrub A of Senna artemisioides subsp. filifolia and Acacia hemiteles	Very Good	Flat	Old (6+ yr)	Disturbance - Road/ Access Track - Track in middle of alignment; Fenceline	363219	6635222
ES-13	Stony Plain	Eucalyptus Very Open Tree Mallee	Very Open Tree Mallee of Eucalyptus concinna and Eucalyptus longissima over Open Low Woodland of Casuarina pauper, Casuarina pauper and Acacia ?incurvaneura x mulganeura over Open Scrub of Acacia burkittii, Acacia incurvaneura and Acacia duriuscula over Open Low Scrub B of Senna artemisioides subsp. filifolia and Eremophila granitica	Very Good	Flat	Old (6+ yr)	Disturbance - Road/ Access Track; Rubbish; Fenceline	363355	6635413
ES-14	Hardpan Plain	Eucalyptus Open Tree Mallee	Open Tree Mallee of Eucalyptus salubris, Eucalyptus concinna and Eucalyptus lesouefii over Low Scrub A of Senna artemisioides subsp. filifolia, Eremophila pantonii and Acacia hemiteles with Open Scrub of Eremophila interstans subsp. interstans and Eremophila scoparia over Open Dwarf Scrub D of Atriplex vesicaria, Sclerolaena diacantha and Maireana trichoptera	Very Good	Flat	Old (6+ yr)	Disturbance - Rubbish	363545	6635669
ES-15	Hillcrest and Upper Hillslope	Senna Dwarf Scrub C	Dwarf Scrub C of Senna artemisioides subsp. filifolia, Dodonaea lobulata, Ptilotus obovatus (Scaevola spinescens) with Open Low Woodland A of Casuarina pauper, Acacia mulganeura and Acacia ?incurvaneura x mulganeura over Open Scrub of Acacia duriuscula, Acacia burkittii and Acacia tetragonophylla over Open Low Scrub A of Acacia duriuscula, Senna artemisioides subsp. filifolia, Dodonaea lobulata and (Eremophila oldfieldii subsp. angustifolia)	Very Good	Low	Old (6+ yr)	Disturbance - Road/ Access Track; Fence	364052	6636372
ES-16	Stony Plain	Acacia Scrub	Scrub of Acacia burkittii, Acacia duriuscula and Eremophila oldfieldii subsp. angustifolia with Open Low Woodland A of Casuarina pauper and Casuarina pauper over Very Open Tree Mallee of Eucalyptus longissima over Open Low Scrub B of Scaevola spinescens 'thin, Dodonaea lobulata abd Senna artemisioides subsp. filifolia	Very Good	Low	Old (6+ yr)	Disturbance - Road/ Access Track; Rubbish; Fence	363909	6636168
ES-17	Stony Plain	Casuarina Open Low Woodland A	Open Low Woodland A of Casuarina pauper, Acacia ?incurvaneura x mulganeura and Acacia duriuscula over Open Scrub of Acacia duriuscula, Eremophila oldfieldii subsp. angustifolia and Acacia tetragonophylla over Open Dwarf Scrub C of Scaevola spinescens, Dodonaea lobulata, Eremophila granitica and (Philotheca brucei)	Very Good	Low	Old (6+ yr)	Disturbance - Road/ Access Track; Rubbish; Fence	364355	6636793
ES-18	Hardpan Plain	Eucalyptus Open Tree Mallee	Open Tree Mallee of Eucalyptus longissima and (Eucalyptus concinna) over Scrub of Acacia incurvaneura, Acacia duriuscula and Acacia ?incurvaneura x mulganeura with Open Low Woodland of Acacia mulganeura and Acacia ?incurvaneura x mulganeura over Open Low Scrub A of Scaevola spinescens	Excellent	Flat	Old (6+ yr)	Disturbance - Road/ Access Track	364054	6637190
ES-19	Drainage Area/ Floodplain	Acacia Thicket	Thicket of Acacia incurvaneura and Acacia duriuscula over Open Low Scrub A of Senna artemisioides subsp. filifolia over Open Dwarf Scrub C of Scaevola spinescens, Dodonaea lobulata and Ptilotus obovatus	Very Good	Low	Old (6+ yr)	Disturbance - Road/ Access Track	364413	6637406
ES-20	Stony Plain	Eucalyptus Woodland	Woodland of Eucalyptus salmonophloia and Eucalyptus transcontinentalis over Open Scrub of Eremophila scoparia over Open Low Scrub A of Senna cardiosperma	Very Good	Low	Old (6+ yr)	Disturbance - Road/ Access Track; Rubbish; Historical Logging	364897	6637609

SITE_ID	LANDFORM	BROAD_FF	VEG_ASSOC	VEG_COND	SLOPE	LAST_FIRE	COMMENTS	EASTING	NORTHING
ES-21	Hillcrest and Upper Hillslope	Dodonaea Dwarf Scrub C	Dwarf Scrub C of Dodonaea lobulata, Scaevola spinescens and Olearia muelleri with Open Low Woodland of Casuarina pauper and Casuarina pauper over Open Scrub of Acacia duriuscula, Eremophila oldfieldii subsp. angustifolia, Santalum spicatum and (Acacia tetragonophylla) over Open Low Scrub A of Senna artemisioides subsp. filifolia, Acacia duriuscula and Eremophila oldfieldii subsp. angustifolia	Very Good	Moderate	Old (6+ yr)	Disturbance - Road/ Access Track	366020	6636767
ES-22	Gilgai Plain	Eucalyptus Low Woodland A	Low Woodland A of Eucalyptus salubris over Open Dwarf Scrub C of Eremophila maculata subsp. brevifolia and Ptilotus obovatus over Open Dwarf Scrub C of Enchylaena tomentosa, Maireana trichoptera and Sclerolaena diacantha	Very Good	Flat	Old (6+ yr)	Disturbance - Road/ Access Track - Lots of tracks and disturbance through area	364092	6638292
ES-23	Hardpan Plain	Acacia Low Forest A	Low Forest A of Acacia mulganeura, Acacia ?incurvaneura x mulganeura and (Grevillea nematophylla) over Scrub of Acacia burkittii, Acacia duriuscula and Acacia tetragonophylla with Very Open Tree Mallee of Eucalyptus concinna and (Eucalyptus longissima)	Excellent	Flat	Old (6+ yr)		363293	6638288
ES-24	Drainage Area/ Floodplain	Eucalyptus Woodland	Woodland of Eucalyptus transcontinentalis and (Scattered Eucalyptus salmonophloia) over Open Low Woodland A of Senna artemisioides subsp. filifolia and Eremophila scoparia Open Scrub of Eremophila scoparia and Acacia duriuscula over Open Low Scrub A of Senna artemisioides subsp. filifolia and Eremophila scoparia	Very Good	Low	Old (6+ yr)	Disturbance - Road/ Access Track, Rubbish	363639	6637810
ES-25	Stony Plain	Eucalyptus Open Woodland	Open Woodland of Eucalyptus lesouefii over Low Open Woodland of Casuarina pauper and Casuarina pauper over Open Low Scrub A of Eremophila pantonii and Senna artemisioides subsp. filifolia over Open Dwarf Scrub C of Eremophila parvifolia subsp. auricampa, Maireana pyramidata and Ptilotus obovatus	Good	Low	Old (6+ yr)	Disturbance - Road/ Access Track, Rubbish, Heavily Drilled	363825	6637766
ES-26	Undulating Low Hills	Acacia Scrub	Scrub of Acacia duriuscula and (Eremophila granitica, Santalum spicatum and Acacia tetragonophylla) with Open Low Woodland A of Acacia duriuscula and Casuarina pauper with Eucalyptus longissima over Open Low Scrub A of Acacia duriuscula, Scaevola spinescens and Dodonaea lobulata over Dodonaea lobulata, Scaevola spinescens and Eremophila granitica	Very Good	Low	Old (6+ yr)	Disturbance - Road/ Access Track, Track in alignment	365174	6637604
ES-27	Stony Plain	Acacia Scrub	Scrub of Acacia incurvaneura, Acacia duriuscula and Acacia ?incurvaneura x mulganeura with Open Low Woodland A of Casuarina pauper and Casuarina pauper over Open Low Scrub A of Senna artemisioides subsp. filifolia, Scaevola spinescnes 'thin' and Acacia hemiteles over Open Dwarf Scrub C of Dodonaea lobulata, Scaevola spinescens and Ptilotus obovatus	Good	Flat	Old (6+ yr)	Disturbance - Road/ Access Track, Heavily Drilled	365431	6637402
ES-28	Sandy/ Stony Plain	Senna Low Scrub A	Low Scrub A of Senna artemisioides subsp. filifolia, Dodonaea lobulata and Eremophila pantonii with Open Low Woodland A of Casuarina pauper over Open Scrub Acacia duriuscula over Open Dwarf Scrub C of Scaevola spinescens, Ptilotus obovatus and Atriplex vesicaria	Very Good	Low	Old (6+ yr)	Disturbance - Road/ Access Track	366535	6636139
ES-29	Hillcrest and Upper Hillslope	Acacia Low Scrub A	Low Scrub A of Acacia duriuscula, Acacia kalgoorliensis and Senna artemisioides subsp. filifolia over Scaevola spinescens, Dodonaea lobulata, Westringia rigida and Eremophila parvifolia subsp. auricampa with Open Scrub of Acacia duriuscula	Very Good	Low	Old (6+ yr)	Disturbance - Road/ Access Track	366641	6636001
ES-30	Hillcrest and Upper Hillslope	Senna Low Scrub A	Low Scrub A of Senna artemisioides subsp. filifolia, Dodonaea lobulata and Scaevola spinescens with Open Scrub Acacia duriuscula over Open Dwarf Scrub C of Senna artemisioides subsp. filifolia	Good	Low	Old (6+ yr)	Disturbance - Road/ Access Track; Extensive Drilling and Tracks	367051	6635418

Flora

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-01	Acacia	tetragonophylla				+	1	Very Good
	ES-01	Atriplex	nummularia	subsp.	spathulata	ES01.17	+	1-1.5	Very Good
	ES-01	Atriplex	vesicaria			ES01.12	+	0.5	Very Good
	ES-01	Cratystylis	subspinescens			ES01.13	+	0.5-1	Very Good
	ES-01	Dodonaea	lobulata			ES01.06	+	0.5	Very Good
OPP COLL	ES-01	Eremophila	maculata	subsp.	brevifolia	ES01.18		1	Very Good
OPP COLL	ES-01	Eremophila	maculata	subsp.	brevifolia	ES01.19		1	Very Good
	ES-01	Eremophila	parvifolia	subsp.	auricampa	ES01.05	+	0.6	Very Good
	ES-01	Eremophila	scoparia			ES01.02	12	1.5-3	Very Good
	ES-01	Eucalyptus	salmonophloia			ES01.03	24	8-15	Very Good
	ES-01	Maireana	georgei			ES01.08	+	0.2	Very Good
OPP COLL	ES-01	Maireana	pyramidata			ES01.16		0.5-1	Very Good
	ES-01	Maireana	tomentosa			ES01.11	+	0.2	Very Good
	ES-01	Maireana	trichoptera			ES01.04	0.5	0.2	Very Good
	ES-01	Maireana	triptera			ES01.09	0.5	0.4	Very Good
	ES-01	Maireana	villosa			ES01.15	0.5	0.3	Very Good
	ES-01	Marsdenia	australis				+	Cl	Very Good
	ES-01	Poaceae		sp.	indet.	ES01.10	+	0.1	Very Good
	ES-01	Ptilotus	obovatus				0.5	0.75	Very Good
	ES-01	Sclerolaena	diacantha			ES01.07	1	0.2	Very Good
	ES-01	Sclerolaena	drummondii			ES01.01	+	0.2	Very Good
	ES-01	Senna	artemisioides	subsp.	filifolia	ES01.03A	1	1	Very Good
	ES-01	Senna	artemisioides	subsp.	filifolia		+	1	Very Good
	ES-02	Acacia	? incurvaneura x mulganeura			ES02.01	2	2-4	Very Good
	ES-02	Acacia	burkittii			ES02.10	2	2	Very Good
	ES-02	Acacia	duriuscula			ES02.02	7	2-3	Very Good
OPP COLL	ES-02	Acacia	oswaldii			ES02.11	+		Very Good
OPP COLL	ES-02	Acacia	oswaldii			ES02.13			Very Good
	ES-02	Acacia	tetragonophylla				2	1-2	Very Good
OPP COLL	ES-02	Alectryon	oleifolius	subsp.	canescens	ES02.14			Very Good
	ES-02	Casuarina	pauper			ES02.04	0.5	4	Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-02	Casuarina	pauper			ES02.18	+	Cl	Very Good
	ES-02	Dodonaea	lobulata			ES02.05	8	0.5-1.5	Very Good
OPP COLL	ES-02	Eremophila	decipiens	subsp.	decipiens	ES02.19			Very Good
	ES-02	Eremophila	glabra	subsp.	glabra	ES02.08	0.5	1-2	Very Good
	ES-02	Eremophila	granitica			ES02.03	+	0.35	Very Good
	ES-02	Eremophila	oldfieldii	subsp.	angustifolia	ES02.16	1	1-2	Very Good
	ES-02	Eremophila	parvifolia	subsp.	auricampa	ES02.09	+	0.5	Very Good
	ES-02	Eucalyptus	lesouefii			ES02.07	0.5	8	Very Good
OPP COLL	ES-02	Maireana	sedifolia			ES02.12			Very Good
	ES-02	Maireana		sp.	indet		+	0.2	Very Good
	ES-02	Philotheca	brucei				1	0.5-1	Very Good
	ES-02	Ptilotus	obovatus				4	0.5-1	Very Good
	ES-02	Scaevola	spinescens			ES02.17	1	0.5-1	Very Good
	ES-02	Scaevola	spinescens				3.5	0.5-1	Very Good
	ES-02	Sclerolaena	fusiformis			ES02.15	+	0.2	Very Good
	ES-02	Senna	artemisioides	subsp.	filifolia	ES01.03A	3	1-2	Very Good
	ES-02	Templetonia	incrassata			ES02.06	2	6-8	Very Good
	ES-03	Acacia	duriuscula			ES02.02	3	3-4	Very Good
OPP COLL	ES-03	Acacia	murrayana			ES03.09		4	Very Good
	ES-03	Acacia	tetragonophylla				0.5	4	Very Good
	ES-03	Acacia		cf.	kempeana	ES03.03	4	3-5	Very Good
	ES-03	Dodonaea	lobulata			ES02.05	2	0.5-2.5	Very Good
	ES-03	Enchylaena	tomentosa	var.	tomentosa	ES03.01	0.5	0.3	Very Good
	ES-03	Enchylaena	tomentosa	var.	tomentosa	ES03.02	0.5	1.5	Very Good
	ES-03	Eremophila	decipiens	subsp.	decipiens	ES02.19	1	1	Very Good
OPP COLL	ES-03	Eremophila	interstans	subsp.	interstans	ES03.08		1.5	Very Good
	ES-03	Eremophila	scoparia			ES01.02	3	2-4	Very Good
	ES-03	Eucalyptus	concinna			ES03.05	25	8-12	Very Good
	ES-03	Eucalyptus	salmonophloia			ES03.06	2.5	8-15	Very Good
OPP COLL	ES-03	Maireana	tomentosa			ES01.11			Very Good
	ES-03	Marsdenia	australis				0.5	Cl	Very Good
	ES-03	Pittosporum	angustifolium			ES03.04	0.5	1.5	Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-03	Ptilotus	obovatus				1	0.5-1	Very Good
	ES-03	Santalum	acuminatum			ES03.07	0.5	4	Very Good
	ES-03	Scaevola	spinescens				1	0.5-1	Very Good
	ES-03	Sclerolaena	diacantha			ES01.07	0.5	0.3	Very Good
	ES-03	Senna	artemisioides	subsp.	filifolia	ES01.03A	15	1-2	Very Good
OPP COLL	ES-03	Solanum	nummularia			ES03.10			Very Good
	ES-03	Templetonia	incrassata			ES02.06	0.5	1.5	Very Good
	ES-04	Acacia	? incurvaneura x mulganeura			ES04.02	8	3-5	Very Good
	ES-04	Acacia	burkittii			ES02.10	4.5	2-3	Very Good
	ES-04	Acacia	duriuscula			ES02.02	3	2-3	Very Good
	ES-04	Acacia	mulganeura			ES04.03	3	2-4	Very Good
	ES-04	Acacia	tetragonophylla				2	2-3	Very Good
	ES-04	Dodonaea	lobulata			ES02.05	0.5	1.5	Very Good
	ES-04	Eremophila	longifolia			ES04.06	+	1.8	Very Good
OPP COLL	ES-04	Eucalyptus	concinna			ES05.01			Very Good
	ES-04	Eucalyptus	longissima			ES04.01	20	5-8	Very Good
	ES-04	Grevillea	nematophylla	subsp.	nematophylla	ES04.04	1	2-5	Very Good
	ES-04	Marsdenia	australis				+	Cl	Very Good
	ES-04	Pittosporum	angustifolium			ES03.04	+	2	Very Good
	ES-04	Ptilotus	obovatus				3	0.5	Very Good
	ES-04	Scaevola	spinescens				+	1	Very Good
	ES-04	Senna	artemisioides	subsp.	filifolia	ES01.03A	3	1-1.5	Very Good
	ES-04	Senna	artemisioides	subsp.	x artemisioides	ES04.05	1	1-2	Very Good
	ES-05	Acacia	duriuscula			ES02.02	2	1-2	Excellent
OPP COLL	ES-05	Acacia	hemiteles			ES05.03			Excellent
OPP COLL	ES-05	Brachychiton	gregorii			ES05.04			Excellent
	ES-05	Casuarina	pauper			ES07.01	0.5	2-3	Excellent
	ES-05	Dodonaea	lobulata			ES02.05	4	0.5-1	Excellent
	ES-05	Eremophila	glabra	subsp.	glabra	ES02.08	+	1.5	Excellent
	ES-05	Eucalyptus	concinna			ES05.01	5	5-7	Excellent
	ES-05	Eucalyptus	longissima			ES04.01	10	5-7	Excellent
	ES-05	Ptilotus	obovatus				+	0.5	Excellent

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-05	Scaevola	spinescens			ES02.17	+	0.5-1	Excellent
	ES-05	Scaevola	spinescens				0.5	0.5-1	Excellent
	ES-05	Senna	artemisioides	subsp.	filifolia	ES01.03A	10	0.5-1.5	Excellent
	ES-05	Templetonia	incrassata			ES02.06	0.5	1-2	Excellent
	ES-05	Westringia	rigida			ES05.02	+	0.5	Excellent
OPP COLL	ES-06	Acacia	burkittii			ES02.10			Excellent
	ES-06	Acacia	duriuscula			ES07.06	3	2-4	Excellent
	ES-06	Acacia	hemiteles			ES05.03	+	1	Excellent
	ES-06	Acacia	kalgoorliensis			ES06.01	15	1	Excellent
	ES-06	Atriplex	vesicaria			ES06.06	1.5	0.5	Excellent
	ES-06	Casuarina	pauper			ES13.04	3	3-6	Excellent
	ES-06	Dodonaea	lobulata			ES02.05			Excellent
	ES-06	Enchylaena	tomentosa				+	0.3	Excellent
	ES-06	Eremophila	glabra	subsp.	glabra	ES02.08	0.5	1	Excellent
	ES-06	Eremophila	granitica			ES06.05	+	0.5-1	Excellent
	ES-06	Eremophila	pantonii			ES06.02	2	1.5	Excellent
	ES-06	Eremophila	parvifolia	subsp.	auricampa	ES06.03	5	0.5-1	Excellent
	ES-06	Eriochiton	sclerolaenoides			ES06.08	+	0.1	Excellent
	ES-06	Eucalyptus	lesouefii			ES14.04	1	8	Excellent
	ES-06	Maireana	pentatropis			ES06.07	+	1	Excellent
	ES-06	Maireana	trichoptera			ES11.01	+	0.2	Excellent
	ES-06	Maireana	triptera				+	0.2	Excellent
	ES-06	Maireana	villosa			ES01.15	+	0.1	Excellent
	ES-06	Marsdenia	australis				+	Cl	Excellent
	ES-06	Ptilotus	obovatus				1	0.5	Excellent
	ES-06	Scaevola	spinescens				1	0.5-1	Excellent
	ES-06	Sclerolaena	obliquicuspis			ES06.04	+	0.2	Excellent
	ES-06	Senna	artemisioides	subsp.	filifolia	ES01.03A	15	1-2	Excellent
	ES-06	Triodia	scariosa			ES06.09			Excellent
	ES-06	Westringia	rigida			ES05.02	2	0.75	Excellent
	ES-07	Acacia	? incurvaneura x mulganeura			ES04.02	2	2-4	Excellent
	ES-07	Acacia	duriuscula			ES07.06	7	2-4	Excellent

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-07	Acacia	tetragonophylla				2	1-2	Excellent
OPP COLL	ES-07	Alyxia	buxifolia			ES07.04			Excellent
	ES-07	Casuarina	pauper			ES02.18	1	3-8	Excellent
	ES-07	Casuarina	pauper			ES07.01	4	3-8	Excellent
	ES-07	Dodonaea	lobulata			ES02.05	4	0.5-1.8	Excellent
	ES-07	Dodonaea	rigida			ES07.03	0.5	1	Excellent
	ES-07	Eremophila	georgei			ES07.02	1	1-2	Excellent
	ES-07	Eremophila	oldfieldii	subsp.	angustifolia	ES17.04	1	2-3	Excellent
OPP COLL	ES-07	Olearia	muelleri			ES07.05			Excellent
OPP COLL	ES-07	Prostanthera	althoferi	subsp.	althoferi	ES07.07			Excellent
OPP COLL	ES-07	Psydrax	sauveolens						Excellent
	ES-07	Ptilotus	obovatus				1	0.5-1	Excellent
	ES-07	Santalum	spicatum				0.5	2-3	Excellent
	ES-07	Scaevola	spinescens				4	0.5-1.5	Excellent
	ES-07	Senna	artemisioides	subsp.	filifolia	ES01.03A	1	1-2	Excellent
	ES-07	Senna	artemisioides	subsp.	x artemisioides		1	1	Excellent
OPP COLL	ES-07	Teucrium	teucriiflorum						Excellent
	ES-08	Acacia	? incurvaneura x mulganeura			ES17.03	20	3-5	Excellent
OPP COLL	ES-08	Acacia	burkittii			ES02.10		2-4	Excellent
	ES-08	Acacia	duriuscula			ES07.06	5	2-3	Excellent
	ES-08	Acacia	mulganeura			ES04.03	7	3-5	Excellent
	ES-08	Acacia	tetragonophylla				1	1-2.5	Excellent
OPP COLL	ES-08	Alectryon	oleifolius	subsp.	oleifolius	ES08.02			Excellent
OPP COLL	ES-08	Amyema	gibberula	subsp.	gibberula	ES08.01	1	Par	Excellent
OPP COLL	ES-08	Brachychiton	gregorii						Excellent
OPP COLL	ES-08	Casuarina	pauper			ES13.04			Excellent
	ES-08	Dodonaea	rigida			ES07.03	+	1-2	Excellent
	ES-08	Eremophila	granitica			ES06.05	1	1-1.5	Excellent
	ES-08	Eucalyptus	longissima			ES04.01	1	3-7	Excellent
	ES-08	Grevillea	nematophylla	subsp.	nematophylla	ES04.04	10	3-6	Excellent
	ES-08	Psydrax	sauveolens				2	1-3	Excellent
	ES-09	Acacia	? incurvaneura x mulganeura			ES23.01	2	6	Excellent

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-09	Acacia	? incurvaneura x mulganeura			ES23.01	2	6	Excellent
	ES-09	Acacia	burkittii			ES02.10	1	2-3	Excellent
	ES-09	Acacia	duriuscula			ES07.06	10	2-5	Excellent
OPP COLL	ES-09	Acacia	hemiteles			ES05.03			Excellent
	ES-09	Acacia	tetragonophylla				1	1-2	Excellent
	ES-09	Casuarina	pauper			ES13.04	3	8	Excellent
	ES-09	Dodonaea	rigida			ES07.03	0.5	1.5	Excellent
	ES-09	Eremophila	granitica			ES06.05	2	1	Excellent
	ES-09	Eremophila	oldfieldii	subsp.	angustifolia	ES17.04	+	1.5	Excellent
OPP COLL	ES-09	Eucalyptus	concinna			ES02.01			Excellent
OPP COLL	ES-09	Eucalyptus	longissima			ES04.01			Excellent
OPP COLL	ES-09	Eucalyptus	salmonophloia			ES01.03			Excellent
	ES-09	Marsdenia	australis				+	Cl	Excellent
	ES-09	Olearia	muelleri				0.5	0.5	Excellent
	ES-09	Prostanthera	althoferi	subsp.	althoferi	ES07.07	1.5	0.5-1	Excellent
	ES-09	Ptilotus	obovatus				0.5	0.5	Excellent
	ES-09	Scaevola	spinescens				7	0.5-1.5	Excellent
	ES-09	Senna	artemisioides	subsp.	filifolia	ES01.03A	+	1.5	Excellent
	ES-09	Senna	artemisioides	subsp.	x artemisioides		+	1	Excellent
	ES-10	Acacia	duriuscula			ES07.06	2	1-2.5	Very Good
	ES-10	Acacia	tetragonophylla				+	2	Very Good
	ES-10	Aristida		sp.	indet		+	0.2	Very Good
	ES-10	Calandrinia		sp.	indet		+	0.1	Very Good
	ES-10	Dodonaea	lobulata			ES02.05	0.5	1	Very Good
	ES-10	Eremophila	oldfieldii	subsp.	angustifolia	ES17.04	+	1.5-2	Very Good
	ES-10	Eremophila	scoparia			ES14.02	8	1.5-3	Very Good
OPP COLL	ES-10	Eucalyptus	celastroides	subsp.	celastroides	ES10.05			Very Good
	ES-10	Eucalyptus	salmonophloia			ES01.03	15	8-10	Very Good
	ES-10	Eucalyptus	transcontinentalis			ES24.01	1	10	Very Good
	ES-10	Maireana	georgei				+	0.2	Very Good
	ES-10	Maireana	sedifolia			ES10.03	+	0.5	Very Good
	ES-10	Maireana	tomentosa			ES10.02	0.5	0.2	Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-10	Maireana	triptera			ES01.09	0.5	0.4	Very Good
	ES-10	Ptilotus	obovatus				1.5	0.5-1	Very Good
	ES-10	Scaevola	spinescens			ES02.17	+	0.5-1	Very Good
	ES-10	Scaevola	spinescens				2	0.5-1	Very Good
	ES-10	Sclerolaena	diacantha			ES10.01	0.5	0.2	Very Good
	ES-10	Sclerolaena	drummondii			ES01.01	+	0.2	Very Good
	ES-10	Sclerolaena	fusiformis			ES02.15	+	0.2	Very Good
	ES-10	Senna	artemisioides	subsp.	filifolia	ES01.03A	0.5	1.5	Very Good
	ES-10	Templetonia	ceracea			ES10.04	+	1	Very Good
	ES-10	Zygophyllum		sp.	indet			0.1	Very Good
	ES-11	Atriplex	codonocarpa			ES11.15	+	0.25	Very Good
	ES-11	Atriplex	nummularia	subsp.	spathulata	ES11.05	1	1.5	Very Good
	ES-11	Atriplex	vesicaria			ES11.12	4	0.5	Very Good
	ES-11	Chenopodium	gaudichaudianum			ES11.03	+	0.4	Very Good
	ES-11	Enchylaena	tomentosa				0.5	0.4	Very Good
	ES-11	Eremophila	decipiens	subsp.	decipiens	ES11.10	+	1.5	Very Good
OPP COLL	ES-11	Eremophila	maculata	subsp.	brevifolia	ES11.13			Very Good
	ES-11	Eremophila	maculata	subsp.	brevifolia	ES11.14	+	0.5	Very Good
	ES-11	Eremophila	scoparia			ES14.02	2	1-2	Very Good
	ES-11	Eriochiton	sclerolaenoides			ES11.08	+	0.2	Very Good
OPP COLL	ES-11	Eucalyptus	salmonophloia			ES01.03			Very Good
	ES-11	Eucalyptus	salubris			ES11.06	13	7-12	Very Good
	ES-11	Exocarpos	aphyllus			ES14.09	+	0.5	Very Good
	ES-11	Frankenia	interioris			ES11.07	+	0.3	Very Good
	ES-11	Maireana	pyramidata			ES11.02	2	0.5-1	Very Good
	ES-11	Maireana	sedifolia			ES02.12	+	0.4-1	Very Good
	ES-11	Maireana	tomentosa			ES10.02	0.5	0.2	Very Good
	ES-11	Maireana	trichoptera			ES11.01	0.5	0.2	Very Good
	ES-11	Maireana	triptera				0.5	0.4	Very Good
	ES-11	Maireana	villosa			ES11.16	0.5	0.3	Very Good
	ES-11	Ptilotus	obovatus				+	0.5	Very Good
OPP COLL	ES-11	Santalum	acuminatum						Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
OPP COLL	ES-11	Scaevola	spinescens						Very Good
	ES-11	Sclerolaena	cuneata			ES11.11	+	0.3	Very Good
	ES-11	Sclerolaena	cuneata			ES11.17	+	0.2	Very Good
	ES-11	Sclerolaena	diacantha			ES11.04	1	0.2	Very Good
	ES-11	Sclerolaena	drummondii			ES22.04	0.5	0.2	Very Good
	ES-11	Sclerolaena	obliquicuspis			ES11.09	+	0.2	Very Good
	ES-11	Senna	artemisioides	subsp.	filifolia	ES01.03A	+	0.5-1	Very Good
OPP COLL	ES-11	Senna	artemisioides	subsp.	filifolia	ES07.08			Very Good
	ES-11	Senna	artemisioides	subsp.	filifolia	ES11.18	+	0.5	Very Good
OPP COLL	ES-11	Senna	cardiosperma						Very Good
OPP COLL	ES-11	Solanum	nummularia			ES03.10			Very Good
OPP COLL	ES-11	Solanum	orbiculatum			ES11.19			Very Good
	ES-12	Acacia	aptaneura			ES12.03	2	2-5	Very Good
	ES-12	Acacia	burkittii			ES02.10	40	2-4	Very Good
	ES-12	Acacia	hemiteles			ES05.03	1	1-2	Very Good
	ES-12	Acacia	tetragonophylla				1	2	Very Good
	ES-12	Atriplex	vesicaria			ES11.12	1	0.5-1	Very Good
	ES-12	Dodonaea	lobulata			ES02.05	+	1-2	Very Good
	ES-12	Dodonaea	rigida			ES12.02	+	1-1.5	Very Good
	ES-12	Enchylaena	tomentosa				0.5	0.5-1	Very Good
	ES-12	Eucalyptus	concinna			ES12.01	10	6-8	Very Good
	ES-12	Eucalyptus	salmonophloia			ES01.03	2	10	Very Good
	ES-12	Eucalyptus	salubris			ES11.06	35	6-8	Very Good
	ES-12	Marsdenia	australis				+	Cl	Very Good
	ES-12	Pittosporum	angustifolium			ES03.04	+	1-2	Very Good
	ES-12	Ptilotus	obovatus				0.5	0.5	Very Good
	ES-12	Senna	artemisioides	subsp.	filifolia	ES01.03A	5	1-1.5	Very Good
	ES-13	Acacia	? incurvaneura x mulganeura			ES17.03		7	Very Good
	ES-13	Acacia	burkittii			ES02.10	5	2-4	Very Good
	ES-13	Acacia	duriuscula			ES13.01	3	2-4	Very Good
	ES-13	Acacia	hemiteles			ES05.03	+	1-2	Very Good
	ES-13	Acacia	incurvaneura			ES13.03	2	2-5	Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
OPP COLL	ES-13	Acacia	mulganeura			ES23.02			Very Good
	ES-13	Acacia	tetragonophylla				1	2-3	Very Good
	ES-13	Amyema	fitzgeraldii			ES13.02	+	Par	Very Good
	ES-13	Atriplex	vesicaria			ES11.12	0.5	0.5	Very Good
	ES-13	Casuarina	pauper			ES13.04	1	8-10	Very Good
	ES-13	Casuarina	pauper			ES13.05	1	12	Very Good
	ES-13	Eremophila	granitica			ES06.05	1	0.5-1.5	Very Good
	ES-13	Eremophila	latrobei	subsp.	latrobei		0.5	1-2	Very Good
	ES-13	Eremophila	pantonii			ES13.06	+	0.5	Very Good
	ES-13	Eucalyptus	concinna			ES12.01	4	6-10	Very Good
OPP COLL	ES-13	Eucalyptus	longissima			ES04.01			Very Good
	ES-13	Maireana	trichoptera			ES11.01	+	0.2	Very Good
	ES-13	Maireana	villosa			ES01.15	+	0.3	Very Good
	ES-13	Marsdenia	australis				+	Cl	Very Good
OPP COLL	ES-13	Olearia	muelleri						Very Good
	ES-13	Ptilotus	obovatus				1	0.5	Very Good
	ES-13	Scaevola	spinescens				0.5	0.5-1	Very Good
	ES-13	Senna	artemisioides	subsp.	filifolia	ES01.03A	2	1.5	Very Good
	ES-13	Solanum	lasiophyllum				+	0.3	Very Good
OPP COLL	ES-14	Acacia	duriuscula			ES13.01			Very Good
	ES-14	Acacia	hemiteles			ES05.03	1		Very Good
	ES-14	Acacia	oswaldii			ES14.08	+		Very Good
	ES-14	Atriplex	vesicaria			ES11.12	1		Very Good
	ES-14	Dodonaea	lobulata			ES02.05	+		Very Good
	ES-14	Eragrostis	dielsii				+	0.1	Very Good
	ES-14	Eremophila	decipiens	subsp.	decipiens	ES11.10	+	1.5	Very Good
	ES-14	Eremophila	interstans	subsp.	interstans	ES14.01	3	2-4	Very Good
	ES-14	Eremophila	oldfieldii	subsp.	angustifolia	ES14.05	+	2	Very Good
	ES-14	Eremophila	pantonii			ES14.03	2.5	1-2	Very Good
	ES-14	Eremophila	parvifolia	subsp.	auricampa	ES06.03	1		Very Good
	ES-14	Eremophila	scoparia			ES14.02	3	2-3	Very Good
	ES-14	Eriochiton	sclerolaenoides			ES11.08	+		Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-14	Eucalyptus	celastroides	subsp.	celastroides	ES14.06	2	4-7	Very Good
	ES-14	Eucalyptus	concinna			ES12.01	2	4-7	Very Good
	ES-14	Eucalyptus	lesouefii			ES14.04	2	8	Very Good
	ES-14	Eucalyptus	salubris			ES11.06	6		Very Good
	ES-14	Exocarpos	aphyllus			ES14.09	+		Very Good
	ES-14	Maireana	sedifolia			ES02.12	+		Very Good
	ES-14	Maireana	trichoptera			ES11.01	1		Very Good
	ES-14	Maireana	triptera				1		Very Good
	ES-14	Maireana	triptera				+	0.3	Very Good
	ES-14	Maireana	villosa			ES01.15	+		Very Good
	ES-14	Olearia	muelleri				+	0.4	Very Good
	ES-14	Ptilotus	obovatus				0.5		Very Good
	ES-14	Scaevola	spinescens				1	0.5	Very Good
	ES-14	Sclerolaena	diacantha			ES11.04	1		Very Good
	ES-14	Sclerolaena	diacantha			ES14.07	+	0.2	Very Good
	ES-14	Sclerolaena	obliquicuspis			ES11.09	+		Very Good
	ES-14	Senna	artemisioides	subsp.	filifolia	ES01.03A	20		Very Good
OPP COLL	ES-14	Senna	cardiosperma						Very Good
	ES-15	Acacia	? incurvaneura x mulganeura			ES17.03	1	8	Very Good
	ES-15	Acacia	burkittii			ES02.10	2	1-2	Very Good
	ES-15	Acacia	duriuscula			ES07.06	6	1-2	Very Good
	ES-15	Acacia	mulganeura			ES23.02	1	6	Very Good
OPP COLL	ES-15	Acacia	oswaldii			ES15.01			Very Good
	ES-15	Acacia	tetragonophylla				1		Very Good
OPP COLL	ES-15	Alectryon	oleifolius	subsp.	oleifolius	ES08.02			Very Good
	ES-15	Alyxia	buxifolia			ES07.04	+		Very Good
	ES-15	Casuarina	pauper			ES13.04	4		Very Good
	ES-15	Dodonaea	lobulata			ES02.05	8		Very Good
	ES-15	Eremophila	decipiens	subsp.	decipiens	ES11.10	+	1.5	Very Good
	ES-15	Eremophila	glabra	subsp.	glabra	ES02.08	+	0.5-1.5	Very Good
OPP COLL	ES-15	Eremophila	longifolia						Very Good
	ES-15	Eremophila	oldfieldii	subsp.	angustifolia	ES14.05	1		Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
OPP COLL	ES-15	Exocarpos	aphyllus			ES14.09			Very Good
	ES-15	Maireana	georgei						Very Good
	ES-15	Marsdenia	australis				1	Cl	Very Good
	ES-15	Olearia	muelleri				+		Very Good
OPP COLL	ES-15	Philotheca	brucei						Very Good
	ES-15	Ptilotus	obovatus				6		Very Good
	ES-15	Scaevola	spinescens				4		Very Good
	ES-15	Senna	artemisioides	subsp.	filifolia	ES01.03A	20		Very Good
	ES-15	Templetonia	incrassata			ES02.06	+		Very Good
	ES-16	Acacia	burkittii			ES02.10	10		Very Good
	ES-16	Acacia	duriuscula			ES07.06	3		Very Good
	ES-16	Acacia	duriuscula			ES13.01	+		Very Good
	ES-16	Acacia	tetragonophylla				1		Very Good
	ES-16	Alyxia	buxifolia			ES07.04	+		Very Good
OPP COLL	ES-16	Casuarina	pauper			ES13.04			Very Good
	ES-16	Casuarina	pauper			ES13.05	5		Very Good
	ES-16	Dodonaea	lobulata			ES02.05	2		Very Good
OPP COLL	ES-16	Dodonaea	rigida			ES07.03			Very Good
	ES-16	Eremophila	georgei			ES17.01	0.5		Very Good
	ES-16	Eremophila	oldfieldii	subsp.	angustifolia	ES17.04	2		Very Good
OPP COLL	ES-16	Eucalyptus	longissima			ES04.01			Very Good
	ES-16	Marsdenia	australis				+		Very Good
	ES-16	Olearia	muelleri				0.5		Very Good
	ES-16	Philotheca	brucei				0.5		Very Good
OPP COLL	ES-16	Prostanthera	althoferi	subsp.	althoferi	ES07.07			Very Good
	ES-16	Ptilotus	obovatus				+		Very Good
	ES-16	Santalum	spicatum				1		Very Good
	ES-16	Scaevola	spinescens				5		Very Good
	ES-16	Senna	artemisioides	subsp.	filifolia	ES01.03A	1		Very Good
	ES-16	Templetonia	incrassata			ES02.06	+		Very Good
	ES-17	Acacia	? incurvaneura x mulganeura			ES17.03	3		Very Good
	ES-17	Acacia	burkittii			ES02.10	1		Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-17	Acacia	duriuscula			ES07.06	7		Very Good
	ES-17	Acacia	mulganeura			ES23.02	3		Very Good
	ES-17	Acacia	tetragonophylla				2		Very Good
	ES-17	Alyxia	buxifolia			ES07.04			Very Good
	ES-17	Casuarina	pauper			ES13.04	0.5		Very Good
	ES-17	Casuarina	pauper			ES17.02	4		Very Good
	ES-17	Dodonaea	lobulata			ES02.05	5		Very Good
	ES-17	Dodonaea	rigida			ES07.03			Very Good
	ES-17	Eremophila	decipiens	subsp.	decipiens	R3			Very Good
	ES-17	Eremophila	georgei			ES17.01			Very Good
	ES-17	Eremophila	granitica			ES06.05	2		Very Good
	ES-17	Eremophila	oldfieldii	subsp.	angustifolia	ES17.04	2		Very Good
	ES-17	Eremophila	oppositifolia	subsp.	angustifolia	R2			Very Good
	ES-17	Eucalyptus	longissima			ES04.01	1		Very Good
	ES-17	Marsdenia	australis						Very Good
	ES-17	Olearia	muelleri						Very Good
	ES-17	Prostanthera	althoferi	subsp.	althoferi	ES07.07	1		Very Good
OPP COLL	ES-17	Psydrax	suaveolens						Very Good
	ES-17	Philotheca	brucei				2		Very Good
OPP COLL	ES-17	Santalum	spicatum						Very Good
	ES-17	Scaevola	spinescens				5		Very Good
	ES-17	Senna	artemisioides	subsp.	filifolia	ES01.03A	+		Very Good
	ES-18	Acacia	? incurvaneura x mulganeura			ES17.03	2		Excellent
	ES-18	Acacia	burkittii			ES02.10	1		Excellent
	ES-18	Acacia	duriuscula			ES07.06	4		Excellent
	ES-18	Acacia	hemiteles			ES05.03	1		Excellent
	ES-18	Acacia	incurvaneura			ES18.03	6		Excellent
	ES-18	Acacia	mulganeura			ES23.02	2		Excellent
	ES-18	Acacia	tetragonophylla				+		Excellent
OPP COLL	ES-18	Casuarina	pauper			ES13.04			Excellent
	ES-18	Eremophila	granitica			ES18.01	+		Excellent
	ES-18	Eremophila	pantonii			ES14.03	1		Excellent

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
OPP COLL	ES-18	Eucalyptus	concinna			ES12.01			Excellent
	ES-18	Eucalyptus	longissima			ES04.01	17		Excellent
	ES-18	Maireana	triptera						Excellent
	ES-18	Maireana	villosa			ES01.15	+		Excellent
	ES-18	Ptilotus	obovatus				1		Excellent
OPP COLL	ES-18	Rhagodia	spinescens			ES18.02			Excellent
	ES-18	Scaevola	spinescens						Excellent
	ES-18	Senna	artemisioides	subsp.	filifolia	ES01.03A	2		Excellent
	ES-19	Acacia	duriuscula			ES07.06	20		Very Good
	ES-19	Acacia	incurvaneura			ES13.03	30		Very Good
	ES-19	Acacia	mulganeura			ES23.02	0.5		Very Good
	ES-19	Acacia	tetragonophylla				2		Very Good
	ES-19	Casuarina	pauper			ES13.04	0.5		Very Good
	ES-19	Dodonaea	lobulata			ES02.05	2		Very Good
	ES-19	Enchylaena	tomentosa	var.	tomentosa	ES19.02	+		Very Good
	ES-19	Eremophila	decipiens	subsp.	decipiens	ES19.01	+		Very Good
	ES-19	Eremophila	granitica			ES06.05	+		Very Good
	ES-19	Eremophila	oldfieldii	subsp.	angustifolia	ES19.03	+		Very Good
	ES-19	Eremophila	pantonii			ES14.03	+		Very Good
	ES-19	Eucalyptus	salmonophloia			ES01.03	+		Very Good
	ES-19	Grevillea	nematophylla	subsp.	nematophylla	ES04.04	+		Very Good
	ES-19	Ptilotus	obovatus				1		Very Good
OPP COLL	ES-19	Santalum	spicatum						Very Good
	ES-19	Scaevola	spinescens				3		Very Good
	ES-19	Senna	artemisioides	subsp.	filifolia	ES01.03A	4		Very Good
	ES-20	Acacia	hemiteles			ES05.03	+		Very Good
	ES-20	Acacia	oswaldii			ES23.04	+		Very Good
	ES-20	Acacia	tetragonophylla				0.5		Very Good
OPP COLL	ES-20	Atriplex	nummularia	subsp.	spathulata	ES11.05			Very Good
	ES-20	Austrostipa		sp.	indet.	ES20.02	+		Very Good
	ES-20	Eremophila	decipiens	subsp.	decipiens	ES20.04	+		Very Good
	ES-20	Eremophila	pantonii			ES14.03	0.5		Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-20	Eremophila	scoparia			ES14.02	2		Very Good
	ES-20	Eucalyptus	salmonophloia				7		Very Good
	ES-20	Eucalyptus	transcontinentalis			ES24.01	7		Very Good
	ES-20	Eucalyptus	yilgarnensis			R4			Very Good
	ES-20	Maireana	villosa			ES01.15	+		Very Good
	ES-20	Ptilotus	obovatus				+		Very Good
	ES-20	Scaevola	spinescens				+		Very Good
	ES-20	Sclerolaena	diacantha			ES20.01	+		Very Good
	ES-20	Senna	artemisioides	subsp.	filifolia	ES01.03A	1.5		Very Good
	ES-20	Senna	artemisioides	subsp.	filifolia	ES20.03	0.5		Very Good
	ES-20	Senna	cardiosperma				5	1-2	Very Good
	ES-21	Acacia	burkittii			ES02.10	1		Very Good
	ES-21	Acacia	duriuscula			ES07.06	6		Very Good
	ES-21	Acacia	incurvaneura			ES27.01	2		Very Good
	ES-21	Acacia	mulganeura			ES23.02	1		Very Good
	ES-21	Acacia	tetragonophylla				4		Very Good
	ES-21	Alectryon	oleifolius	subsp.	oleifolius	ES08.02	+		Very Good
	ES-21	Alyxia	buxifolia			ES07.04	1		Very Good
	ES-21	Casuarina	pauper			ES13.04	2.5		Very Good
	ES-21	Casuarina	pauper			ES13.05	4		Very Good
	ES-21	Dodonaea	lobulata			ES02.05	8		Very Good
	ES-21	Dodonaea	rigida			ES07.03	+		Very Good
	ES-21	Eremophila	alternifolia			ES21.05	1	1-2	Very Good
	ES-21	Eremophila	glabra	subsp.	glabra	ES02.08	+		Very Good
	ES-21	Eremophila	granitica			ES06.05	+		Very Good
	ES-21	Eremophila	oldfieldii	subsp.	angustifolia	ES21.08	+	1.5-2.5	Very Good
	ES-21	Eremophila	oppositifolia	subsp.	angustifolia	ES21.03	2		Very Good
	ES-21	Eremophila	oppositifolia	subsp.	angustifolia	ES21.06	3	1-2.5	Very Good
	ES-21	Eremophila	pantonii			ES14.03	5		Very Good
	ES-21	Eremophila	parvifolia	subsp.	auricampa	ES06.03	1		Very Good
	ES-21	Hakea	recurva	subsp.	arida	ES21.04	+		Very Good
	ES-21	Lysiana		cf.	exocarpi	ES21.07	+		Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-21	Marsdenia	australis						Very Good
	ES-21	Olearia	muelleri			ES21.02	3		Very Good
	ES-21	Prostanthera	althoferi	subsp.	althoferi	ES07.07	1		Very Good
	ES-21	Prostanthera	grylloana			ES21.01	+		Very Good
	ES-21	Psydrax	suaveolens						Very Good
	ES-21	Ptilotus	obovatus				2		Very Good
	ES-21	Santalum	spicatum				2		Very Good
	ES-21	Scaevola	spinescens			ES02.17	1		Very Good
	ES-21	Scaevola	spinescens				4		Very Good
	ES-21	Senna	artemisioides	subsp.	filifolia	ES01.03A	3		Very Good
OPP COLL	ES-21	Senna	artemisioides	subsp.	filifolia	ES20.03			Very Good
	ES-22	Atriplex	nummularia	subsp.	spathulata	ES11.05			Very Good
	ES-22	Atriplex	vesicaria			ES11.12	+		Very Good
	ES-22	Enchylaena	tomentosa				1		Very Good
	ES-22	Eremophila	maculata	subsp.	brevifolia	ES22.01	1.5		Very Good
	ES-22	Eremophila	scoparia			ES14.02	1		Very Good
	ES-22	Eucalyptus	salubris			ES11.06	20		Very Good
OPP COLl	ES-22	Frankenia	interioris			ES22.02			Very Good
	ES-22	Maireana	pyramidata			ES11.02	+		Very Good
	ES-22	Maireana	sedifolia			ES02.12	+		Very Good
	ES-22	Maireana	tomentosa			ES01.11	+		Very Good
	ES-22	Maireana	trichoptera			ES11.01	0.5		Very Good
	ES-22	Maireana	triptera				+		Very Good
	ES-22	Ptilotus	obovatus				1		Very Good
OPP COLl	ES-22	Salsola	australis						Very Good
	ES-22	Sclerolaena	diacantha			ES11.04	0.5		Very Good
	ES-22	Sclerolaena	drummondii			ES22.04	+		Very Good
	ES-22	Sclerolaena	fusiformis			ES02.15	0.5		Very Good
	ES-22	Sclerolaena	obliquicuspis			ES22.03	0.5		Very Good
	ES-23	Acacia	? incurvaneura x mulganeura			ES23.01	20		Excellent
	ES-23	Acacia	burkittii			ES02.10	7		Excellent
	ES-23	Acacia	duriuscula			ES07.06	5		Excellent

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-23	Acacia	mulganeura			ES23.02	20		Excellent
	ES-23	Acacia	oswaldii			ES23.04	+		Excellent
	ES-23	Acacia	tetragonophylla				5	3-5	Excellent
	ES-23	Alectryon	oleifolius	subsp.	oleifolius	ES08.02	+		Excellent
OPP COLL	ES-23	Casuarina	pauper			ES13.05			Excellent
	ES-23	Chenopodium	gaudichaudianum			ES11.03	+		Excellent
	ES-23	Dodonaea	lobulata			ES02.05	+		Excellent
	ES-23	Enchylaena	tomentosa				+		Excellent
	ES-23	Eremophila	decipiens	subsp.	decipiens	ES23.06	+		Excellent
	ES-23	Eremophila	glabra	subsp.	glabra	ES23.05	+		Excellent
	ES-23	Eucalyptus	concinna			ES12.01	4		Excellent
	ES-23	Eucalyptus	longissima			ES23.03	1		Excellent
	ES-23	Grevillea	nematophylla	subsp.	nematophylla	ES04.04	8		Excellent
	ES-23	Rhagodia	spinescens			ES18.02	+		Excellent
	ES-23	Scaevola	spinescens				+	1-2	Excellent
	ES-23	Senna	artemisioides	subsp.	filifolia	ES20.03	1	1-2	Excellent
	ES-23	Templetonia	incrassata			ES02.06	+		Excellent
	ES-24	Acacia	burkittii			ES02.10	+		Very Good
	ES-24	Acacia	duriuscula			ES07.06	4		Very Good
	ES-24	Atriplex	vesicaria			ES11.12	+		Very Good
	ES-24	Casuarina	pauper			ES13.04	2		Very Good
	ES-24	Casuarina	pauper			ES13.05	1		Very Good
	ES-24	Dodonaea	lobulata			ES02.05	+		Very Good
	ES-24	Eremophila	parvifolia	subsp.	auricampa	ES06.03	+		Very Good
	ES-24	Eremophila	scoparia			ES14.02	2		Very Good
	ES-24	Eucalyptus	salmonophloia			ES01.03	1		Very Good
	ES-24	Eucalyptus	transcontinentalis			ES24.01	15		Very Good
	ES-24	Maireana	sedifolia			ES02.12	+		Very Good
	ES-24	Maireana	tomentosa			ES10.02	+		Very Good
	ES-24	Maireana	triptera				+		Very Good
	ES-24	Ptilotus	obovatus				+		Very Good
	ES-24	Scaevola	spinescens				+		Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-24	Sclerolaena	diacantha			ES11.04	+		Very Good
	ES-24	Senna	artemisioides	subsp.	filifolia	ES01.03A	2		Very Good
	ES-24	Senna	cardiosperma				+		Very Good
	ES-25	Acacia	duriuscula			ES07.01	+		Good
	ES-25	Acacia	tetragonophylla				+		Good
	ES-25	Atriplex	nummularia	subsp.	spathulata	ES11.05	+		Good
	ES-25	Casuarina	pauper			ES13.04	2		Good
	ES-25	Casuarina	pauper			ES25.01	+		Good
	ES-25	Dodonaea	lobulata			ES02.05	+		Good
	ES-25	Eremophila	glabra	subsp.	glabra	ES25.03	3		Good
	ES-25	Eremophila	oppositifolia	subsp.	angustifolia	ES21.03	+		Good
	ES-25	Eremophila	pantonii			ES14.03	3		Good
	ES-25	Eremophila	parvifolia	subsp.	auricampa	ES25.02	+		Good
OPP COLL	ES-25	Eucalyptus	celastroides	subsp.	celastroides	ES25.01	2		Good
	ES-25	Eucalyptus	lesouefii			ES14.04	5		Good
	ES-25	Maireana	pentatropis			ES25.04	+		Good
	ES-25	Maireana	sedifolia			ES02.12	2		Good
	ES-25	Maireana	villosa			ES01.15	+		Good
	ES-25	Olearia	muelleri				+		Good
	ES-25	Ptilotus	obovatus				+		Good
	ES-25	Scaevola	spinescens				2		Good
	ES-25	Sclerolaena	drummondii			ES22.04	2		Good
	ES-25	Senna	artemisioides	subsp.	filifolia	ES01.03A	+		Good
	ES-25	Templetonia	incrassata			ES02.06	+		Good
	ES-26	Acacia	burkittii			ES02.10	+		Very Good
	ES-26	Acacia	duriuscula			ES02.02	20		Very Good
	ES-26	Acacia	mulganeura			ES26.03	+		Very Good
	ES-26	Acacia	tetragonophylla				2		Very Good
	ES-26	Alyxia	buxifolia			ES07.04	+		Very Good
	ES-26	Casuarina	pauper			ES13.04	2		Very Good
	ES-26	Dodonaea	lobulata			ES02.05	5		Very Good
	ES-26	Dodonaea	rigida			ES07.03	+		Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-26	Eremophila	granitica			ES06.05	1		Very Good
	ES-26	Eremophila	granitica			ES26.01	2		Very Good
	ES-26	Eucalyptus	longissima			ES04.01	2		Very Good
	ES-26	Marsdenia	australis				+	Cl	Very Good
	ES-26	Ptilotus	obovatus				+		Very Good
	ES-26	Santalum	spicatum				2		Very Good
	ES-26	Scaevola	spinescens				4	0.5-1	Very Good
	ES-26	Senna	artemisioides	subsp.	filifolia	ES20.03	+		Very Good
	ES-26	Triodia	scariosa			ES26.02	+		Very Good
	ES-27	Acacia	? incurvaneura x mulganeura			ES23.01	2		Good
	ES-27	Acacia	duriuscula			ES07.06	5		Good
	ES-27	Acacia	hemiteles			ES05.03	1		Good
	ES-27	Acacia	incurvaneura			ES27.01	15		Good
	ES-27	Alectryon	oleifolius	subsp.	oleifolius	ES08.02	+		Good
	ES-27	Casuarina	pauper			ES13.04	2		Good
	ES-27	Casuarina	pauper			ES13.05	1		Good
	ES-27	Dodonaea	lobulata			ES02.05	3		Good
	ES-27	Dodonaea	rigida			ES07.03	+		Good
	ES-27	Eremophila	granitica			ES06.05	+		Good
	ES-27	Eremophila	granitica			ES06.05	+		Good
	ES-27	Eucalyptus	longissima			ES04.01	0.5		Good
	ES-27	Eucalyptus	salmonophloia			ES01.03	1		Good
	ES-27	Pittosporum	angustifolium			ES03.04	+		Good
	ES-27	Ptilotus	obovatus				1		Good
	ES-27	Scaevola	spinescens				4		Good
	ES-27	Senna	artemisioides	subsp.	filifolia	ES01.03A	3		Good
	ES-27	Senna	artemisioides	subsp.	filifolia	ES20.03	+		Good
	ES-27	Solanum	nummularia			ES03.10	+		Good
	ES-28	Acacia	duriuscula			ES02.02	5		Very Good
	ES-28	Acacia	hemiteles			ES05.03	+		Very Good
	ES-28	Acacia	tetragonophylla				1		Very Good
OPP COLL	ES-28	Alectryon	oleifolius	subsp.	oleifolius	ES08.02			Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
OPP COLL	ES-28	Atriplex	nummularia	subsp.	spathulata	ES11.05			Very Good
	ES-28	Atriplex	vesicaria			ES11.12	2		Very Good
	ES-28	Casuarina	pauper			ES13.04	3		Very Good
	ES-28	Dodonaea	lobulata			ES02.05	5		Very Good
	ES-28	Eremophila	oppositifolia	subsp.	angustifolia	ES28.01	+		Very Good
	ES-28	Eremophila	pantonii			ES14.03	4		Very Good
	ES-28	Eremophila	parvifolia	subsp.	auricampa	ES25.02	+		Very Good
	ES-28	Maireana	sedifolia			ES02.12	+		Very Good
	ES-28	Maireana	triptera			ES01.09	+		Very Good
	ES-28	Ptilotus	obovatus				3		Very Good
	ES-28	Scaevola	spinescens				4		Very Good
	ES-28	Senna	artemisioides	subsp.	filifolia	ES01.03A	5		Very Good
	ES-28	Templetonia	incrassata			ES02.06	+		Very Good
	ES-29	Acacia	burkittii			ES02.10	+		Very Good
	ES-29	Acacia	duriuscula			ES07.06	8		Very Good
	ES-29	Acacia	kalgoorliensis			ES06.01	5		Very Good
	ES-29	Acacia	tetragonophylla						Very Good
	ES-29	Alectryon	oleifolius	subsp.	oleifolius	ES08.02	+		Very Good
	ES-29	Alyxia	buxifolia			ES07.04	+		Very Good
	ES-29	Austrostipa		sp.	indet.	ES20.02	+		Very Good
	ES-29	Casuarina	pauper			ES13.04	1		Very Good
	ES-29	Dodonaea	lobulata			ES02.05	3		Very Good
	ES-29	Eremophila	decipiens	subsp.	decipiens	ES29.01	+		Very Good
	ES-29	Eremophila	glabra	subsp.	glabra	ES02.08	+		Very Good
	ES-29	Eremophila	oldfieldii	subsp.	angustifolia	ES21.08	+		Very Good
	ES-29	Eremophila	oldfieldii	subsp.	angustifolia	ES26.04	+		Very Good
	ES-29	Eremophila	parvifolia	subsp.	auricampa	ES06.03	1		Very Good
	ES-29	Maireana	sedifolia			ES02.12	+		Very Good
	ES-29	Ptilotus	obovatus						Very Good
	ES-29	Scaevola	spinescens				4		Very Good
	ES-29	Senna	artemisioides	subsp.	filifolia	ES01.03A	4		Very Good
	ES-29	Templetonia	incrassata			ES02.06	+		Very Good

SURVEY_ID	SITE_ID	GENUS	SPECIES	INF_RANK	INF_NAME	VOUCH_NO	COVERAGE	PLANT_HEI	VEG_COND
	ES-29	Westringia	rigida			ES05.02	2		Very Good
	ES-30	Acacia	duriuscula			ES07.06	4		Good
	ES-30	Acacia	hemiteles			ES05.03	+		Good
	ES-30	Acacia	tetragonophylla				+		Good
	ES-30	Alectryon	oleifolius	subsp.	oleifolius	ES08.02	+		Good
	ES-30	Casuarina	pauper			ES13.04	1		Good
	ES-30	Dodonaea	lobulata			ES02.05	6		Good
	ES-30	Eremophila	glabra	subsp.	glabra	ES02.08	+		Good
	ES-30	Eremophila	oldfieldii	subsp.	angustifolia	ES21.08	+		Good
	ES-30	Eremophila	pantonii			ES14.03	+		Good
	ES-30	Maireana	georgei				+		Good
	ES-30	Ptilotus	obovatus				+		Good
	ES-30	Scaevola	spinescens			ES02.17	+		Good
	ES-30	Scaevola	spinescens				5		Good
	ES-30	Senna	artemisioides	subsp.	filifolia	ES01.03A	7		Good
	ES-30	Templetonia	incrassata			ES02.06	+		Good

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APPENDIX 12

Vertebrate fauna list from the study area

REPTILES

Family Species	COMMON NAME
AGAMIDAE	**Dragon Lizards**
Ctenophorus cristatus	Crested Dragon
Ctenophorus reticulatus	Reticulated Dragon
Ctenophorus scutulatus	Lozenge-Marked Dragon
Pogona minor minor	Dwarf Bearded Dragon
GEKKONIDAE	**Geckos**
Diplodactylus pulcher	
Gehyra purpurascens	
Gehyra variegata	Tree Dtella
Heteronotia binoei	Bynoe's Gecko
Rhynchoedura ornata	Beaked Gecko
Underwoodisaurus milii	Thick-Tailed Gecko (Leaf-Tailed Gecko)
PYGOPODIDAE	**Legless Lizards**
Delma butleri	Butler's Legless Lizard
Lialis burtonis	Burton's Legless Lizard
SCINCIDAE	**Skinks**
Ctenotus leonhardii	
Ctenotus schomburgkii	
Menetia greyii	
Morethia butleri	
Tiliqua occipitalis	Western Blue-Tongued Lizard
Tiliqua rugosa rugosa	Bobtail
VARANIDAE	**Monitor Lizards**
Varanus gouldii	Gould's Goanna, Sand Monitor, Bungarra

MAMMALS * Indentified by secondary evidence

Family Species	COMMON NAME
CAMELIDAE	**Camels**
Camelus dromedarius	One-Humped Camel*
CANIDAE	**Dogs**
Canis familiaris dingo	Dingo*
MACROPODIDAE	
Macropus fuliginosus	Western Grey Kangaroo

BIRDS * Identified by secondary evidence

Family Species	COMMON NAME
Casuariidae	
Dromaius novaehollandiae	Emu
Accipitridae	
Aquila audax	Wedge-Tailed Eagle
Circus assimilis	Spotted Harrier
Haliastur sphenurus	Whistling Kite
Falconidae	
Falco berigora	Brown Falcon
Falco cenchroides	Australian Kestral
Falco longipennis	Australian Hobby
Megapodiidae	
Leipoa ocellata	Malleefowl*

Family Species	COMMON NAME
Charadriidae	
Peltohyas australis	Australian Dotterel
Columbidae	
Ocyphaps lophotes	Crested Pigeon
Phaps chalcoptera	Common Bronzewing
Psittacidae	
Melopsittacus undulatus	Budgerigar
Nymphicus hollandicus	Cockatiel
Platycercus varius	Mulga Parrot
Platycercus zonarius	Australian Ring-Necked Parrot
Cuculidae	
Chrysococcys basalis	Horsfields Bronze Cuckoo
Cuculus pallidus	Pallid Cuckoo
Alcedinidae	
Halcyon pyrrhopygia	Red-Backed Kingfisher
Alaudidae	
Mirafra javanica	Horsefield's Bushlark
Hirundinidae	
Hirundo nigricans	Tree Martin
Motacillidae	
Anthus novaeseelandiae	Richard's Pipit
Campephagidae	
Coracina maxima	Ground Cuckoo-Shrike
Lalage sueurii	White-Winged Triller
Pachycephalidae	
Colluricincla harmonica	Grey Shrike-Thrush
Microeca leucophaea	Jacky Winter
Oreoica gutturalis	Crested Bellbird
Pachycephala pectoralis	Rufous Whistler
Petroica cucullata	Hooded Robin
Petroica goodenovii	Red-Capped Robin
Monarchidae	
Rhipidura fuliginosa	Grey Fantail
Rhipidura rufiventris	Willie Wagtail
Orthonychidae	
Pomatostomus superciliosus	White-Browed Babbler
Acanthizidae	
Acanthiza apicalis	Broad-Tailed Thornbill
Acanthiza chrysorrhoa	Yellow-Rumped Thornbill
Aphelocephala leucopsis	Southern Whiteface
Pyrrholaemus brunneus	Redthroat
Smicrornis brevirostris	Weebill
Maluridae	
Malurus lambertii	Variegated Fairy-Wren
Malurus leucopterus	White-Winged Fairy-Wren
Sylviidae	
Cinclorhamphus cruralis	Brown Songlark
Daphoenosittidae	
Daphoenositta chrysoptera	Australian Sittella
Climacteridae	
Climacteris affinis	White-Browed Tree-Creeper
Climatcteris rufa	Rufous Treecreeper

Family Species	COMMON NAME
Dicaeidae	
Dicaeum hirundinaceum	Mistletoe Bird
Pardalotus substriatus	Striated Pardalote