



# Western Ridge Pipeline Reconnaissance Flora and Vegetation Survey

Biologic Environmental Survey

Report to BHP Western Australian Iron Ore

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## EXECUTIVE SUMMARY

BHP Western Australian Iron Ore (BHP WAIO) are investigating the biological values of potential pipeline options for the Western Ridge area to provide local and contextual information to inform future environmental approvals. BHP WAIO commissioned Biologic Environmental Survey to undertake a single season reconnaissance flora and vegetation survey of four separate portions totalling approximately 2,169 hectares (the Survey Area). The Survey Area is located within the Pilbara and Gascoyne bioregions, approximately 23 kilometres (km) southwest to 10 km east of Newman, and is partly located within BHP Iron Ore, and BHP Billiton Minerals tenements, encompassing off tenure and mining operational areas. Additionally, Biologic completed a concurrent reconnaissance flora and vegetation survey of an area immediately south of the Whaleback mine site (Paddy Bore Survey Area).

The reconnaissance flora and vegetation survey was undertaken over eight days between 24 and 31 March 2021, with a second field survey undertaken between 12 and 14 March 2022, both surveys being conducted during the wet season for the Pilbara. All major vegetation communities were visited and sampled. During the field surveys, daytime climatic conditions were hot temperatures with clear skies. Conditions within the Survey Area were relatively wet with a high number of annual/ biannual flora taxa growing at the time of each field survey.

The flora and vegetation of the Survey Area was sampled with 148 relevés, 46 mapping notes and opportunistic sampling. This data, along with an additional 21 relevé sites from the Paddy Bore Survey Area, was used to record and described the vegetation types and their condition, and to collect an inventory of flora taxa present.

A total of 279 confirmed vascular flora taxa from 38 families and 115 genera were recorded from the Survey Area, comprising 268 native taxa and 11 introduced taxa. With the inclusion of the confirmed vascular flora taxa recorded from the Paddy Bore Survey Area, the total number of confirmed vascular flora taxa across both Survey Areas increases to 295, comprising 284 native and 11 introduced taxa.

The desktop assessment identified 35 significant taxa which had varying likelihoods of occurring within the Survey Area. It was considered highly unlikely that any Threatened flora would occur within the Survey Area. One Priority Listed taxon was considered highly likely to occur, and two Priority Listed taxa were likely to occur. The remainder were ranked as possible, unlikely, or highly unlikely to occur within the Survey Area.

Two Priority Listed flora taxa were recorded within the Survey Area. During the survey, *Rhagodia* sp. Hamersley (M. Trudgen 17794) (P3) was recorded from 59-point locations with a total of 66 individuals. An additional priority listed taxon, *Ipomoea racemigera* (P2), was found by a subsequent survey conducted by Biologic for BHP WAIO that overlapped a portion of the current Survey Area, totalling 56 individuals from six-point locations. Suitable habitat for several significant taxa was identified from the Survey Area, however, no individuals were recorded. Due to the presence of suitable habitat and the low-intensity sampling of reconnaissance surveys, five taxa are still considered possible to occur within the Survey Area. An additional ten taxa were considered significant for other reasons, including seven range extensions, one hybrid and two species that filled substantial distribution gaps (locality holes).

Eleven introduced taxa, *\*Aerva javanica*, *\*Bidens bipinnata*, *\*Cenchrus ciliaris*, *\*Cenchrus setiger*, *\*Citrullus amarus*, *\*Cynodon dactylon*, *\*Echinochloa colona*, *\*Malvastrum americanum*, *\*Portulaca pilosa*, *\*Setaria verticillata*, and *\*Vachellia farnesiana* were recorded from the Survey Area. None are listed as Weeds of National Significance, Declared Pests, or considered to be of priority for management in the Pilbara region. The most frequently observed introduced taxa were *\*C. ciliaris* (54 sites and 63 opportunistic locations) and *\*B. bipinnata* (32 sites, as well as 10 opportunistic locations).

A total of 29 vegetation types from 18 broad floristic formations were described and delineated from the Survey Area. The dominant broad floristic formation was *Triodia* low hummock grassland which supported five vegetation types (707 ha or 33 %). The *Acacia*-dominated floristic formations (which included nine broad floristic formations) supported a total of 14 vegetation types which together made up approximately 50 % of the Survey Area (1,087 ha). Vegetation types were found across nine landforms, including stony plain, drainage area/ floodplain, hillcrest/ upper hillslope, hillslope and undulating low hill, calcrete plain, major drainage line, medium drainage line, minor drainage line and gilgai plain.

The vegetation types described from the Survey Area are not considered to be analogous with any known Threatened or Priority Ecological Communities occurring in the Pilbara region. Vegetation type GP ErIcSeao ErfcEnpoDish(±AselAspe) AaAte shares affinities with Priority one Priority Ecological Community (PEC), 'West-Angelas Cracking-Clays', due to its location on cracking-clays (gilgai plain) and presence of *Astrebla elymoides*, *Astrebla pectinata*, and *Sida fibulifera*. However, as these species did not form a dominant part of the vegetation structure (recorded as scattered) it was determined that this vegetation type does not represent the 'West-Angelas Cracking-Clays' PEC.

Five vegetation types within the Survey Area were considered significant for other reasons, including those considered to be 'ecosystems at risk' for the Hamersley subregion. These were SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri (analogous with grove/ inter-grove mulga, eastern Hamersley Range), FP AaAinAte(±ExEg) CcEnpoChf BbClvAbl, SP AaAptAp AteSeglErff EnpoCcArc, FP AaApAte SeglMam EnpoEmuAri Tp (analogous with valley floor mulga) and MA EcrEv AciAcp CcCsEuaMahElp (analogous with major ephemeral water courses).

Two mapped vegetation types, MA EcrEv AciAcp CcCsEuaMahElp and ME CcCsChf EvAci Aads, are considered to be groundwater dependent vegetation, due to the presence of *Eucalyptus camaldulensis* subsp. *refulgens*, *Eucalyptus victrix* and several other mesic-indicator flora. MA EcrEv AciAcp CcCsEuaMahElp is likely to have a moderate dependence on groundwater and may potentially represent a groundwater dependent ecosystem, whereas ME CcCsChf EvAci Aads is likely to have low groundwater-dependence and is unlikely to represent a groundwater dependent ecosystem. These vegetation types coincide with major and medium drainage lines that run through the Survey Area, and include the Fortescue River in the northeast, Gingianna Pool adjacent to Great Northern Hwy, Western Creek in the southwest portions, Whaleback Creek near Marble Bar Road, as well a number of unnamed rivers.

One mapped vegetation type, SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri, is considered to be a sheet-flow dependent ecosystem. This low woodland vegetation contained two mulga species,

*Acacia aptaneura* and *Acacia incurvaneura*, and exhibited distinct groving/ intergroving typical for landforms prone to overland sheet-flow of water. This vegetation type broadly aligned with the Spearhole Land System which is known to support sheet-flow ecosystems.

The condition of the vegetation in the Survey Area ranged from completely degraded to excellent, with the majority in good or better condition (88 %). The most common impacts to the vegetation were from cattle grazing and trampling, which is more evident across floodplains and drainage lines.

## 1 INTRODUCTION

### 1.1 Background

BHP Western Australian Iron Ore (BHP WAIO) are investigating the biological values of potential pipeline options for the Western Ridge area (hereafter referred to as the Survey Area) to provide local and contextual information to inform future environmental approvals. The Survey Area comprises four separate portions, referred to as the western, southwest, central, and northeast portions (from west to east across the Survey Area), and located approximately 23 kilometres (km) southwest to 10 km east of Newman and covers a total area of approximately 2,169 hectares (ha) (Figure 1.1).

To support future approvals, BHP WAIO commissioned Biologic Environmental Survey Pty Ltd (Biologic) to undertake a single season reconnaissance flora and vegetation survey of the Survey Area. The Survey Area is located within the Pilbara and Gascoyne bioregions (Figure 1.1), and is partly located within BHP Iron Ore, and BHP Billiton Minerals tenements, encompassing off tenure and mining operational areas (Figure 1.2). Biologic completed a concurrent reconnaissance flora and vegetation survey of an area adjacent to the Survey Area, immediately south of the Whaleback mine site, for which a separate memo report has been produced (referred to in this report as 'Paddy Bore Survey Area').

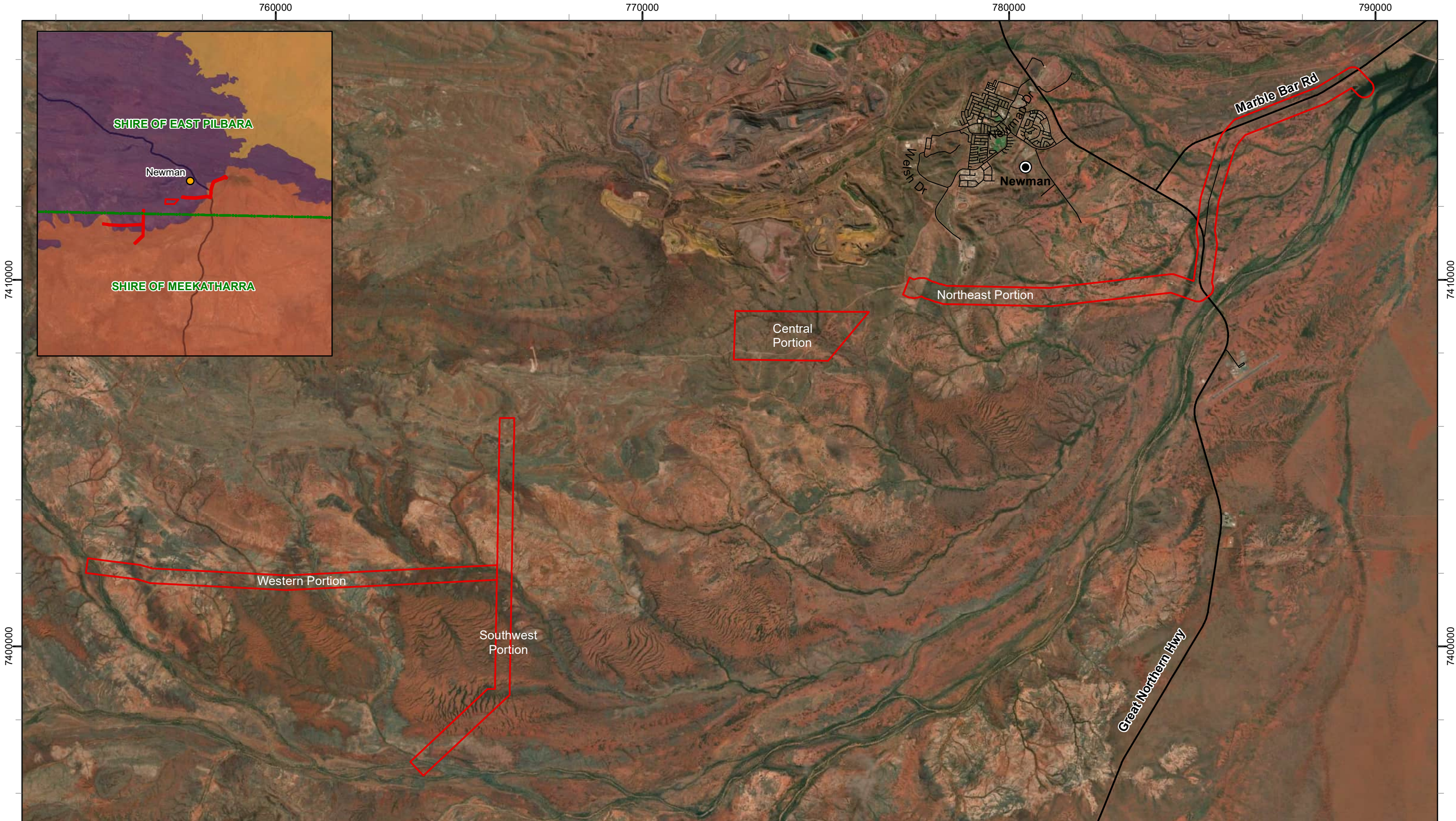
The flora and vegetation assessment does not apply to any specific development proposed by BHP WAIO; however, the assessment will be used to inform future environmental assessments within and more broadly in the vicinity of the Survey Area. This report documents the findings of this assessment, which consisted of a desktop assessment and field survey comprising a reconnaissance survey and limited targeted sampling.

### 1.2 Objectives

The overarching objective of the single season reconnaissance flora and vegetation survey (hereafter the Survey) was to identify the flora and vegetation values of the Survey Area and to determine if there are any significant values that need to be considered during any future environmental assessments across the Survey Area. The overarching objective was achieved via the following scope of works:

- The completion of a desktop assessment, including the review of previous biological surveys and government and non-government databases;
- The completion of a single season reconnaissance flora and vegetation survey across the Survey Area and relevant regional context;
- A review of the results of the flora and vegetation survey to determine if there are any significant environmental values within the Survey Area; and
- A discussion of the significant environmental values (and remaining environmental values) in a regional and local context.



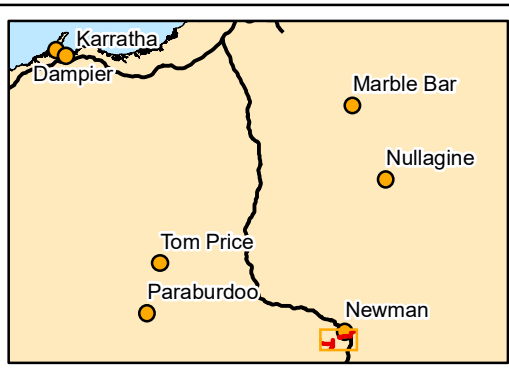


- Legend**
- Survey Area
  - Local Road
  - State Road
  - Local Government Authority
- IBRA Subregion**
- Augustus
  - Fortescue
  - Hamersley

Scale: 1:96,500

0 2 4 Km

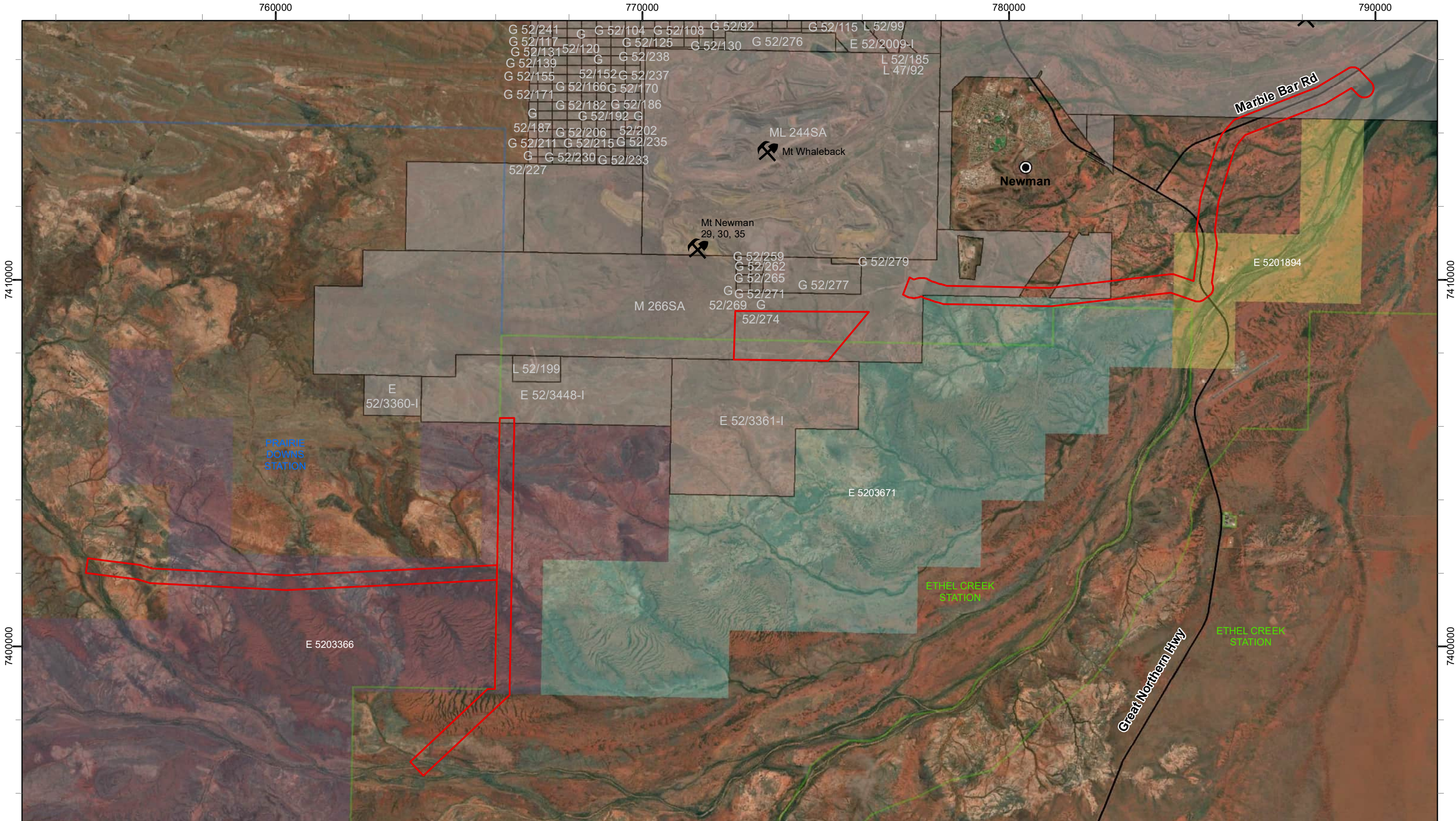
Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994 Created 18/07/2022



**BHP WAIO**  
**Western Ridge Pipeline  
Reconnaissance Flora and  
Vegetation Survey**

**Figure 1.1: Survey Area and  
regional location**





**Legend**

Survey Area

Operating Mine

State Road

Current BHP Tenement

**Tenement Holder**

GATEWAY PROJECTS WA PTY LTD

GREENMOUNT RESOURCES PTY LTD

HAMERSLEY IRON PTY. LIMITED

**Ex-Pastoral Lease**

ETHEL CREEK STATION

PRAIRIE DOWNS STATION

**biologic**  
Environmental Survey

Scale: 1:96,500

024

Km

Coordinate System: GDA 1994 MGA Zone 50

Projection: Transverse Mercator

Datum: GDA 1994      Created 23/05/2022

**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 1.2: Survey Area and**  
**BHP tenure**



## 1.3 Legislation and Compliance

### 1.3.1 Compliance

The survey was carried out in a manner consistent with the Western Australian Environmental Protection Authority (EPA), Department of Biodiversity, Conservation and Attractions (DBCA) and BHP WAIO guidelines for the environmental surveying and reporting of flora and vegetation. The following guidelines, procedures and documents were used prior to, during and after completion of the field survey:

- EPA (2018) Statement of Environmental Principles, Factors and Objectives;
- EPA (2016a) Environmental Factor Guideline: Flora and Vegetation;
- EPA (2016b) Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment;
- BHP WAIO's Biological Survey Spatial Data Requirements (SPR-IEN-EMS-015) (BHP WAIO, 2020); and
- BHP WAIO's Vegetation and Flora Survey Procedure (0124627) (BHP, 2018).

### 1.3.2 Background to Protection of Flora and Vegetation

Within Western Australia, all native flora is protected under the *Biodiversity Conservation Act 2016* (BC Act) and any action that has the potential to impact on native flora needs to be approved by relevant State and/ or Federal departments, as dictated by the Western Australian *Environmental Protection Act 1986* (EP Act) and the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Flora taxa that are determined to be at risk of extinction or in decline are afforded extra protection under these Acts. For the purposes of this report, these are called significant flora taxa. A summary of applicable legislation and status codes is provided in Table 1.1. Additional information on conservation status codes is provided in Appendix A.

The EPBC Act identifies Threatened Ecological Communities (TECs) as ecological communities at risk of extinction. The BC Act provides for the statutory listing of TECs by the Minister. The Western Australian Minister for Environment has endorsed 69 ecological communities as threatened under four categories: critically endangered (20), endangered (17), vulnerable (28) and presumed totally destroyed (four).

For some flora taxa and ecological communities, there is insufficient information to determine their status as threatened. These taxa are generally considered by the EPA/ Department of Biodiversity, Conservation and Attractions (DBCA) as 'significant' for all development related approvals and are listed on a 'Priority List' (Priorities 1, 2 and 3 for poorly known species and Priority 4 for rare and near threatened species). The Priority List is regularly reviewed and maintained by DBCA. Possible TECs that do not meet the criteria for statutory listing by the Minister for Environment are added to DBCA's 'Priority Ecological Communities' (PECs) lists under Priorities 1, 2, 3 (poorly known), 4 (near threatened) or 5 (conservation dependent).

**Table 1.1: Conservation significance assessment guidelines**

Agreement, Act or List	Status Codes
<b>Federal</b>	
<b>EPBC Act</b>  The Department of Climate Change, Energy, the Environment and Water (DCCEEW) (formerly the Department of Agriculture, Water, and the Environment (DAWE)) lists threatened flora, which are determined by the Threatened Species Scientific Committee (TSSC) according to criteria set out in the Act. The Act lists flora that are considered to be of conservation significance under one of the categories listed under 'Status Codes'.  TECs are those that are at risk of extinction.	Species <ul style="list-style-type: none"> <li>Extinct (EX)</li> <li>Extinct in the Wild (EW)</li> <li>Critically Endangered (CR)</li> <li>Endangered (EN)</li> <li>Vulnerable (VU)</li> <li>Conservation Dependent (CD)</li> </ul> TECs <ul style="list-style-type: none"> <li>Critically Endangered (CR)</li> <li>Endangered (EN)</li> <li>Vulnerable (VU)</li> </ul>
<b>State</b>	
<b>BC Act</b>  The BC Act provides for the listing of threatened native flora and TECs that need protection as critically endangered, endangered, or vulnerable species or ecological communities because they are under identifiable threat of extinction (species) or collapse (ecological communities).	Species <ul style="list-style-type: none"> <li>Extinct (EX)</li> <li>Extinct in the Wild (EW)</li> <li>Critically Endangered (CR)</li> <li>Endangered (EN)</li> <li>Vulnerable (VU)</li> </ul> TECs <ul style="list-style-type: none"> <li>Presumed Totally Destroyed (PD)</li> <li>Critically Endangered (CR)</li> <li>Endangered (EN)</li> <li>Vulnerable (VU)</li> </ul>
<b>DBCA Priority List</b>  DBCA produces a list of Priority species and ecological communities that have not been assigned statutory protection under the BC Act. This system gives a ranking from Priority 1 to Priority 5.	<ul style="list-style-type: none"> <li>Priority 1 (Poorly-known species/ ecological communities) (P1)</li> <li>Priority 2 (Poorly-known species/ ecological communities) (P2)</li> <li>Priority 3 (Poorly-known species/ ecological communities) (P3)</li> <li>Priority 4 (Rare, Near Threatened species/ ecological communities, in need of monitoring) (P4)</li> <li>Priority 5 (Conservation dependent ecological communities) (P5)</li> </ul>

### 1.3.3 Introduced Flora

#### Weeds of National Significance

The Commonwealth of Australia, in collaboration with the states and territories, has identified 32 Weeds of National Significance (WoNS) based on an assessment process that prioritises these weeds according to their invasiveness, potential for spread and environmental, social, and economic impacts. A list of 20 WoNS was endorsed in 1999 and a further 12 were added in 2012.

Landowners and land managers at all levels are responsible for managing WoNS. State and territory governments are responsible for legislation, regulation, and administration of weeds. The WoNS were

selected as they require coordination among all levels of government, organisations, and individuals with weed management responsibilities.

### Declared Pests

To protect Western Australian agriculture the Department of Primary Industries and Regional Development (DPIRD) (formerly the Department of Agriculture and Food Western Australia, DAFWA) regulates harmful plants under the *Biosecurity and Agriculture Management Act 2007* (BAM Act) . Plants that are prevented entry into the state or have control or keeping requirements within the state are known as Declared Pests (DPs). The main purposes of the BAM Act and its regulations related to DPs are to prevent new plant pests from entering Western Australia, manage the impact and spread of those pests already present in the state and safely manage the use of agricultural chemicals.

The BAM Act has categorised the weeds of Western Australia into four main classifications:

- DPs (under Section 22 of the Act);
- Permitted (under Section 11 of the Act);
- Prohibited (under Section 12 of the Act); and
- Permitted requiring a permit (Section 73, BAM Regulations 2013).

Under the BAM Act, all DPs listed under Section 22 (not including pests listed under Section 12 of the BAM Act; Prohibited Pests) are placed in one of three control categories:

- C1 (Exclusion) — Pests will be assigned to this category if they are not established in Western Australia and control measures are to be taken, including border checks to prevent them entering and establishing in the State;
- C2 (Eradication) — Pests will be assigned to this category if they are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still feasible; and
- C3 (Management) — Pests will be assigned to this category if they are established in Western Australia, but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.

Prohibited pests listed under Section 12 of the BAM Act are assigned separate control categories:

- Category 1 (C1) – Exclusion: if in the opinion of the Minister introduction of the prohibited organism into the State or a part of the State should be prevented; and
- Category 2 (C2) – Eradication: if in the opinion of the Minister eradication of the prohibited organism from the State or a part of the State is feasible.

### Weed Prioritisation

In 2008, the Department of Parks and Wildlife (now DBCA) developed and implemented an integrated approach to weed management on Parks and Wildlife-managed lands in Western Australia, the Weed

Prioritisation Process (DBCA, 2013). It was updated in 2013 and further revised in 2016. Weeds were prioritised in each region, based on their:

- invasiveness;
- ecological impact;
- potential and current distribution; and
- feasibility of control.

The resulting priorities focus on weeds considered to be high impact, rapidly invasive and still at a population size that can feasibly be eradicated or contained to a manageable size. This means that weed taxa that are already widespread may not be ranked as a high priority. The weed prioritisation for the Pilbara bioregion has recently been revised by the DBCA. The key priorities are now centred on 'Priority Alert' weeds and weeds that receive a rating for 'ecological impact' and 'invasiveness'.



## 2 ENVIRONMENT

### 2.1 Biogeography

The Survey Area is located in the southern section of the Pilbara Craton (Kendrick, 2001) in the Pilbara and Gascoyne bioregions (Figure 1.1), as defined by the Interim Biogeographic Regionalisation of Australia (IBRA) (Thackway & Cresswell, 1995). The Pilbara bioregion is characterised by vast coastal plains and inland mountain ranges with cliffs and deep gorges, with predominantly mulga low woodlands or snappy gum over bunch and hummock grasses (Thackway & Cresswell, 1995).

The Pilbara bioregion is classified into four separate subregions, Chichester (PIL01), Fortescue (PIL02), Hamersley (PIL03) and Roebourne (PIL04), of which the Survey Area is located within the Hamersley subregion (approximately 1,369 ha or 63 %; Figure 1.1). The Hamersley subregion is characterised by mountainous areas of sedimentary ranges and plateaus, dissected by gorges (Kendrick, 2001). The Hamersley contains extensive open snappy gum woodland and hummock grassland communities on ranges and plateaus, with low mulga woodlands over bunch grasses on fine textured soils in lower areas and valley floors (Kendrick, 2001).

The significant and dominant feature of this subregion is the Hamersley Range. This prominent range feature, 450 km long, is a mountainous plateau which receives significantly higher rainfall than the surrounding subregion giving rise to deeply incised gorges, up to 100 metres (m) deep, containing extensive permanent spring-fed streams and pools (Kendrick, 2001). The Hamersley Range (to the south) and Chichester Range (to the north) drain to give rise to the Fortescue Marsh and Fortescue River system (McKenzie *et al.*, 2003).

The Gascoyne bioregion is characterised by Proterozoic sedimentary and granite ranges divided by broad flat valleys. Vegetation is dominated by open mulga woodlands on the shallow earthy loams over hardpan on the plains, with mulga scrub and *Eremophila* shrublands occurring on the shallow stony loams of the ranges (Thackway & Cresswell, 1995).

The Gascoyne bioregion is classified into three separate subregions, Ashburton (GAS01), Carnegie (GAS02), and Augustus (GAS03), of which the Survey Area is located within the Augustus subregion (approximately 800 ha or 37 %; Figure 1.1). This subregion is characterised by rugged low sedimentary and granite ranges divided by broad flat valleys (Desmond *et al.*, 2001). Vegetation is dominated by mulga woodland with *Triodia*, occurring on the shallow stony loams on rises, while the shallow earthy loams over hardpan on the plains are covered by Mulga parkland (Desmond *et al.*, 2001). This subregion contains the headwaters of the Ashburton and Fortescue Rivers (Desmond *et al.*, 2001).

### 2.2 Existing Land Use and Tenure

The Survey Area is comprised of three mining tenements held by BHP Billiton Minerals Pty Ltd and BHP Iron Ore (Jumblebar) Pty Ltd (a subsidiary of the BHP Group), which include one mining lease, one mineral lease and one exploration licence (Figure 1.2). Three other exploration licences occur

across the Survey Area, with these held by Gateway Projects WA Pty Ltd (E 5203366), Greenmount Resources Pty Ltd (E 5203671), and Hamersley Iron Pty Limited (E 5201894).

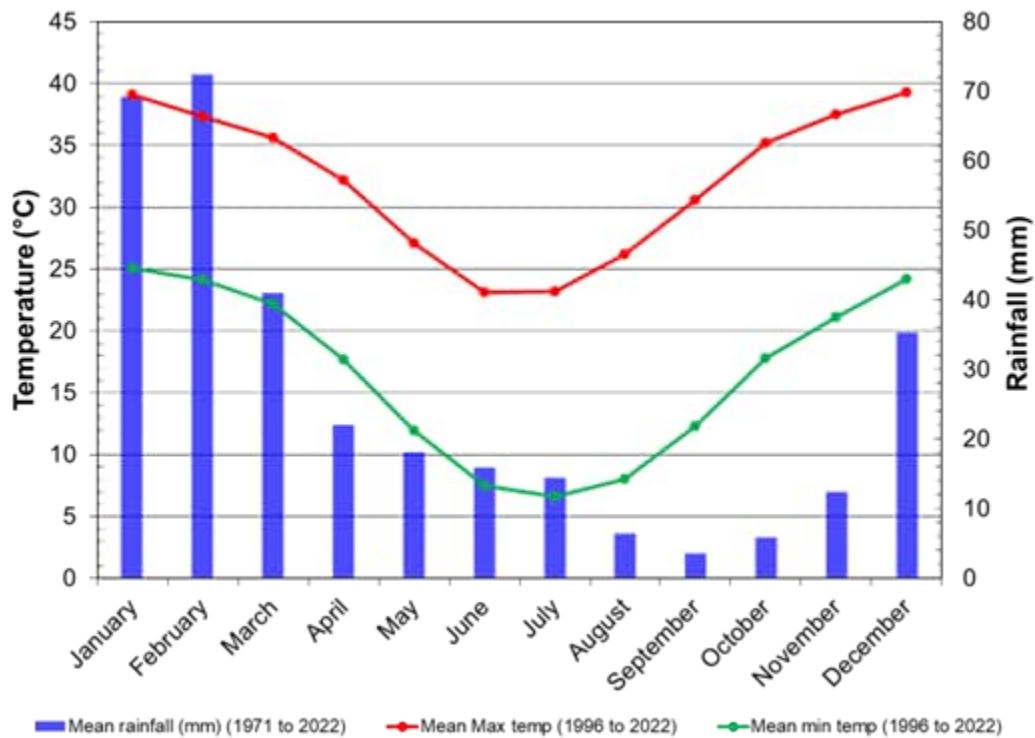
The southwest portion and the lower half of the central portion are located within the Ethel Creek pastoral lease while the western portion is within the Prairie Downs pastoral lease, both of which are actively utilised for the grazing of cattle (Figure 1.2). Pastoral infrastructure, including tracks and fences, exists within the Survey Area, while mining and exploration works occur to the north (Mt Whaleback). The Survey Area is located within the Shire of East Pilbara and the Shire of Meekatharra local government authorities (Figure 1.1).

### 2.3 Climate

The Pilbara bioregion has a semi-desert to tropical climate, with rainfall occurring sporadically throughout the year, although mostly during summer (Thackway & Cresswell, 1995). Summer rainfall is usually the result of tropical storms in the north or tropical cyclones that impact upon the coast and move inland (Leighton, 2004). The winter rainfall is generally lighter and is the result of cold fronts moving north easterly across the state (Leighton, 2004). Meanwhile, the Gascoyne bioregion has a desert/ arid climate with a bimodal rainfall pattern of predominantly winter rainfall in the west, and summer rainfall in the east (Bastin & ACRIS, 2008; Desmond *et al.*, 2001).

The average annual rainfall over the broader Pilbara area ranges from around 200 – 400 millimetres (mm) (predominantly in January, February, and March), although rainfall may vary widely from year to year (van Etten, 2009) with up to 1,200 mm falling in some locations in some years (McKenzie *et al.*, 2009). Annual rainfall on the Chichester and Hamersley Ranges is 400 mm (Tille, 2006).

Long-term climatic data are not available for the Survey Area itself; however, long term climatic data are available from the Bureau of Meteorology (BoM) weather station at Newman Airport (Station 7176), 1.9 km south east of the Survey Area (BoM, 2022). Newman Airport is expected to provide the most accurate long-term average (LTA) dataset for climatic conditions experienced within the Survey Area (Figure 2.1). The average annual rainfall for Newman is 324.4 mm (BoM, 2022). However, there are significant fluctuations between years.



**Figure 2.1: Long-term rainfall and temperature from Newman Airport Station 7176 (BoM, 2022)**

## 2.4 Geology

According to the Australian Geological Provinces database, the Survey Area is located mostly within the Warakurna Large Igneous Province (Geoscience Australia, 2021). This database was compiled Australia-wide with spatial data captured at a wide scale of approximately 1:1 million. The Warakurna Large Igneous Province consists of layered mafic-ultramafic intrusions, mafic to felsic volcanic rocks and dykes, extensive mafic sills and swarms of mafic dykes (Wingate *et al.*, 2004). The Warakurna Large Igneous Province consists of coeval mafic igneous rocks. The bulk of the magmatic products emplaced between 1,078 and 1,070 million years ago, along an east-west swath approximately 800 km wide and 2,400 km long (Wingate *et al.*, 2004).

Portions of the Survey Area are also located within the Fortescue Basin, Hamersley Basin, and the Sylvania Dome Provinces (Geoscience Australia, 2021). The Fortescue Basin overlies the Pilbara Craton and entirely consists of the Fortescue Group, which is predominantly a volcanic succession, characterised by basaltic rocks. The Hamersley Basin then overlies the Fortescue Basin, consisting of banded iron formation, chert, pelite, felsic volcanic rocks, dolostone, and dolomitic mudstone. The Sylvania Dome or Inlier is an Archaean granite-greenstone outcrop with mafic- ultra mafic sills that is located within the Hamersley and Fortescue Basins (Hickman *et al.*, 2010; Tyler, 1991).

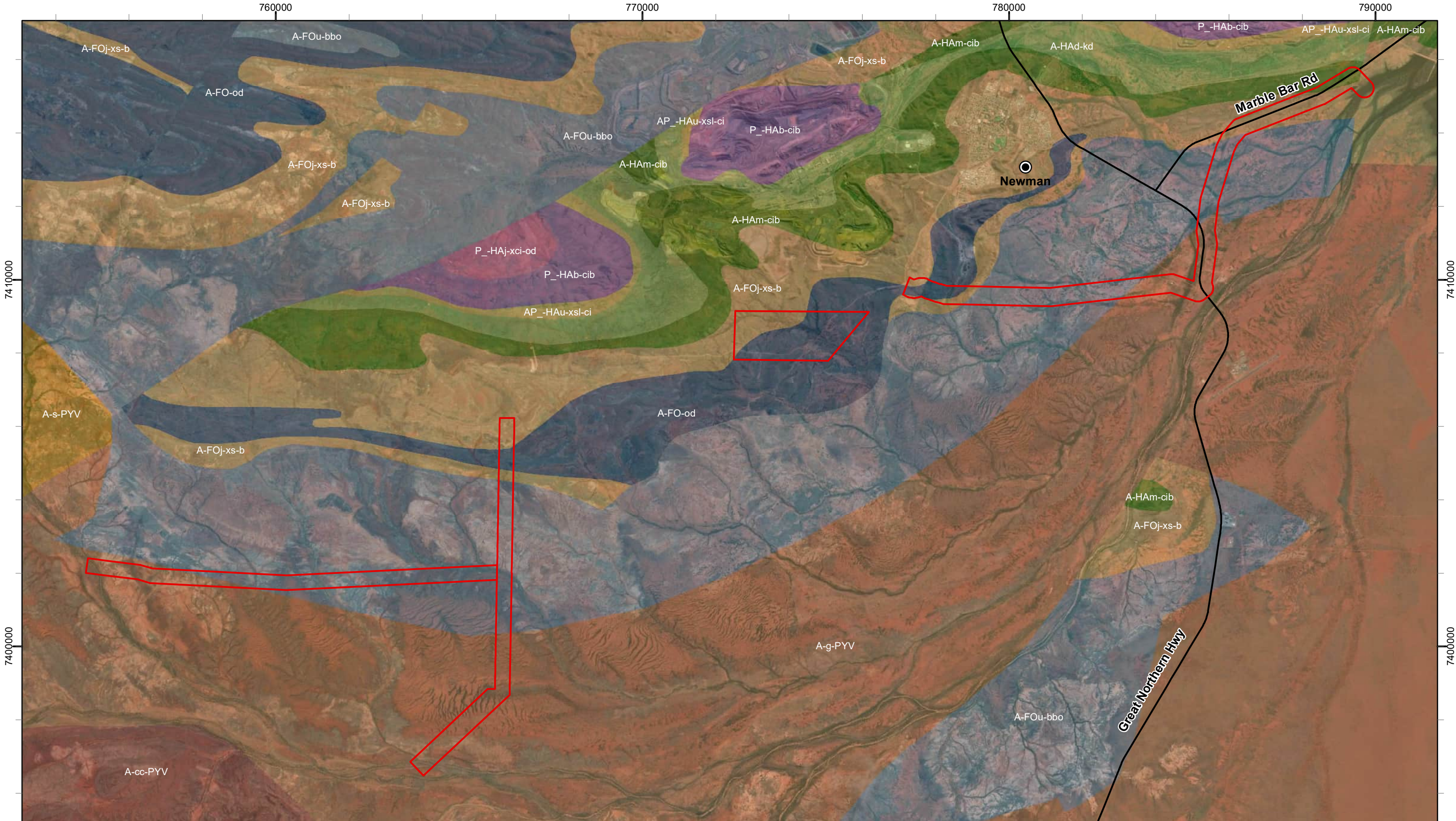
At a finer scale (1:500,00) bedrock geology of the Survey Area (GSWA, 2016) is shown in Figure 2.2. The most dominant unit across the Survey Area is the Bunjinah Formation (A-Fou-bbo) at approximately 810 ha or 37 % (Table 2.1).

**Table 2.1: Bedrock geology units of the Survey Area**

Bedrock Geology Unit	Description	Approximate Extent in the Survey Area	
		ha	%
Bunjinah Formation (A-FOu-bbo)	Pillowed and massive basaltic flows; basaltic breccia and basaltic volcanic sandstone; minor chert; amygdaloidal basalt flows occur in upper parts of formation; metamorphosed	810	37
Sylvania Inlier granitic unit (A-g-PYV)	Granite to granodiorite; metamorphosed and variably foliated	570	27
Fortescue Group (A-FO-od)	Dolerite dyke or sill	376	17
Jeerinah Formation (A-FOj-xs-b)	Siliciclastic sedimentary rocks, mafic volcanic rocks, and minor felsic volcanic rocks; local carbonate rocks, chert, and dolerite sills	375	17
Marra Mamba Iron Formation (A-Ham-cib)	Chert, banded iron-formation, mudstone, and siltstone; minor carbonate; metamorphosed	40	2
<b>Total</b>		<b>2,169</b>	<b>100</b>

NB: values have been rounded to the nearest whole number





**Legend**  

Survey Area

State Road

**Interpreted Bedrock Geology**

A-FO-od; Fortescue Group

A-FOj-xs-b; Jeerinah Formation

A-FOu-bbo; Bunjinah Formation

A-HAd-kd; Wittenoom Formation

A-HAm-cib; Marra Mamba Iron Formation

A-cc-PYV; Sylvania Inlier greenstones

A-g-PYV; Sylvania Inlier granitic unit

A-s-PYV; Sylvania Inlier greenstones

AP-HAu-xsl-ci; Mount McRae Shale and Mount Sylvia Formation

P-HAb-cib; Brockman Iron Formation

P-HAj-xci-od; Weeli Wolli Formation

N

biologic

Environmental Survey

0

2

4

Km

Scale: 1:96,500

Coordinate System: GDA 1994 MGA Zone 50

Projection: Transverse Mercator

Datum: GDA 1994

Created 18/07/2022

An inset map showing the location of the survey area within Western Australia. The map highlights the survey area in red and shows the locations of Karratha, Dampier, Marble Bar, Nullagine, Tom Price, Paraburdoo, and Newman. The map is bounded by coordinates 115°E to 117°E on the x-axis and 28°S to 30°S on the y-axis.

**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 2.& Broad geology**  
**of the Survey Area**



## 2.5 Soils and Landforms

The Atlas of Australian Soils (Northcote *et al.*, 1960-1968) was compiled by Commonwealth Scientific and Industrial Research Organisation in the 1960s to provide a consistent national description of Australia's soils. It comprises of a series of 10 maps and associated explanatory notes and is published at a scale of 1:2,000,000, but the original compilation was at scales from 1:250,000 to 1:500,000.

The broad soil landscape units that have been mapped across the Survey Area comprise Oc64, Fa13, and BE6 (Northcote *et al.*, 1960-1968) (Table 2.2 and Figure 2.3). The majority of the Survey Area is mapped as Oc64 occurring across all four portions. A small corner of the central portion is mapped as Fa13, and soil unit BE6 runs through most of the southwest portion and half of the western and northeast portions.

**Table 2.2: Soil landscape units mapped within the Survey Area**

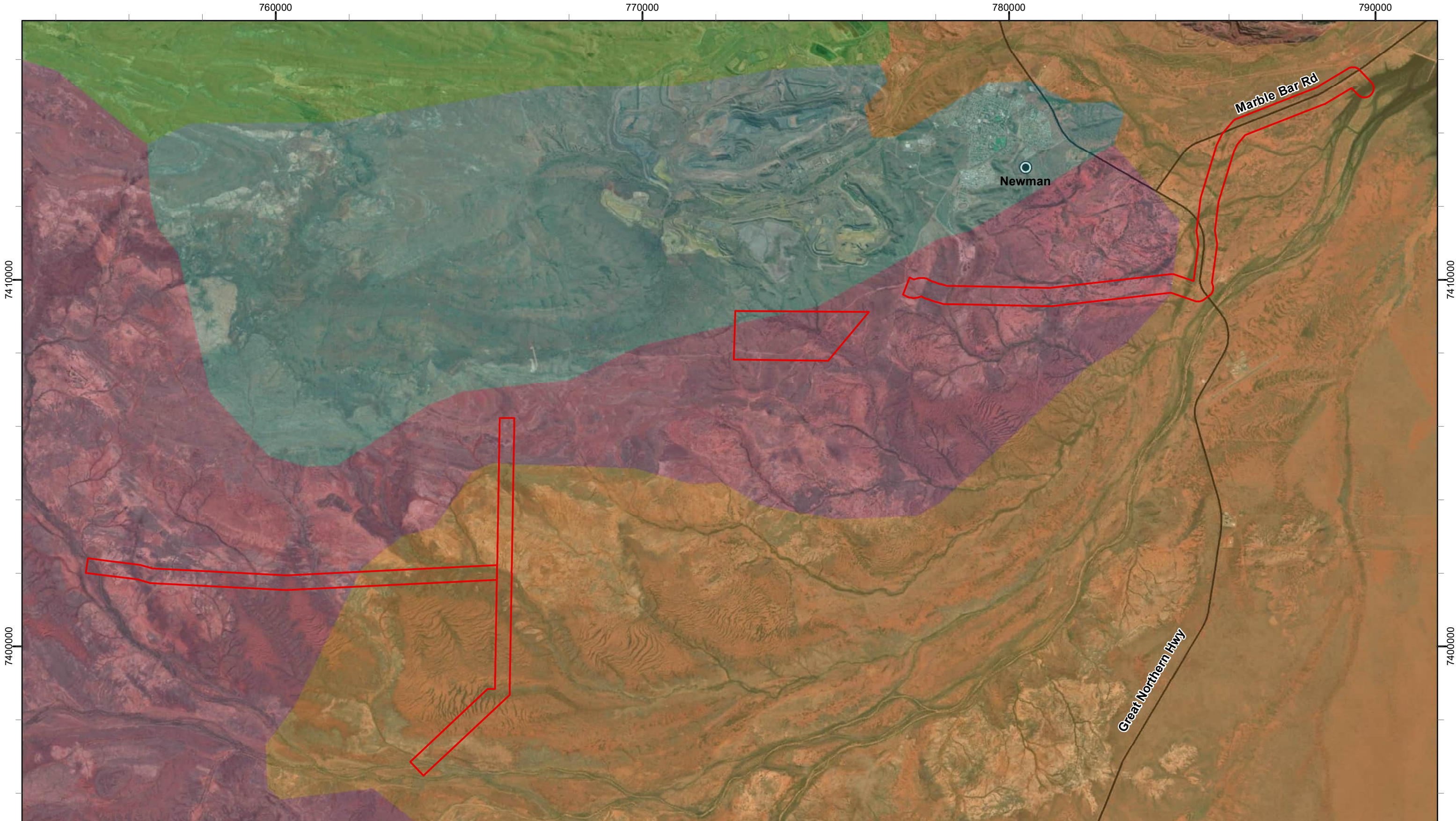
Soil Unit	Description	Approximate Extent in the Survey Area	
		ha	%
Oc64	Low stony hills and dissected pediments on granite with occasional basic dykes: chief soils are hard. Soils with predominantly physical limitations; hard-setting soils with dispersible clay subsoils.	1,097	51
BE6	Extensive flat and gently sloping plains that sometimes have a surface cover of gravels and on which red-brown hardpan frequently outcrops: chief soils are shallow earthy loams	1,044	48
Fa13	Ranges of banded jaspilite and chert along with shales, dolomites, and iron ore formations; some areas of ferruginous duricrust as well as occasional narrow winding valley plains and steeply dissected pediments. This unit is largely associated with the Hamersley and Ophthalmia Ranges. The soils are frequently stony and shallow and there are extensive areas without soil cover: chief soils are shallow stony earthy loams along with some soils on the steeper slopes.	28	1
<b>Total</b>		<b>2,169</b>	<b>100</b>

NB: values have been rounded to the nearest whole number

At a finer scale, the Survey Area consists of soils varying from shallow to deep red brown loams, stony soils, deep sands, to cracking and non-cracking clays. Stony soils predominately occur on hills and ridges with some areas of calcareous shallow loams. Deep red brown sands are located on sandy levees and sand sheets compared to more shallow red sands on some stony plains. Undulating plains have non-cracking clays, whilst the flatter plains and drainage floors have cracking clays. Red shallow loam is common across the Survey Area from the hills and ridges to footslopes and plains with areas of deeper loamy soil on gilgai plains (van Vreeswyk *et al.*, 2004).

The Survey Area occurs within the Hamersley Plateaus Zone. The dominant broad landforms in the Survey Area are low stony hills, ranges with dykes and dissections, and extensive flat and gently sloping plains (Northcote *et al.*, 1960-1968).





**Legend**

Survey Area

State Road

**Soil Unit**

Fa14

BE6

Fa13

Oc64

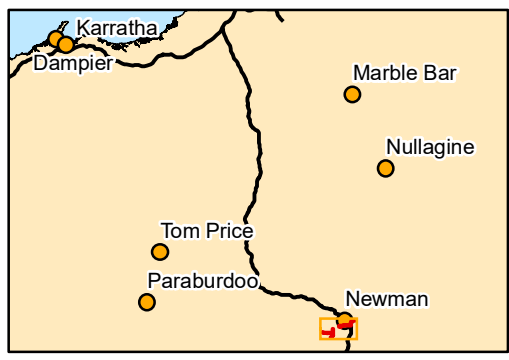
N

biologic  
Environmental Survey

Scale: 1:96,500

0 2 4 Km

Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994      Created 18/07/2022



**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 2.' : Soils**  
**of the Survey Area**



## 2.6 Land Systems

Work undertaken by a joint team from the Department of Primary Industries and Regional Development (DPIRD) (formerly Department of Agriculture) and the Department of Planning, Lands and Heritage (formerly Department of Lands Administration) classified the pastoral areas of Western Australia (Payne *et al.*, 1988; van Vreeswyk *et al.*, 2004). The purpose of the surveys were to provide a comprehensive description and mapping of the biophysical resources of the pastoral areas, together with an evaluation of the pastoral potential and the condition of the soils and vegetation (Payne *et al.*, 1988; van Vreeswyk *et al.*, 2004).

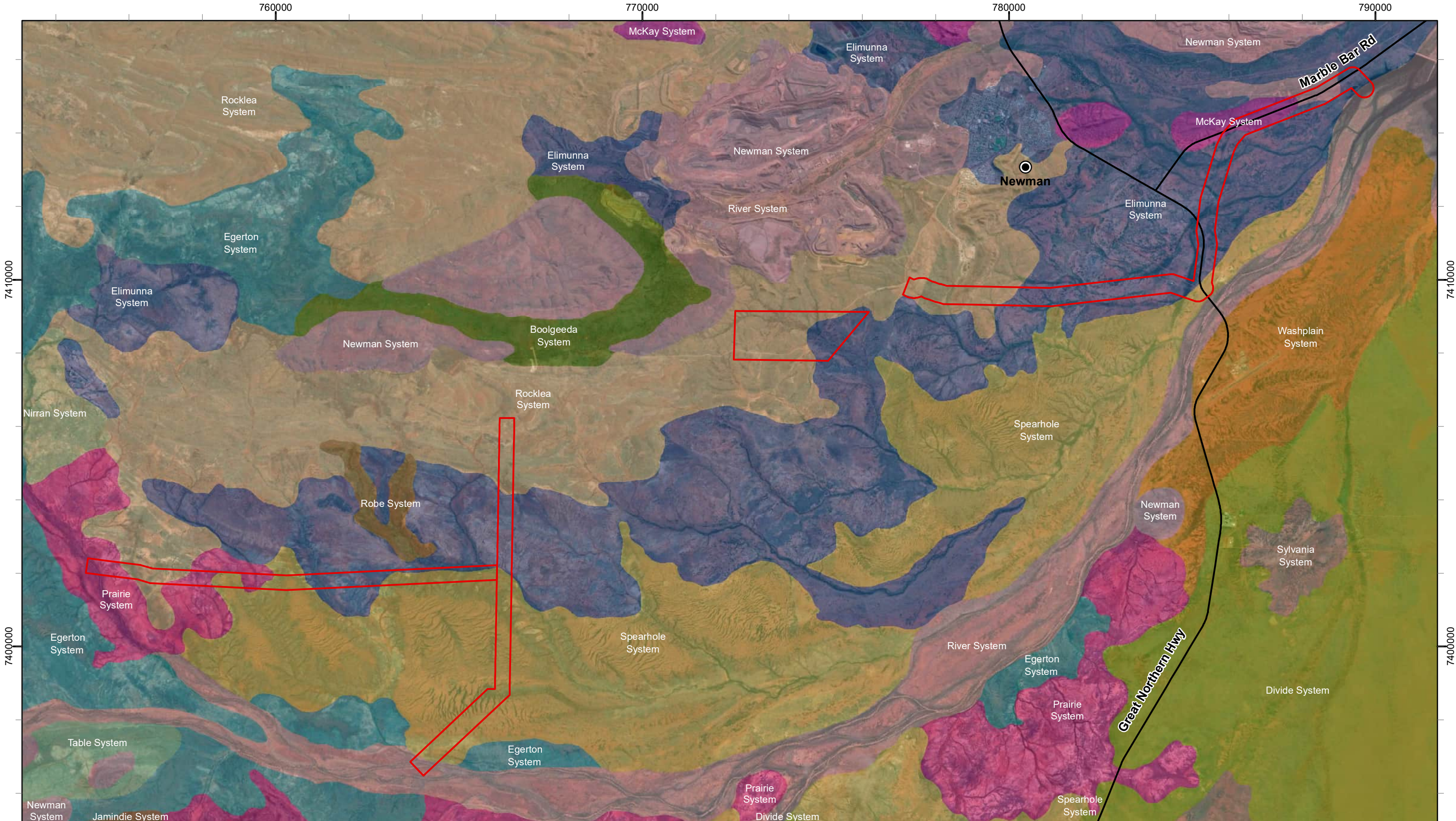
Seven land systems have been mapped as occurring across the Survey Area; Elimunna, McKay, Newman, Prairie, River, Rocklea, Spearhole (Payne *et al.*, 1988; van Vreeswyk *et al.*, 2004) (Table 2.3 and Figure 2.4). The dominant land system is the Elimunna land system, which covered approximately 38 % of the Survey Area (Table 2.3). The Elimunna land system is described as 'stony plains on basalt supporting sparse *Acacia* and *Senna* shrublands and patchy tussock grasslands' (Table 2.3).

**Table 2.3: Land Systems of the Survey Area**

Land System	Land Type	Description	Approximate Extent in Survey Area	
			Ha	%
Elimunna	Stony plains with <i>Acacia</i> shrublands	Stony plains on basalt supporting sparse <i>Acacia</i> and <i>Senna</i> shrublands and patchy tussock grasslands.	834	38
Rocklea	Hills and ranges with spinifex grasslands	Basalt hills, plateaux, lower slopes, and minor stony plains supporting hard spinifex (and occasionally soft spinifex) grasslands.	579	27
Spearhole	Wash plains on hardpan with mulga shrublands	Gently undulating gravelly hardpan plains and dissected slopes supporting groved mulga shrublands and hard spinifex.	484	22
Prairie	Stony plains and low hills with acacia shrubland	Gently undulating stony plains and granite hills supporting <i>Acacia-Eremophila-Senna</i> shrublands and minor soft spinifex grasslands.	106	5
McKay	Hills and ranges with spinifex grasslands	Hills, ridges, plateaux remnants and breakaways of meta sedimentary and sedimentary rocks supporting hard spinifex grasslands.	84	4
Newman	Hills and ranges with spinifex grasslands	Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands.	48	2
River	River plains with grassy woodlands and tussock grasslands	Active flood plains, major rivers and banks supporting grassy <i>Eucalypt</i> woodlands, tussock grasslands and soft spinifex grasslands.	34	2
<b>Total</b>			<b>2,169</b>	<b>100</b>

NB: hectare values have been rounded to the nearest whole number.





**Legend**  

Survey Area

State Road

**Land System**

Boolgeeda System

Divide System

Jamindie System

McKay System

Newman System

Nirran System

Prairie System

River System

Robe System

Rocklea System

Spearhole System

Sylvania System

Table System

Washplain System

N

biologic

Environmental Survey

Scale: 1:96,500

0

2

4

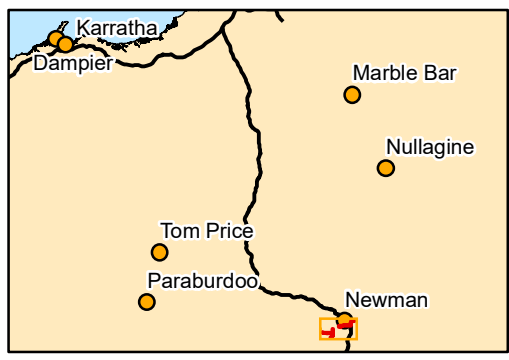
Km

Coordinate System: GDA 1994 MGA Zone 50

Projection: Transverse Mercator

Datum: GDA 1994

Created 23/05/2022



**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 2.4: Land systems**  
**of the Survey Area**



## 2.7 Hydrology and Hydrogeology

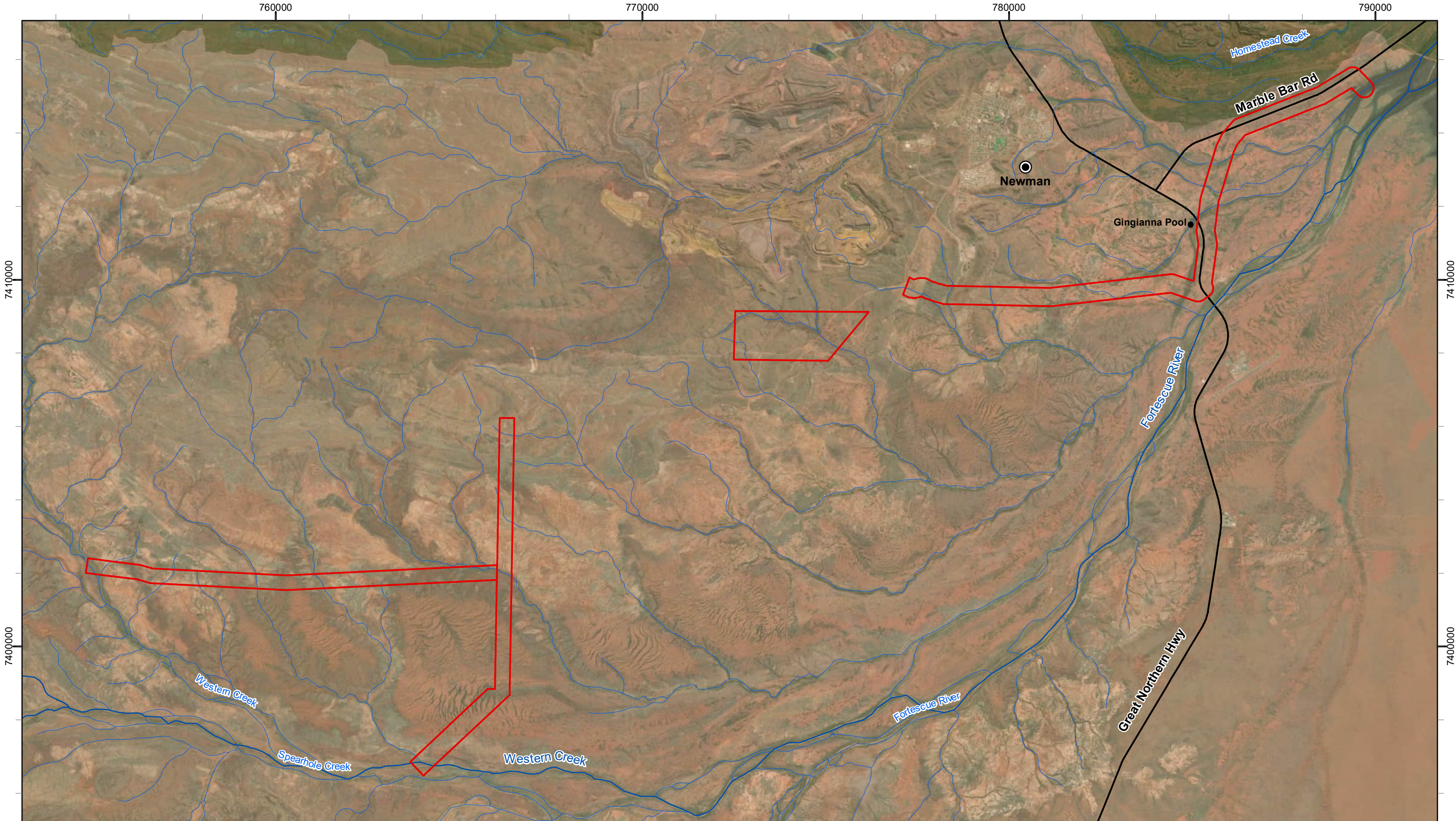
The surface and groundwater hydrology of the Pilbara is highly variable as a result of a dynamic climate with severe droughts and major flooding (DoW, 2010). Streamflow's are usually a direct response to rainfall and are therefore highly seasonal and variable. Most runoff occurs from January to March as a result of episodic cyclonic activities (DoW, 2010).

The Survey Area is located within the Fortescue River basin, which extends from the Upper Fortescue River, along the Fortescue Marsh, and through the Lower Fortescue River. At a finer scale, the Survey Area is located in the Ophthalmia Dam sub-catchment within the Upper Fortescue River Catchment and is directly adjacent to the Fortescue Marsh sub-catchment along Marble Bar road (Figure 2.5). Drainage lines and water bodies occurring within the Survey Area include the Fortescue River, Western Creek, Gingianna Pool, and several minor drainage lines and tributaries (Figure 2.5). Surface water hydrology within the Survey Area is regulated by minor drainage lines that flow from the west or south-west to the north and north-east (Figure 2.5). These minor drainage lines end up discharging into the Fortescue River.

The Fortescue River is a major drainage line that crosses a small section of the Survey Area in the northeast. It is an ephemeral river system that flows during rainfall events associated with cyclonic activity or large summer storms. However, the Survey Area intersects the Fortescue River near the Ophthalmia Dam, where surface water is apparent most of the year (Figure 2.5). Gingianna Pool is another ephemeral drainage system that intersects a small section of the Survey Area, and likely overflows into the Fortescue River following significant rainfall events. Western Creek is a medium and, at times, major ephemeral drainage line that runs southeasterly and connects with the Fortescue River to the east of the Survey Area. Western Creek passes through the western edge of the western portion and the southernmost tip of eastern portion of the Survey Area (Figure 2.5).

Groundwater originates from direct infiltration by rainfall and from surface water flows. Groundwater occurs throughout the Pilbara but is most easily located and accessed near surface water drainage lines (alluvial channels). The most significant aquifers can be grouped into three types: alluvial aquifers that are either unconsolidated sedimentary aquifers or chemically deposited aquifers, consolidated sedimentary (or sedimentary rock) aquifers and fractured rock aquifers. Broadly, the groundwater associated with the Survey Area is located within fractured and weathered rock aquifers. Groundwater is stored in fractures and voids in the rocks and therefore tends to be localised. Groundwater recharge is also episodic and affected by direct infiltration of rainfall over areas where the rocks are fractured.



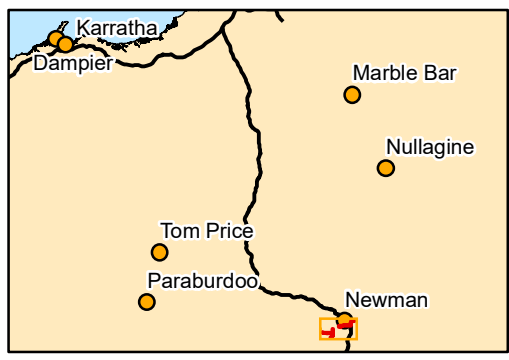


- Legend**
- |             |                          |                                           |
|-------------|--------------------------|-------------------------------------------|
| Survey Area | <b>Surface Hydrology</b> | <b>Fortescue River Upper Subcatchment</b> |
| State Road  | Minor                    | Ophthalmia Dam                            |
|             | Major                    | Unnamed                                   |

Scale: 1:96,500

0 2 4 Km

Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994 Created 23/05/2022



**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 2.5: Hydrology**  
**of the Survey Area**



### 2.7.1 Groundwater Dependent Ecosystems

Groundwater Dependent Ecosystems (GDEs) are ecosystems that rely upon groundwater for their continued existence (BoM, 2021). GDEs can be represented by many different assemblages of biota which rely on groundwater, and as a result come in many forms. For terrestrial ecosystems there are three key types of GDE (BoM, 2021):

1. Aquatic ecosystems: that rely on the surface expression of groundwater – this includes surface water ecosystems which may have a groundwater component, such as rivers, wetlands, and springs;
2. Terrestrial ecosystems: that rely on the subsurface presence of groundwater – this includes all vegetation ecosystems or Groundwater Dependent Vegetation; and
3. Subterranean ecosystems: this includes cave and aquifer ecosystems.

Aboveground terrestrial GDEs are typically characterised by the presence of flora species that rely on groundwater (i.e., phreatophytes). Phreatophytes may be classified as either obligate or facultative phreatophytes depending on their reliance on groundwater (Eamus *et al.*, 2016):

- Obligate phreatophytes are flora species confined to habitats with access to groundwater.
- Facultative phreatophytes are flora species that can utilise groundwater to satisfy a proportion of their ecological water requirement (EWR) when it is available. However, some individuals may also satisfy their EWR by relying solely on uptake from upper unsaturated soils layers where groundwater is inaccessible.

The BoM has developed the Groundwater Dependent Ecosystems Atlas (GDE Atlas) as a national dataset of Australian GDEs to inform groundwater planning and management (BoM, 2021). It is the first and only national inventory of GDEs in Australia.

The GDE Atlas contains information about three key types of ecosystems: Aquatic ecosystems, Terrestrial ecosystems, and Subterranean ecosystems. Importantly, the GDE Atlas also includes the national inflow-dependent landscapes layer which is derived from remotely sensed data. This layer indicates the likelihood that a landscape is accessing water in addition to rainfall (such as soil moisture, surface water or groundwater), and generally represents a potential GDE dataset for all areas not yet studied or investigated in any detail.

The GDE mapping in the GDE Atlas comes from two broad sources:

- National assessment – national-scale analysis based on a set of rules that describe potential for groundwater/ ecosystem interaction and available GIS data.
- Regional studies – more detailed analysis undertaken by various state and regional agencies using a range of different approaches including field work, analysis of satellite imagery and application of rules/conceptual models.

The BoM GDE Atlas indicates that the Survey Area has the potential to support both terrestrial and aquatic GDEs (Appendix B). The majority of the Survey Area has a low GDE potential (national assessment), although the parts that cross the Fortescue River and Western Creek at the south have a moderate potential for GDEs. Western Creek at the southern tip of the Survey Area also has a



moderate potential to support aquatic GDEs, with the remainder of the Survey Area not likely to support aquatic GDEs. BoM (2021) defines Inflow Dependent Ecosystems (IDEs) as vegetation that is either groundwater dependent or is likely to be reliant on subsurface water in addition to rainfall, i.e., from soil water, surface water or irrigation. The likelihood of a landscape using additional water is rated from 1 to 10, with ratings above six indicating that a landscape is likely to be inflow dependent (BoM, 2021). Approximately 33.1 % (718.7 ha) of the Survey Area has a terrestrial IDE rating of 6 or higher likely, overlapping with most of the central portion and small areas of the northeast, southwest and western portions, whereas aquatic IDEs only cross the Survey Area at the bottom of the southwest portion that overlaps with Western Creek, with an IDE rating of 10 (1.8 ha, 0.1 %) (Appendix B).

## 2.7.2 Sheet-flow Dependent Ecosystems

Mulga is a large, variable and taxonomically complex group of plants allied to *Acacia aneura* that dominate significant areas of the vast Australian arid zone (Maslin *et al.*, 2012). The term Mulga is also used to describe vegetation communities in which these taxa predominate (Maslin *et al.*, 2012). A recent revision of the Mulga group (*Acacia aneura* and its close relatives) classified 12 separate entities, excluding informal variants, putative hybrids and intergrades (Maslin & Reid, 2012). The structure and patterning of mulga communities varies from strongly banded (groved) through to open shrublands and woodlands across the landscape (Page & Grierson, 2012). The bandings act as a sink for nutrients and water to infiltrate the soil and are readily available for uptake by the flora located within the banding. This banding and overland sheet-flow supports a diverse biota within the Mulga bands and plays an important ecological function which is well documented (Dawson & Ahern, 1973; Saco *et al.*, 2007; Winkworth, 1973).

Of the six land systems occurring in the Survey Area, the Elimunna, and Spearhole land systems, which support hardpan plains that are relatively level, can be subject to sheet-flow (van Vreeswyk *et al.*, 2004). The Elimunna land system occurs in the northeast and central areas, while the Spearhole land system in the southwest of the Survey Area. Preliminary review of aerial imagery identified that there are obvious signs of mulga banding in the southwest of the Survey Area, which may indicate ecosystems dependent on sheet-flow.

## 2.8 Flora and Vegetation Background

### 2.8.1 Pre-European Vegetation

The Survey Area is located in the Fortescue Botanical District, which is a part of the Eremaean Province (Beard, 1990). The Fortescue Botanical District is essentially a tree- and shrub-steppe with *Eucalyptus* trees, *Acacia* shrubs, *Triodia pungens* and *Triodia wiseana* (Beard, 1990). Some mulga (*Acacia aneura* and close relatives) occurs in valleys and there are short-grass plains on alluvia (Beard, 1990). The vegetation associations of the Survey Area were mapped by Beard (1975), in which he classified the following three vegetation associations (Figure 2.6):

- 18: Low woodland; mulga (*Acacia aneura* and close relatives) (with spinifex) low woodland on the Hamersley Plateau;

- 29: Low woodland, open low woodland, or sparse woodland; Mulga *Acacia aneura* and associated species; and
- 82: Hummock grasslands, low tree steppe; snappy gum (*Eucalyptus leucophloia*) over *Triodia wiseana* on ranges and summits.

The majority of the Survey Area was mapped as vegetation association 18, with vegetation association running through the southern and northeastern portions, and vegetation association 82 running through the middle of the Survey Area (Figure 2.6).

Shepherd *et al.* (2002) reinterpreted and updated the vegetation association mapping to reflect the National Vegetation Information System (NVIS Technical Working Group) standards (ESCAVI, 2003). The update also accounts for extensive clearing since Beard (1975) mapping. Shepherd *et al.* (2002) created a series of 'systems' to assist in removing mosaic vegetation associations originally mapped by Beard (1975); however, some mosaics still occur. The Survey Area is located within the Hamersley, and Kumarina Hills Systems, and under Shepherd *et al.* (2002) comprises:

- Hamersley 18.11: *Acacia* open shrubland / *Ptilotus* mixed open forbland;
- Hamersley 82.3: *Eucalyptus* sparse mallee shrubland / *Senna* mixed sparse shrubland / *Triodia* open hummock grassland and;
- Kumarina 29.0: *Acacia* isolated clumps of shrubs.

The current extent of each of the vegetation system associations remaining exceeds 98 % across the four regional scales: State, bioregion (Pilbara, Gascoyne), subregion (Hamersley, Augustus) and Local Government Authority (Shire of East Pilbara and Shire of Meekatharra) (Government of Western Australia, 2019) (Table 2.4 and Table 2.5). Currently only two of the vegetation system associations (18.11 and 82.3) are represented within the National Reserve System having greater than 19 % and 12 % of their current bioregional and subregional extent within reserves, respectively (Government of Western Australia, 2019) (Table 2.4). However, vegetation system association 29.0, of the Kumarina Hills system association (Table 2.5), is not represented within the National Reserve System (Government of Western Australia, 2019).





- Legend**
- Survey Area
  - State Road
- Pre-European Vegetation**
- |                                                                                                                                                             |                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #ADD8E6; border: 1px solid black; margin-right: 5px;"></span> HAMERSLEY_18 | <span style="display: inline-block; width: 15px; height: 15px; background-color: #FFDAB9; border: 1px solid black; margin-right: 5px;"></span> KUMARINA HILLS_18  |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #FFDAB9; border: 1px solid black; margin-right: 5px;"></span> HAMERSLEY_82 | <span style="display: inline-block; width: 15px; height: 15px; background-color: #90EE90; border: 1px solid black; margin-right: 5px;"></span> KUMARINA HILLS_216 |
|                                                                                                                                                             | <span style="display: inline-block; width: 15px; height: 15px; background-color: #ADD8E6; border: 1px solid black; margin-right: 5px;"></span> KUMARINA HILLS_29  |

N

0

2

4

Km

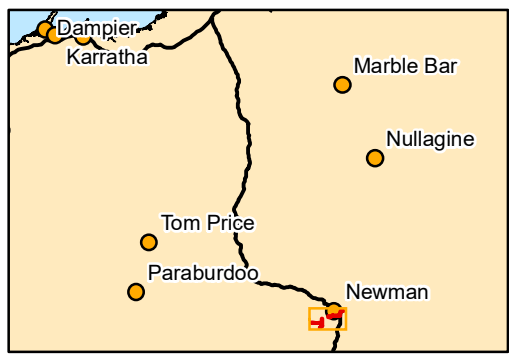
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Coordinate System: GDA 1994 MGA Zone 50

Projection: Transverse Mercator

Datum: GDA 1994

Created 19/07/2022



**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 2.6: Vegetation**  
**associations of the**  
**Survey Area**



**Table 2.4: Regional and local extent of the Hamersley System Associations within the Survey Area**

Code	Survey Area (ha / %)	Scale	Pre-European Extent (ha)	Current Extent Remaining (ha / %)	Current Extent Remaining within Reserves <sup>1</sup> (ha / %)
18.11	666.67	State	580,556	575,851 / 99.19	113,404 / 19.69
		Pilbara	580,512	575,808 / 99.19	113,404 / 19.69
		Hamersley	580,512	575,808 / 99.19	113,404 / 19.69
		Shire of East Pilbara	224,292	220,375 / 98.25	44.41 / 0.02
		Shire of Meekatharra	25,265	25,265 / 100	n/a
82.3	331.24	State	2,169,997	2,157,841 / 99.44	262,983 / 12.19
		Pilbara	2,168,702	2,156,547 / 99.44	262,983 / 12.19
		Hamersley	2,158,862	2,146,708 / 99.44	262,244 / 12.22
		Shire of East Pilbara	573,313	565,215 / 98.59	n/a
		Shire of Meekatharra	78,311	78,016 / 99.62	n/a

<sup>1</sup> Reserves – International Union of Nature Conservation (IUCN, 2019) Class I-IV reserves (i.e. National Parks, Strict Nature Reserves)

Source: Government of Western Australia (2019); NB: area values have been rounded to the nearest whole number.

**Table 2.5: Regional and local extent of the Kumarina Hills System Association within the Survey Area**

Code	Survey Area (ha / %)	Scale	Pre-European Extent (ha)	Current Extent Remaining (ha / %)	Current Extent Remaining within Reserves <sup>1</sup> (ha / %)
29.0	722.52	State	784,575	784,364 / 99.97	n/a
		Gascoyne	780,622	780,429 / 99.98	n/a
		Augustus	780,337	780,144 / 99.98	n/a
		Shire of East Pilbara	42,853	42,645 / 99.51	n/a
		Shire of Meekatharra	732,193	732,191 / 100.00	n/a

<sup>1</sup> Reserves – IUCN Class I-IV reserves (i.e. National Parks, Strict Nature Reserves)

Source: Government of Western Australia (2019); NB: area values have been rounded to the nearest whole number.

## 2.8.2 Bioregional Significance

Under the Convention of Biological Diversity, Australia has worked towards a target of 17 % of the continent to be protected as part of the National Reserve System (NRS) (NRSTG, 2009). In building the NRS, priority is given to under-represented bioregions that have less than 10 % of their remaining area protected in reserves (NRSTG, 2009). Both the Pilbara and Gascoyne bioregions are under-represented bioregions, with both having less than 10 % of its total area protected in reserves. The Hamersley subregion is adequately represented, with more than 12 % of the subregional area protected in reserves, while the Augustus subregion is under-represented, with less than 5 % of the subregional area protected in reserves.

Despite the Pilbara and Gascoyne bioregions being underrepresented within the NRS, greater than 99 % of the bioregional and the Hamersley and Augustus subregional area remains intact (Government of Western Australia, 2019). As such, it has been determined that any potential vegetation clearing within the Survey Area would not substantially impact the biological values of these bioregions (and subregions) as the region will remain intact, and therefore the State retains the

ability to adequately reserve vegetation within the Pilbara and Gascoyne bioregions (and the Hamersley and Augustus subregions).

### 3 METHODOLOGY

#### 3.1 Desktop Assessment

##### 3.1.1 Database Searches

Database searches were undertaken to generate a list of vascular flora taxa previously recorded within, and near, the Survey Area, including introduced and significant taxa. The database searches also identified ecological communities/ vegetation types of significance that occur, or may occur, within and near the Survey Area. Conservation codes for flora and vegetation of significance are provided in Appendix A. Six database searches were conducted around a central coordinate (23°27'5.04"S; 119°41'35.16"E), with varying buffers as deemed appropriate (Table 3.1).

**Table 3.1: Database searches conducted for the Survey Area**

Purpose	Database	Search Radius
To identify flora species and communities previously recorded within the Survey Area and its vicinity, in particular those of significance	DBCA's Threatened & Priority Flora; and Threatened and Priority Ecological Communities databases (DBCA, 2021b, 2021c)	40 km
	DBCA's NatureMap (DBCA, 2021a)	40 km
	Atlas of Living Australia (ALA) (ALA, 2021)	40 km
To identify potential species listed under the Federal EPBC Act within the Survey Area	DCCEEW (formerly DAWE) Protected Matters Search Tool (DAWE, 2021)	40 km
To identify DPs within the Survey Area	Declared Pests Database – Western Australian Organism List (WAOL) (DPIRD, 2021)	Shire of East Pilbara

##### 3.1.2 Literature Review

Background information on the Survey Area and surrounds was compiled prior to, during and after the field survey, to determine likely species assemblages and potential significant taxa. Historic vegetation mapping conducted by Beard (1975) and Shepherd *et al.* (2002), land systems mapping (van Vreeswyk *et al.*, 2004), and the IBRA classification system (Desmond *et al.*, 2001) were consulted to provide broad contextual knowledge of the vegetation types likely to be encountered within the Survey Area. The literature review also considered 37 previous field and desktop surveys of relevance to the Survey Area (Table 3.2). The previous surveys and assessments that were considered were provided by BHP WAIO and the Index of Biological Surveys for Assessments (IBSA). All are located within a radius of 10 km from the Survey Area.

**Table 3.2: Literature sources used for the review**

Survey Title	Reference	Distance from Survey Area (km)
<b>Detailed Flora and Vegetation Surveys</b>		
Baseline Biological & Soil Surveys and Mapping for ML244SA West of the Fortescue River	Biota (2001)	Partially overlaps Survey Area
Orebody 35 and Surrounds Flora and Vegetation Survey	GHD (2011b)	Partially overlaps Survey Area
Western Ridge Biological Survey	Onshore (2014b)	Partially overlaps Survey Area
Coombanbunna Well Detailed Flora and Vegetation Survey	Biologic (2020a)	Partially overlaps Survey Area
Mt Whaleback OB30 and OB35 Soil and Biological Survey	HGM (1999b)	Adjacent north
Western Ridge Exploration Project Biological Survey	ecologia (2005)	Adjacent west
Western Ridge Exploration Project Biological Survey	ecologia (2006a)	Adjacent north & west
Mount Whaleback Flora & Vegetation Assessment – Phase III	ENV (2006a)	Adjacent north
Newman Power Network Flora and Fauna Survey	Biologic (2009)	Adjacent north
Whaleback Flora & Vegetation Survey and Fauna Assessment	Onshore and Biologic (2009)	Adjacent north
Whaleback TSF Flora, Vegetation and Fauna Assessment	Astron (2010)	Adjacent north
Orebody 35 Vegetation Clearing Permit Area Flora and Fauna Assessment	ENV (2010)	Adjacent west
Mt Whaleback East Flora, Vegetation and Fauna Assessment	ENV (2011a)	Adjacent north
Eastern Ridge (OB23/24/25) Flora and Vegetation Assessment	ENV (2012)	Adjacent north
Western Ridge Detailed Flora and Vegetation Survey	Biologic (2020b)	Adjacent south
RGP4 Newman Hub Infrastructure Area Flora and Vegetation Assessment	ENV (2006c)	1 km north
RRG4 Newman Hub Topsoil Stockpile and Borrow Areas for Construction Flora and Vegetation Assessment	ENV (2006d)	1.5 km northwest
Whaleback Power Station Flora and Vegetation Assessment	ENV (2009c)	4.4 km north
Myopic Project Area, Newman Flora, and Fauna Assessment	GHD (2008b)	5.2 km northwest
Proposed Kurra Village Extension Area Flora and Vegetation Assessment	ENV (2006b)	5.5 km north
Newman to Yandi Transmission Line Flora and Vegetation Assessment	ENV (2009b)	5.5 km north

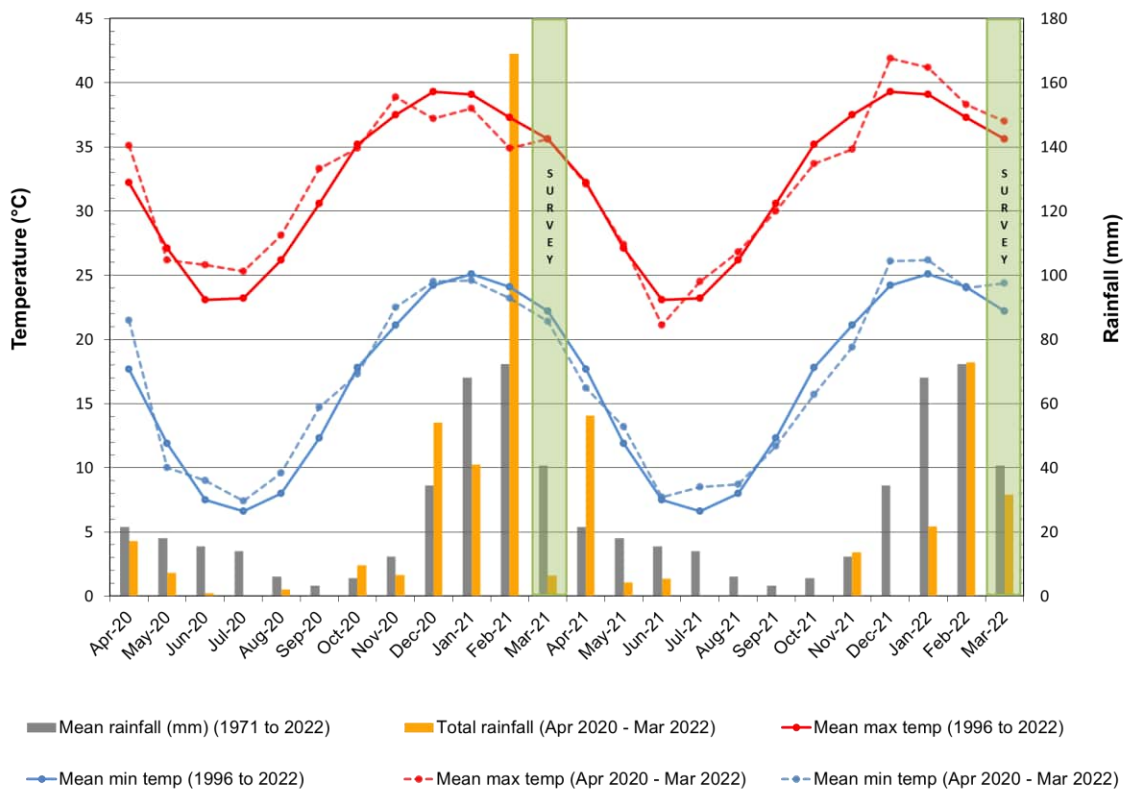


Survey Title	Reference	Distance from Survey Area (km)
<b>Reconnaissance flora and vegetation surveys</b>		
Level 1 flora and fauna surveys along the Great Northern Highway for Jimblebar mine module transport	Eco Logical (2012)	1.3 km west
Homestead Creek Culvert Flora and Vegetation Assessment	ENV (2009a)	1.5 km northeast
Newman Power Line Corridor Level 1 Flora and Fauna Survey	Eco Logical (2011)	1.9 km north
Coolibah Village Level 1 Flora and Vegetation Survey and Level 1 Fauna Assessment	Astron (2014)	4.3 km southeast
Kurra Village Targeted Flora, Vegetation and Fauna Survey	Onshore (2015)	5.1 km north
<b>Targeted flora surveys</b>		
Newman Hub: Priority Flora and Weed Survey	ecologia (2004)	Adjacent north
Regional Search for <i>Lepidium catapycnon</i> in the Greater Newman Area (Pilbara), Western Australia	ENV (1999b)	2.8 km north
Field Search and Observations of <i>Lepidium catapycnon</i> Populations, Mt. Whaleback, Newman	ENV (1999a)	5 km north
Newman Ammonium Nitrate Storage Facility Conservation Significant Flora Survey	ecologia (2006b)	6.3 km north
Newman Ammonium Nitrate Storage Facility - Phase 2 Conservation Significant Flora Survey	ecologia (2006c)	6.3 km north
Mt. Whaleback <i>Lepidium catapycnon</i> Survey	HGM (1997)	8 km northwest
Follow-up Survey of Mt. Whale back <i>Lepidium catapycnon</i> Population	HGM (1999a)	8 km northwest
<b>Desktop assessments / reviews</b>		
Consolidation of Regional Vegetation Mapping BHP Billiton Iron Ore Pilbara Tenure	Onshore (2014a)	Partially overlaps Survey Area
Western Ridge Southern Tenements Flora and Vegetation Desktop Assessment	Onshore (2016)	Partially overlaps Survey Area
Whaleback AML 7/244 Flora and Vegetation and Vertebrate Fauna Review	Onshore (2013)	Adjacent north
Western Ridge E52/3448 Desktop Flora and Fauna Assessment	Onshore (2018)	Adjacent north

### 3.2 Survey Type, Timing, and Weather

A single season reconnaissance flora and vegetation survey was requested by BHP WAIO. The field survey was undertaken over eight days, equivalent to approximately 168 person hours, between 24 and 31 March 2021 (including mobilisation and demobilisation). An additional field survey was undertaken for the western portion between 12 March 2022 and 14 March 2022, equivalent to 64 person hours. The day time climatic conditions during both field surveys (hot temperatures and clear skies; BoM, 2022) were suitable to complete the survey on foot.

Rainfall in the months preceding field surveys was variable, with below long-term averages recorded through most of the dry season. Rainfall was below long-term averages for most of the 2020-2021 wet season as well, except February which recorded well above the long-term average for the month (169 mm) (Figure 3.1). The weeks preceding the 2021 survey received well below-average rainfall, with March recording 6.6 mm compared to the average of 41.7 mm, with all March rainfall occurring prior to the field survey. Rainfall in the 2021-2022 wet season was well below average (December to March saw 126.6 mm as opposed to the long-term average (LTA) of 215.9 mm). Prior to the survey of the western portion, there had been no rainfall for 25 days. However, conditions within the Survey Area were still relatively wet, with numerous annual or short-lived perennial flora taxa growing at the time of each field survey.



**Figure 3.1: Monthly and long-term average rainfall and climatic data for Newman Airport (station 7176; BoM, 2022).**

### 3.3 Survey Team and Licensing

Field surveys were managed by Mr Clinton van den Bergh and Carmel Winton, who both meet the minimum requirements (5+ years' experience in the bioregion) to lead and manage a flora survey in the Pilbara. Field leads were assisted in the field by senior ecologist Mary van Wees and botanist Emma Marsh, both of whom have recent survey experience in the Pilbara bioregion. Details of the survey team and licences are provided in Table 3.3.

**Table 3.3: Survey team and licensing**

Team Member	Role	Survey Dates	Flora Licence	Threatened Flora Licence	Experience
Clinton van den Bergh	Principal botanist and field survey lead	24 – 31 March 2021	FB62000105	TFL 59-1819	14+ years
Mary van Wees	Senior ecologist	24 – 31 March 2021	-	-	5+ years
Carmel Winton	Senior botanist and field survey lead	12 – 14 March 2022	FB62000134	TFL 134B-2021	7+ years
Emma Marsh	Botanist	12 – 14 March 2022	FB62000233-3	-	2.5 years

### 3.4 Field Survey

#### 3.4.1 Reconnaissance Flora and Vegetation Survey

Aerial photography (Scale 1:15,000) of the Survey Area and Google Earth Pro®, were used with previous vegetation mapping (Beard, 1975; Shepherd *et al.*, 2002) and soil landscape mapping (Northcote *et al.*, 1960-1968), to determine broad preliminary vegetation type boundaries prior to the field survey. Reconnaissance surveys are traditionally sampled at a low intensity via relevés (unmarked area within which data is collected; EPA, 2016a) and mapping points (unmarked area within which the vegetation unit and condition is broadly described).

Where practical, at least one sampling site (relevé) was established in each of the preliminary vegetation type areas (Figure 3.2), to ensure that each vegetation type occurring within the Survey Area was captured by the survey and described appropriately in accordance with EPA (2016b) guidelines. The entire Survey Area was accessible via vehicle and on foot, with all the major landforms and vegetation units traversed and sampled.

A total of 148 relevé sites were sampled across the Survey Area, while an additional 21 relevé sites were sampled within the Paddy Bore Survey Area (Table 3.4; Appendix C). Forty-six mapping notes were taken to assist with delineating vegetation and condition boundaries. Dominant vascular flora taxa within each relevé were recorded. Taxa not yet recorded from relevés or during site traverses, were also recorded to document a comprehensive species list for the Survey Area. A brief summary of the condition and vegetation assemblage at each site was also recorded to aid in producing vegetation unit descriptions (NVIS Technical Working Group, 2017). In addition, the following information was recorded at each relevé:

- relevé number;
- date of survey;

- personnel;
- a central GPS coordinate (GDA 94);
- site photograph of the representative vegetation unit, generally facing south-east;
- soil characteristics (texture and colour);
- geology (type, size and nature of any rocks, stones, gravel, or outcropping);
- topography (landform type and aspect);
- vegetation condition (Appendix E);
- vegetation structure, including the dominant flora species in the three traditional strata, upper, mid, and lower;
- disturbance (if present);
- approximate time since last fire; and
- GPS coordinates for significant or introduced flora.

Flora taxa observed opportunistically in the vicinity of sample sites, or while traversing the Survey Area, were also recorded. For any populations of taxa known to be of significance or introduced, a GPS location and a count of the individuals present, or percentage foliage cover for a given area, were recorded (see Section 3.4.2).

**Table 3.4: Sample sites (relevés) for each Survey Area**

Pipeline Survey Area	Paddy Bore Survey Area
<b>2021 Field Survey</b>	
WRP-001 to WRP-003, WRP-019 to WRP-111, WRP-116 to WRP-129	WRP-004 to WRP-018, WRP-100, WRP-112 to WRP-115, WRP-130
<b>2022 Field Survey</b>	
PDP-01 to PDP-39	n/a

### 3.4.2 Targeted Searches

Prior to the survey, a list of significant flora known, highly likely, likely, or possible, to occur within the Survey Area was compiled as part of the desktop assessment. Field personnel familiarised themselves with photographs, reference samples and descriptions of these taxa before conducting the survey. Once on the ground, personnel actively searched while traversing the Survey Area focussing on habitat and features considered likely to support significant flora (i.e., hill summits, gorges, and drainage lines) (Figure 3.2).

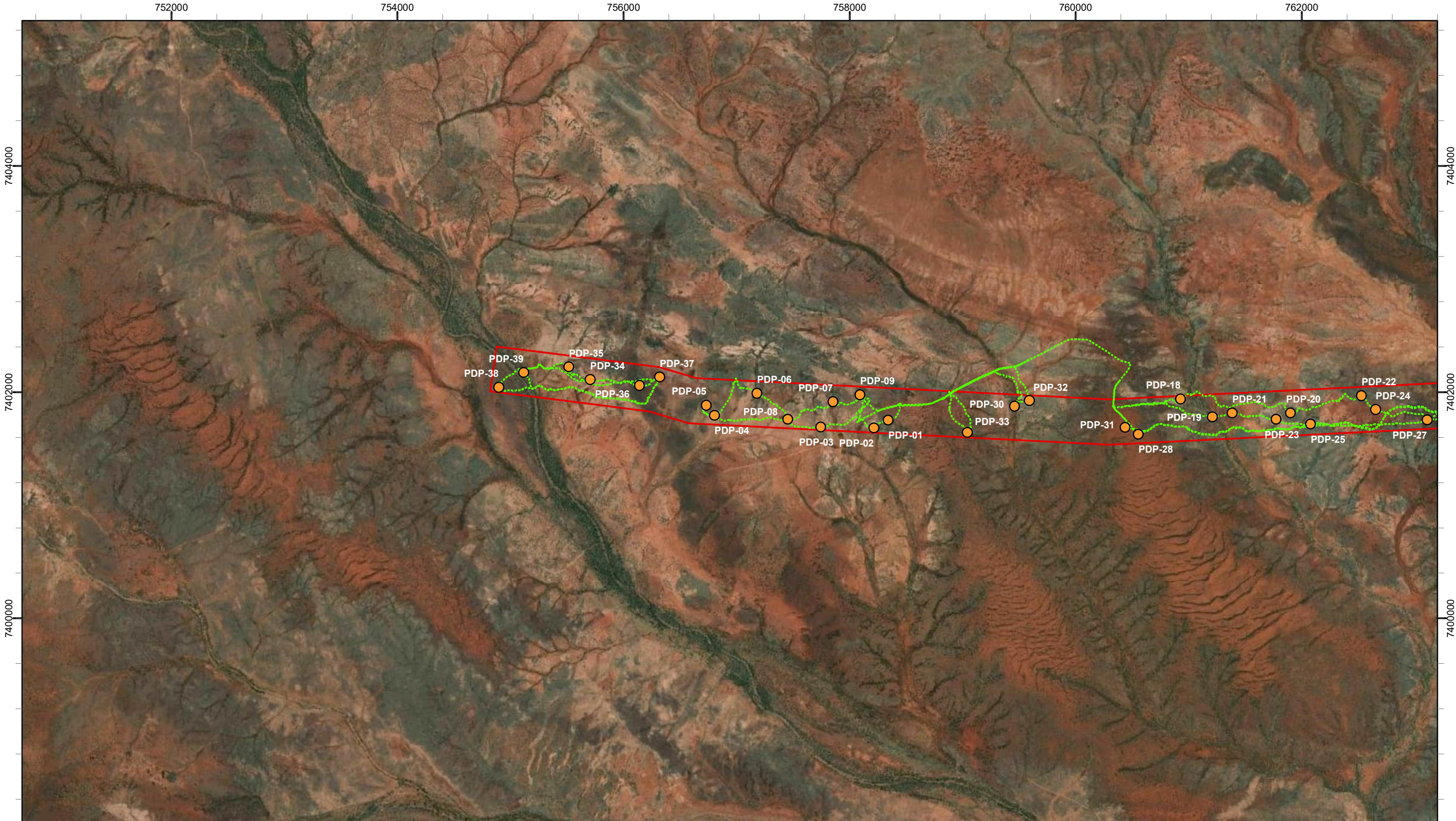
Where significant flora taxa were located in the field, a GPS coordinate of the individual was taken, or if the species existed within a small population, a central coordinate with an approximate 20 m radius was used. For larger populations the extent was mapped using a GPS to record the spatial extent of the population. Generalised information was collected for each occurrence, including an estimate of the number of individuals, reproductive status, condition and broad vegetation community and condition.



*Threatened and Priority Flora Report Forms* will be provided to the Parks and Wildlife Division (Parks and Wildlife) of DBCA, as required under the flora collecting permits. Significant flora specimens will be vouchered with the Western Australian Herbarium (WAH), where required and appropriate.

The targeted searches also focused on significant environmental weeds (WoNS and DPs listed under Section 22 of the BAM Act). Any such weeds located in the Survey Area had their locations noted and searches were conducted within a minimum radius of 20 m from the given specimen, to document the number of individual plants and map the spatial extent of the infestation.





- Legend**
- Survey Area
  - Relevé
  - ⋯ Traverse

N

Scale: 1:31,300

0

0.5

1

1.5

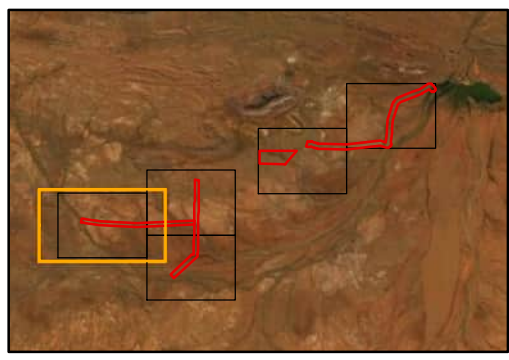
Km

Coordinate System: GDA 1994 MGA Zone 50

Projection: Transverse Mercator

Datum: GDA 1994

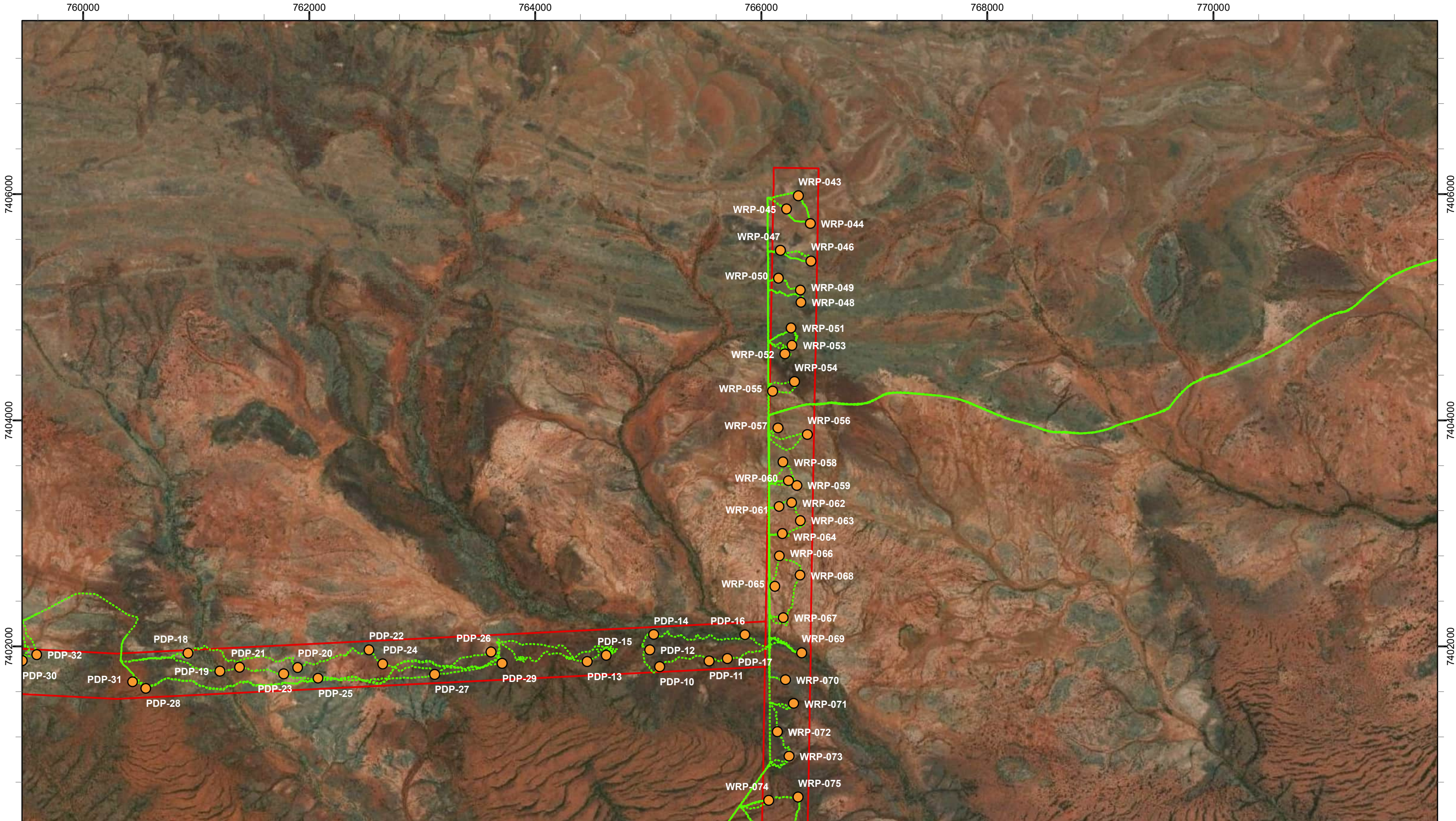
Created 23/05/2022



**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 3.2a: Flora sample**  
**sites and traverses**






**Legend**

Survey Area      ● Relevé

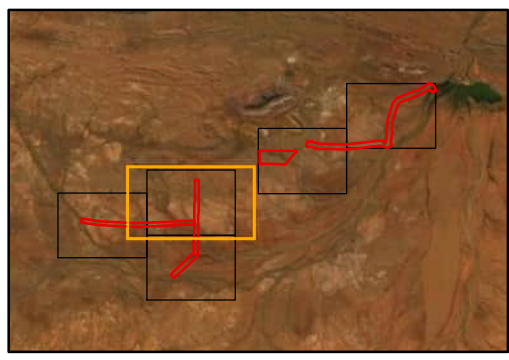
- - - Traverse

  
**biologic**  
Environmental Survey

Scale: 1:31,300

0      0.5      1      1.5  
Km

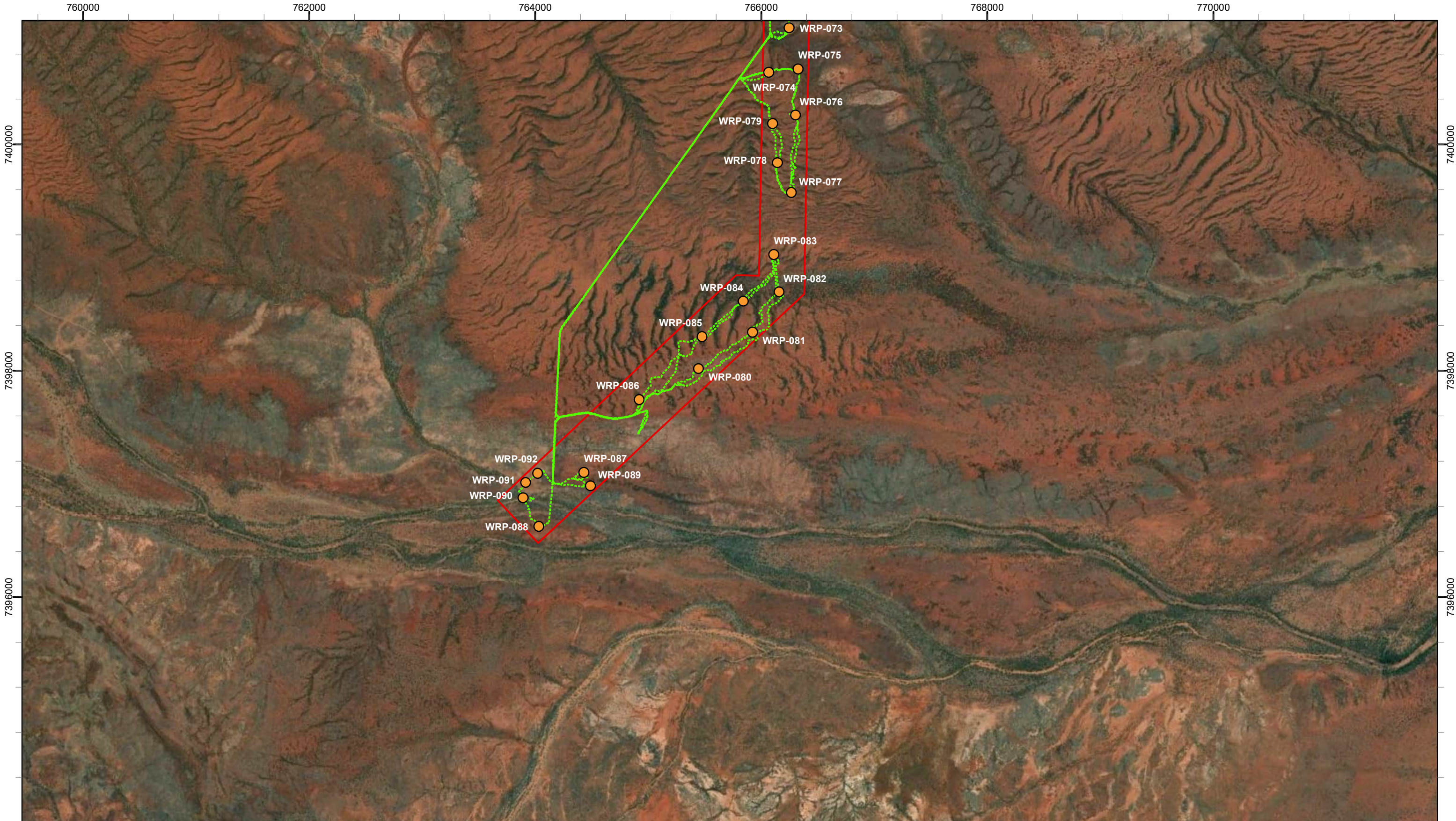
Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994      Created 23/05/2022




**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**


**Figure 3.2b: Flora sample**  
**sites and traverses**







**Legend**

 Survey Area       Relevé

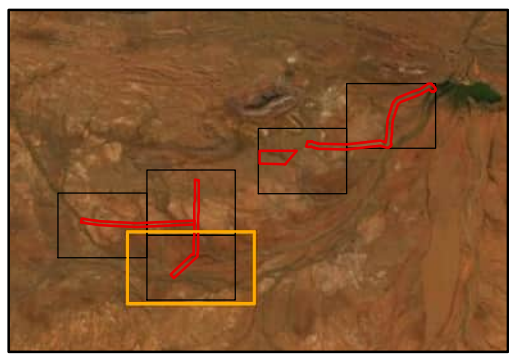
 Traverse

Scale: 1:31,300

0      0.5      1      1.5  
Km

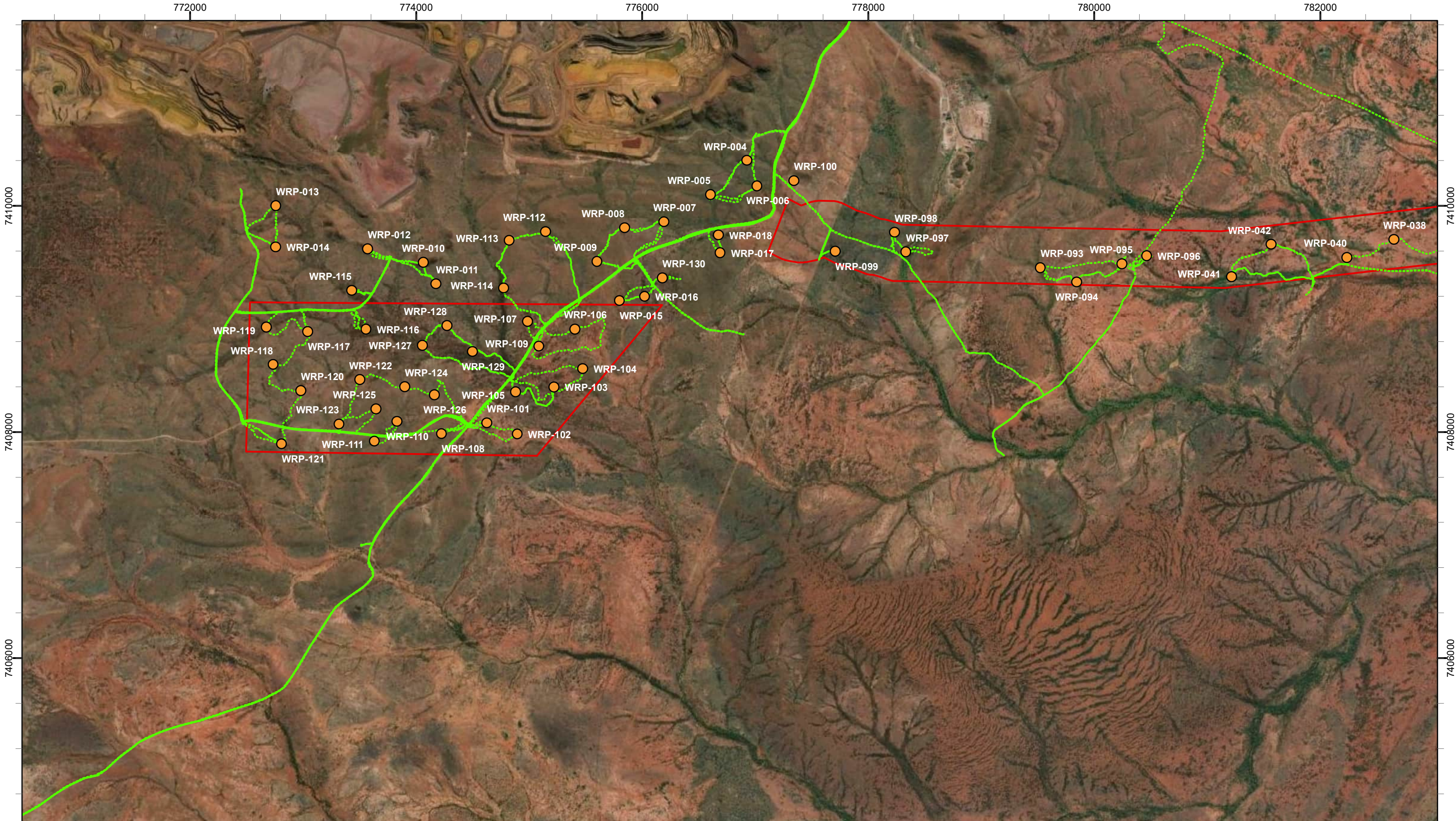
Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994      Created 23/05/2022



**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 3.2c: Flora sample**  
**sites and traverses**






**Legend**

Survey Area     ● Relevé

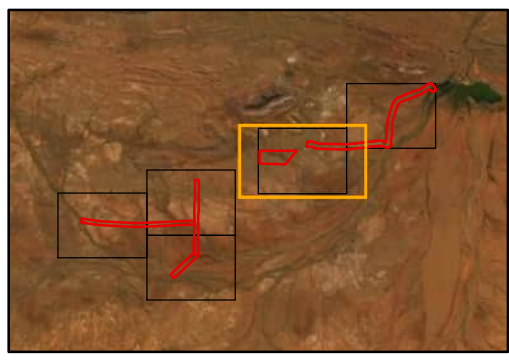
--- Traverse



Scale: 1:31,300

0     0.5     1     1.5  
Km

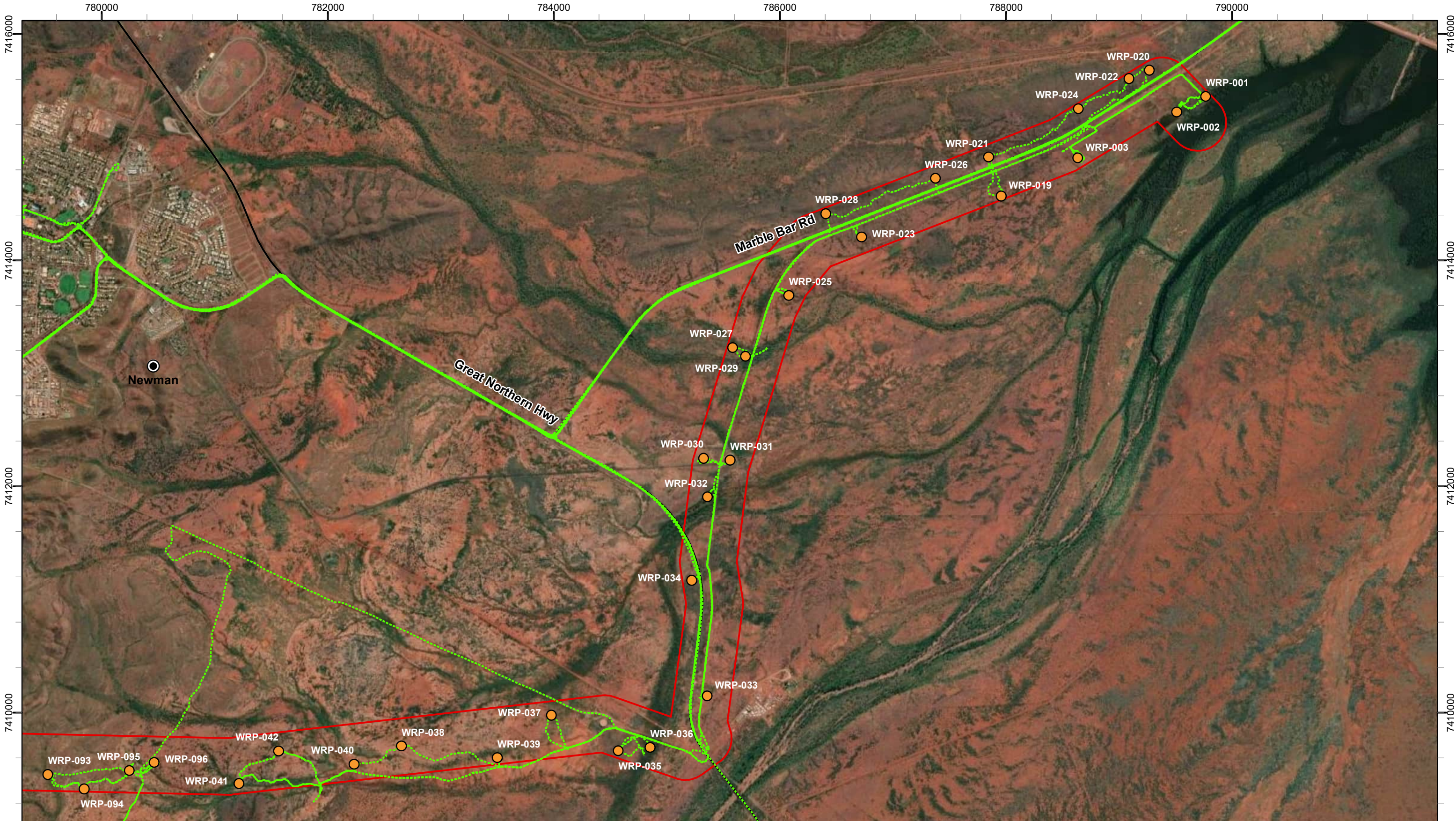
Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994     Created 23/05/2022



**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**


**Figure 3.2d: Flora sample**  
**sites and traverses**





- Legend**
- Survey Area
  - Relevé
  - State Road
  - - - Traverse

N

  
Environmental Survey

0

0.5

1

1.5

Km

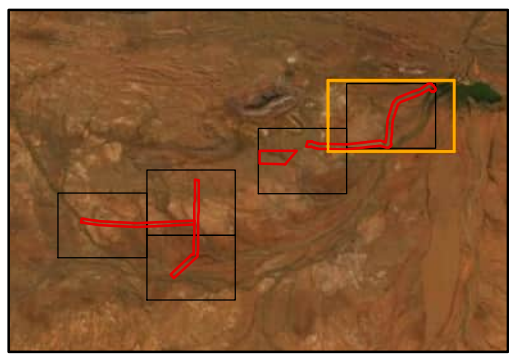
Scale: 1:31,300

Coordinate System: GDA 1994 MGA Zone 50

Projection: Transverse Mercator

Datum: GDA 1994

Created 23/05/2022



**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 3.2e: Flora sample**  
**sites and traverses**



### 3.4.3 Flora

#### *Nomenclature and Specimen Identification*

Plant taxa that could not be identified during the field survey were collected, assigned a unique number for tracking purposes, and pressed for subsequent identification. Identifications were carried out by Biologic taxonomists, Dr Rachel Meissner, and Mr Samuel Coultas, utilising the WAH's reference collection, taxonomic keys, and reference material. All taxa were checked against Florabase® (version 2.9.31; WAH, 1998-) to ensure their currency and validity.

Specimens of flora taxa that were Threatened, Priority listed, unique or unusual, range extensions or new weed species for the region have been verified and vouchered (if appropriate) at the WAH.

### 3.4.4 Vegetation

#### *Vegetation Mapping*

Broad vegetation mapping was conducted in the field, with vegetation boundaries delineated over aerial photography. Following the completion of sampling and taxonomic identifications, broad vegetation units were refined based on the review of floristic data collected from the quadrats and relevé. The vegetation mapping was then digitised using geographic information systems (GIS) software.

Vegetation types were delineated and described from aerial imagery utilising flora sampling data. The vegetation structure information collected from the quadrats, relevé and mapping points was reviewed to describe the vegetation types based on the dominant taxa, foliar cover, and height of the three traditional strata (upper, mid and lower/ground) (Appendix D). This method of vegetation type determination is consistent with EPA (2016b) and BHP (2018).

The vegetation types have been described to Level 5 (Vegetation Association) in the NVIS hierarchical structure (NVIS Technical Working Group, 2017) and coded in accordance with BHP (2018) standards. Landforms for each vegetation type were denoted at the start of each vegetation code e.g., vegetation type FP AaAinAte(±ExEg) CcEnpoChf BbClvAbl occurred on floodplains as denoted by 'FP'. Vegetation types which occurred across more than one landform were classified based on the landform which was most common. Where relevant and appropriate, the vegetation mapping was completed to ensure consistency between the Survey Area and adjacent or nearby vegetation mapping previously surveyed by Biologic (Biologic, 2020a, 2020b). The mapping reliability is high across the Survey Area, with the majority of the Survey Area traversed and all vegetation units sampled.

#### *Vegetation Condition*

Vegetation condition was defined within the Survey Area using the BHP (2018) vegetation condition scale which has been adapted from Keighery (1994) and Trudgen (1988), and is also presented in the EPA Technical Guidance (EPA, 2016b) (Appendix E). The vegetation condition was determined based on the level of disturbance observed in the area. Condition was recorded at each sampling site, while additional notes were taken while traversing the Survey Area and used to broadly map



vegetation condition boundaries. The vegetation condition mapping was then digitised using GIS software.

### *Groundwater Dependent and Sheet Flow Dependent Vegetation*

The Survey included an assessment of vegetation that may be reliant on groundwater for part or all of their lifecycle. The determination of groundwater dependency was undertaken with a review of the flora assemblage present within the Survey Area and a review of the literature. The review concentrated on flora species that are considered obligate/ facultative phreatophytes or mesophytic/ hydrophytic flora species.

The reconnaissance flora and vegetation survey delineated and described communities that are, or could potentially be, sheet-flow dependent determined through landform position, vegetation patterning and species composition. Contextual information (i.e., land system mapping) was also used to determine the occurrence of sheet-flow dependent ecosystems.

## 3.5 Assessment of Occurrence

Significant flora species identified in the desktop assessment were assessed per taxa for their likelihood of occurrence in the Survey Area. Biologic utilises botanical expertise and a decision matrix to guide a preliminary assessment prior to mobilisation. Following the field survey, the occurrence assessment is reviewed taking into account ground-truthing of existing significant flora records and presence of suitable habitat. The decision matrix is outlined at Table 3.5. Appendix F presents the full occurrence assessment table with both preliminary (pre-survey) and revised (post-survey) likelihood of occurrence.

**Table 3.5: Assessment of Occurrence Decision Matrix**

		Habitat Categories (within the Survey Area)			
		Core/ critical habitat present	Suitable habitat present/ within known distribution	Marginal habitat present/ adjacent to known distribution	No suitable habitat present/ outside of known distribution
Species Records / Occurrence Categories	Recorded in the Survey Area	Confirmed	Confirmed	Confirmed	Confirmed
	Recorded within <5 km	Highly Likely	Likely	Possible	Possible
	Recorded within 5-15 km	Likely	Possible	Possible	Unlikely
	Recorded within 15 -40 km	Possible	Possible	Unlikely	Unlikely
	Recorded >40 km	Possible	Unlikely	Unlikely	Highly Unlikely
	Species considered locally/regionally extinct	Unlikely	Unlikely	Highly Unlikely	Highly Unlikely

### 3.6 Potential Limitations and Constraints

There are a number of possible limitations and constraints that can affect the adequacy of vegetation and flora surveys (EPA, 2016b). The limitations of the current assessment are presented in accordance with the Technical Guidance (EPA, 2016b) (Table 3.6).

**Table 3.6: Survey limitations and constraints**

Limitation	Constraint	Comment
Availability of contextual information at a regional and local scale	No	Sufficient contextual information was available for the Survey Area, including broad information on land systems and vegetation associations. The Survey Area is located immediately southwest of the Mt Whaleback mine operated by BHP. An extensive amount of biological survey work has occurred across Mt Whaleback and surrounds, as well as surveys within the Survey Area, the data, and reports of which were all available for this assessment.
Competency/experience of the team carrying out the survey, including experience in the bioregion surveyed	No	The surveys were led by a Principal Botanist with over 14 years' experience, and a Senior Botanist with over 7 years of experience. The lead botanist met the minimum requirements to manage a flora and vegetation field survey in the Pilbara bioregion (EPA, 2016b).
Proportion of flora recorded and/or collected, any identification issues	No	The reconnaissance survey was designed to document broad information about the Survey Area. The information collected was sufficient for the survey purpose.
Was the appropriate area fully surveyed (effort and extent)	No	The Survey Area was traversed and surveyed on foot with all major vegetation types visited. The Survey Area was more than 2,169 ha in size, and it was not feasible to traverse the entire Survey Area. The survey intensity and coverage (related to relevé sampling) match that of which is required for a reconnaissance survey and is not considered to be a constraint (see Section 4.4).
Access restrictions within the survey area	No	The Survey Area was accessed via mining, exploration and pastoral tracks which provided access across most of the Survey Area. Much of the Survey Area was traversed with the survey completed on foot and via vehicle.
Survey timing, rainfall, season of survey	No	The survey was undertaken during a period which is considered to be optimal, between March and June for the Eremaean region (EPA, 2016b). A substantial amount of rainfall was received in the February prior to the 2021 survey (169.0 mm compared to the LTA of 72.3 mm), however, the weeks preceding the survey in March received well below-average rainfall. The wet season preceding the 2022 survey had variable rainfall, with December and January receiving well below average rainfall, and February receiving relatively average rainfall. Only a small percentage of specimens (approximately 4.8 %) were not confidently identified down to species or subspecies level. Furthermore, the Survey Area contained numerous annual or short-lived perennial flora, particularly annual grasses. The pre-survey conditions and survey timing were therefore not a constraint.
Disturbances that may have affected the results of survey such as fire, flood or clearing	No	Sections of the Survey Area are located within active pastoral leases and close to current mining operations. Disturbances recorded during the survey included grazing, trampling, weeds, and tracks. Disturbances were highest within areas that have high cattle visitation (i.e., drainage lines and mulga flats). These disturbances did not limit the results of the survey.



## 4 RESULTS

### 4.1 Desktop Assessment

The results and outcomes of the review of 37 flora and vegetation reports identified from the literature review are presented in Appendix G. The literature review identified 15 significant flora taxa as having been previously recorded in close proximity to the Survey Area; *Acacia subtiliformis* (P3), *Aristida jerichoensis* var. *subspinulifera* (P3), *Aristida lazaridis* (P2), *Eremophila magnifica* subsp. *magnifica* (P4), *Eremophila magnifica* subsp. *velutina* (P3), *Euphorbia australis* var. *glabra* (P3) (recorded as *Euphorbia* sp. Mt Bruce flats (S. van Leeuwen 3861) (P2)), *Goodenia nuda* (P4), *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) (P3), *Gymnanthera cunninghamii* (P3), *Indigofera gilesii* (P3), *Ipomoea racemigera* (P2), *Isotropis parviflora* (P2), *Lepidium catapycnon* (P4), *Rhagodia* sp. Hamersley (M. Trudgen 17794) (P3), and *Triodia* sp. Mt Ella (M.E. Trudgen 12739) (P3). All of these taxa were also identified by one or more of the database searches, with the exception of *Euphorbia australis* var. *glabra* (P3).

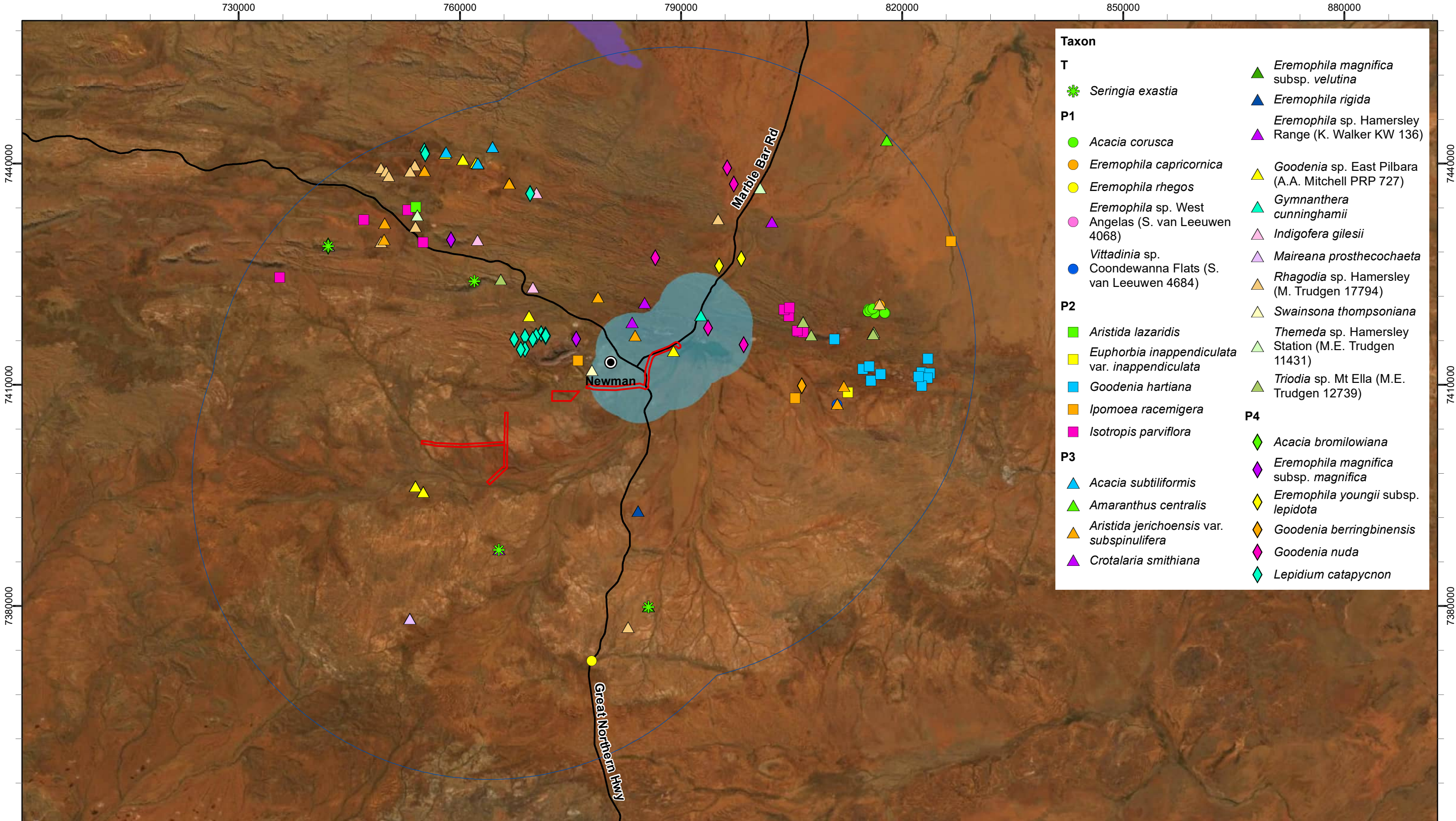
One DP and WoNS was also recorded in close proximity to the Survey Area (\**Tamarix aphylla*; ENV, 2012). The 37 reports, excluding Onshore (2014a) which includes all of BHP WAIO Pilbara tenure, did not identify any significant vegetation associations occurring near the Survey Area (Appendix G). However, one vegetation association identified from Onshore (2016) was closely affiliated to the West Angelas Cracking-Clays PEC (Priority 1).

#### 4.1.1 Flora of Significance

A total of 35 significant flora taxa (those listed under the EPBC Act, BC Act, or DBCA's Priority List) were identified from the database searches (within 40 km of the Survey Area) (Appendix H, Figure 4.1). Of the 35 taxa, one is listed as Threatened, six are listed as Priority 1 taxa, six are listed as Priority 2 taxa, 16 are listed as Priority 3, and six are listed as Priority 4 taxa.

An occurrence assessment was conducted prior to mobilisation (see Table 3.5, full list at Appendix F). One taxon, *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) (P3), was determined as highly likely to occur, two flora taxa (*Swainsona thompsoniana* (P3) and *Goodenia nuda* (P4)) were determined as likely to occur, and seven were determined as possible to occur in the Survey Area (Table 4.1). The rest of the significant taxa identified pre-survey included 22 considered unlikely to occur, and three considered highly unlikely to occur within the Survey Area.





**Legend**

Survey Area

Study Area

State Road

**DBCA TEC/PEC**

Ethel Gorge - Endangered

Fortescue Valley Sand Dunes - Priority 3

N

biologic

Environmental Survey

Scale: 1:480,000

0

10

20

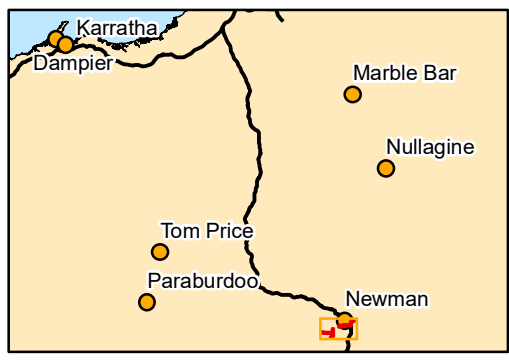
Km

Coordinate System: GDA 1994 MGA Zone 50

Projection: Transverse Mercator

Datum: GDA 1994

Created 23/05/2022



**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 4.1: Significant flora**  
**and ecological community**  
**database search results**



**Table 4.1: Occurrence assessment of significant flora, preliminary classification.**

Taxon	Description (WAH, 1998-)	Location
<b>Highly Likely</b>		
<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727) (P3)	Open, erect annual or biennial, herb, to 0.2 m high. Fl. yellow. Red-brown clay soil, calcrete pebbles. Low undulating plain, swampy plains.	0.4 km SE
<b>Likely</b>		
<i>Swainsona thompsoniana</i> (P3)	Prostrate annual herb, to 0.2m high, Fl. blue. Higher altitude floodplains, top of hilltops and cracking clays on red-brown clay.	1.5 km N
<i>Goodenia nuda</i> (P4)	Erect to ascending herb, to 0.5 m high. Fl. yellow, Apr to Aug. Mulga hardpan plains, undulating plains, floodplains, minor drainage lines on red sandy-loams, clay-loams.	> 0.1 km N
<b>Possible</b>		
<i>Hibiscus campanulatus</i> (P1)	Erect bushy shrub, 1-3.5 m high. Fl. White/pale pink. Brown loamy to skeletal soils. Rocky gullies, ironstone range.	10 km NW
<i>Ipomoea racemigera</i> (P2)	Creeping annual, herb or climber. Fl. white.	14.9 km ENE
<i>Isotropis parviflora</i> (P2)	Shrub, 0.1 m high. Fl. white/pink, Mar. Valley slope of ironstone plateau.	7.5 km NNW
<i>Aristida jerichoensis</i> var. <i>subspinulifera</i> (P3)	Compactly tufted perennial, grass-like or herb, 0.3-0.8 m high, lemma groove muricate. Hardpan plains.	3.3 km NW
<i>Gymnanthera cunninghamii</i> (P3)	Erect shrub, 1-2 m high. Fl. cream-yellow-green, Jan to Dec. Sandy soils.	4.8 km NE
<i>Indigofera gilesii</i> (P3)	Shrub, to 1.5 m high. Fl. purple-pink, May or Aug. Pebbly loam. Amongst boulders & outcrops, hills.	12.8 km NNW
<i>Lepidium catapycnon</i> (P4)	Open, woody perennial, herb or shrub, 0.2-0.3 m high, stems zigzag. Fl. white, Oct. Skeletal soils. Hillsides.	5.6 km NW

#### 4.1.2 Vegetation of Significance

Two Threatened Ecological Communities (TECs) listed under the BC Act are recognised for the Pilbara region of Western Australia (DBCA, 2018). Neither of these TECs are listed under the federal EPBC Act. One TEC, 'Ethel Gorge aquifer stygobiont community' (EN) was identified as occurring within 40 km of the Survey Area (partially overlapping Survey Area) during the database search (Figure 4.1). However, this TEC does not represent terrestrial vegetation and is not considered any further.

A total of 43 PECs are recognised for the Pilbara region, of which 34 are relevant for terrestrial vegetation (DBCA, 2020). One PEC was identified by the database search as occurring within 40 km of the Survey Area, 'Vegetation of sand dunes of the Hamersley Range/Fortescue Valley (previously Fortescue Valley Sand Dunes)' (Figure 4.1). This Priority three PEC consists of red linear iron-rich sand dunes on the Divide Land system at the junction of the Hamersley Range and Fortescue Valley, between Kalgan Creek and the low hills to the west. A small number are vegetated with *Acacia dictyophleba* scattered tall shrubs over *Crotalaria cunninghamii*, *Trichodesma zeylanicum* var. *grandiflorum* open shrubland. They are regionally rare, small and fragile and highly susceptible to threatening processes including weed invasion, grazing by cattle, altered fire regimes, erosion and clearing for mining and infrastructure (DBCA, 2020).

#### 4.1.3 Introduced Flora Taxa from Database Searches

The NatureMap (DBCA, 2021a), Protected Matters (DAWE, 2021), ALA (ALA, 2021) and WAOL (DPIRD, 2021) database searches identified a list 74 introduced taxa that may potentially occur within the Survey Area. The list of introduced taxa known to occur or potentially occur within the Survey Area (Appendix I) was reviewed to identify WoNS and DPs.

##### *Weeds of National Significance and Declared Pests*

Of the list of introduced taxa identified during the desktop assessment as occurring in or near the Survey Area, 30 are listed as WoNS (Appendix I). The 30 WoNS were identified from the WAOL database search for the entire Shire of East Pilbara and occur or may potentially occur within the shire boundaries. No other database search or literature review identified any WoNS. The 30 taxa include numerous *Opuntia* and *Cylindropuntia* species that are grouped together in the WoNS listing. The desktop assessment identified 48 DPs (including numerous cacti species that are all listed as DPs, Appendix I), previously recorded or potentially located within the Shire of East Pilbara.

The desktop assessment did not identify any WoNS or DPs as occurring within the Survey Area but identified *\*Tamarix aphylla* as occurring in close proximity to the Survey Area. *\*Tamarix aphylla* has previously been recorded approximately 5 km northwest of the Survey Area by GHD (2008b).

##### *Weed Prioritisation*

Fifteen introduced taxa have been identified by Parks and Wildlife as 'Priority Alert' weeds for the Pilbara region, comprising *\*Azadirachta indica*, *\*Calotropis procera*, *\*Chloris gayana*, *\*Clitoria ternatea*, *\*Cryptostegia grandiflora*, *\*Cylindropuntia* spp., *\*Euphorbia tirucalli*, *\*Jatropha gossypifolia*, *\*Lantana camara*, *\*Moringa oleifera*, *\*Ricinus communis*, *\*Schinus molle* var. *areira*, *\*Vachellia nilotica*, *\*Washingtonia robusta* and *\*Xanthium strumarium*.

No Priority Alert weeds have previously been recorded within the Survey Area. None of these introduced taxa are expected to occur in the Survey Area.

## 4.2 Field Survey

### 4.2.1 Flora

A total of 279 confirmed vascular flora taxa from 38 families and 115 genera were recorded from the Survey Area during the field survey. The total number of confirmed vascular flora taxa comprised 268 native taxa and eleven introduced taxa (Appendix J). The total number of confirmed vascular flora taxa recorded from the field survey increases to 295, comprising 284 native and eleven introduced taxa (Appendix J), when the taxa from the adjacent (north) Paddy Bore Survey Area are included in the total.

The dominant families equate to 50 % of the total taxa recorded and comprised Poaceae (57), Fabaceae (55), and Malvaceae (27). Of the 38 families recorded, 14 were represented by one taxon, which equates to 5 % of the total taxa recorded. The dominant genera make up 23 % of the total taxa recorded and comprised *Acacia* (27), *Senna* (14), *Ptilotus* (12), and *Eremophila* (11). Of the 115 genera recorded, 65 were represented by only one taxon, which equates to 23 % of the total taxa recorded.



An additional 14 specimens could not be confirmed due to lack of diagnostic material (i.e., flowers, fruit) for identification. Of these unconfirmed taxa, one was identified down to family level only (e.g., *Chenopodiaceae* sp. indet), six were identified to genus level only (e.g., *Abutilon* sp. indet), and seven were given tentative (?) identifications at the species level (e.g., *Eremophila* ?*platycalyx*). Five of these had corresponding specimens that were confidently identified (e.g., *Acacia* ?*adsurgens* and *Acacia* *adsurgens*; *Eremophila* ?*forrestii* and *Eremophila* *forrestii* subsp. *forrestii*). None of these unconfirmed specimens were expected to be taxa of significance.

#### 4.2.2 Significant Flora

##### *Threatened Flora*

The desktop assessment (as part of the EPBC Protected Matters Search Tool (PMST)) identified one Threatened flora taxon, *Pityrodia augustensis*. The PMST assesses species occurrences or likely occurrence based on records from multiple sources as well as bioclimatic distribution models for less well known taxa (DAWE, 2020), resulting in threatened flora appearing in search results that occur a substantial distance outside of the search parameters. All *Pityrodia augustensis* (T) records are restricted to Mount Augustus in the Gascoyne bioregion, more than 200 km southwest of the Survey Area, thus the taxon is highly unlikely to occur in the Pilbara or in the Survey Area.

The field survey recorded one Threatened taxon, *Seringia exastia*. A recent revision of the *Seringia* genus found that *Seringia exastia* (T) and *Seringia elliptica* (not threatened) are the same species, with the latter consequently being subsumed into *S. exastia* (Binks *et al.*, 2020). *Seringia exastia* (T), a species previously only known to occur in the Kimberley, now has a much more widespread distribution (primarily in the Pilbara and mid-West). A nomination to delist the species has been made to the WA Threatened Species Scientific Committee and is expected to be authorised. Until the change is officially made, *Seringia exastia* is still listed as Threatened, however for the purposes of this report it is not considered significant and will not be discussed further.

##### *Priority Flora*

The desktop assessment identified 34 priority listed flora taxa as potentially occurring within the Survey Area (refer to Section 4.1.1). One priority listed taxon was recorded from the Survey Area during the field survey: *Rhagodia* sp. Hamersley (M. Trudgen 17794) (P3) (Figure 4.2). An additional priority listed taxon, *Ipomoea racemigera* (P2), was found by a subsequent survey conducted by Biologic for BHP WAIO that overlapped the current Survey Area where Western Creek and an unnamed creek cross the southwest portion (Biologic, 2022).

##### *Ipomoea racemigera* (P2)

*Ipomoea racemigera* is described as a pilose, creeping annual herb or climber with twining stems (WAH, 1998-) (Plate 4.1). It has a cymose inflorescence bearing 1–2, funnel-shaped white flowers from March to August, or throughout the year under favourable conditions (WAH, 1998-). It closely resembles *Ipomoea plebeia*, differing only in having glabrous to very sparsely hairy upper leaf surfaces and moderately pilose lower surfaces, compared to the evenly pilose upper and lower surface of *Ipomoea plebeia* (Keybase, 2020). *Ipomoea racemigera* has previously been recorded on sandy soils occurring

along medium and major watercourses in the Pilbara region of Western Australia from Newman to Kununurra, as well as in similar habitats in the Northern Territory, South Australia, and Queensland (ALA, 2021; WAH, 1998-).

The WAH currently have thirteen records for *Ipomoea racemigera* (WAH, 1998-). Within the Survey Area, this taxon was recorded from six-point locations, totalling 56 individuals (Figure 4.2). An additional 528 individuals from 124-point locations were recorded by Biologic (2022) in the adjacent Western Creeks survey area. The taxon was found in vegetation type ME CcCsChf EvAci Aads which is considered to be groundwater dependent vegetation (see Section 4.2.4).



**Plate 4.1: *Ipomoea racemigera* (P2) (Biologic photos taken during Western Creeks survey)**

***Rhagodia* sp. Hamersley (M. Trudgen 17794) (P3)**

*Rhagodia* sp. Hamersley (M. Trudgen 17794) is a Priority 3 taxon which occurs in the Eremaean Botanical Province, in the Pilbara and Gascoyne regions (WAH, 1998-). It is described as a lax shrub or scramble with small lanceolate leaves and not aromatic compared to the common *Rhagodia eremaea* (Rio Tinto & WAH, 2015). *Rhagodia* sp. Hamersley (M. Trudgen 17794) produces small red drupelets following flowering, which can occur following favourable conditions (Rio Tinto & WAH, 2015) (Plate 4.2). It has been recorded from mulga on cracking clays, however Biologic has recorded *Rhagodia* sp. Hamersley (M. Trudgen 17794) from varying habitats including low rocky slopes, rocky drainage lines and stony plains near to, and north of Newman (unpublished survey data).

The WAH currently have 72 records for this species, while Biologic are aware of thousands of individuals near to, and north of Newman (unpublished survey data). In the Survey Area, *Rhagodia* sp. Hamersley (M. Trudgen 17794) was recorded from 59-point locations, totalling 66 individuals (Figure 4.2). The taxon was found in vegetation type SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri which is considered to be sheet-flow dependent vegetation (see Section 4.2.4).





**Plate 4.2: *Rhagodia* sp. Hamersley (M. Trudgen 17794) (P3) (photographs captured by Biologic staff during various 2021 surveys)**

### *Flora of Other Significance*

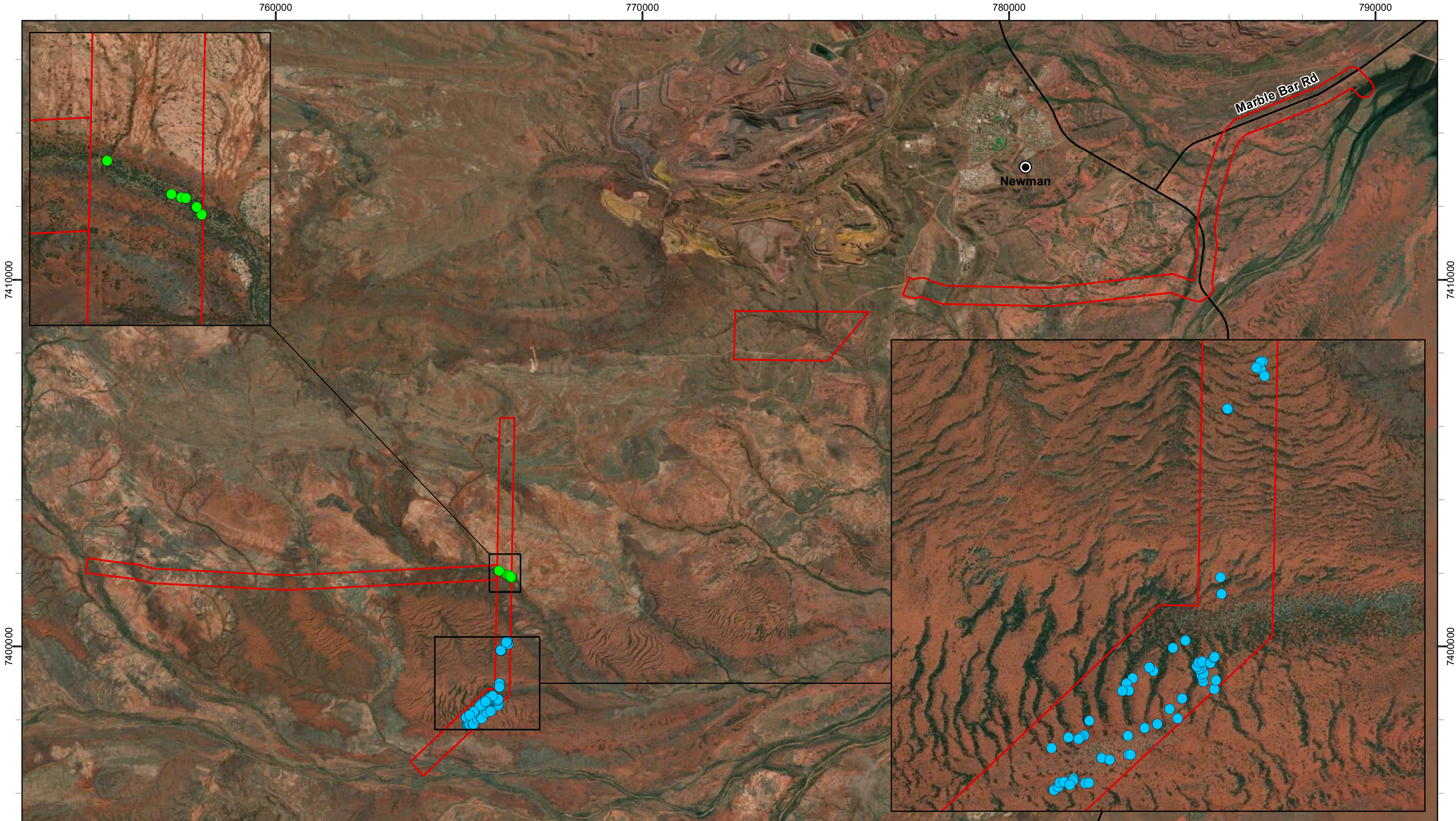
The EPA (2016b) advises that flora species, subspecies, varieties, hybrids and ecotypes may be considered significant for reasons other than listing as a Threatened or Priority Flora taxa. This may include, but is not limited to, range extensions, keystone species, relic status, local endemism, and anomalous features. Based on these features, ten taxa recorded from the Survey Area were flora of “other” significance (Table 4.2). Seven taxa are range extensions (RE) whereby the record from the Survey Area has considerably extended the known distribution. Two taxa filled substantial gaps in their known distributions, otherwise known as locality holes (LH). One taxon, *Senna artemisioides* subsp. *oligophylla* x hybrid, is a taxon which has hybridised, but is not considered locally or regionally significant.

**Table 4.2: Flora taxa of other significance**

Taxon	Significance	Description
<i>Abutilon fraseri</i> subsp. <i>fraseri</i>	LH	Locality hole between records around Karijini and Fortescue Marsh and two disjunct records over 900 km east on the border with NT. Closest record is approximately 90 km northwest.
<i>Acacia colei</i> var. <i>colei</i>	RE	Range extension to the south. Closest record approximately 162 km north.
<i>Corchorus incanus</i> subsp. <i>lithophilus</i>	RE	Range extension to the south. Closest record approximately 120 km northwest on the edge of Karijini NP.
<i>Corchorus parviflorus</i>	RE	Range extension to the south. Closest record is approximately 100 km north.
<i>Eriachne ciliata</i>	RE	Range extension to the southeast/ south. Closest record is approximately 174 km northwest.
* <i>Portulaca pilosa</i>	RE	This naturalised weed taxon is known from the Kimberley, and currently does not have any WAH records in the Pilbara. There are, however, a number of ALA records housed at other Australian herbariums, the closest of which is 166 km to the west of the Survey Area.

Taxon	Significance	Description
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x hybrid	Other	Hybridisation is a common occurrence for many Fabaceae genera. This taxon is not a recognised hybrid by WAH, nor is it considered to be locally or regionally significant.
<i>Tribulus platypterus</i>	LH	Fills a locality hole between Mt Egerton, Karijini and Karlamilyi National Parks. Closest record is approx. 137 km northwest, near Mulga Downs Station.
<i>Triumfetta clementii</i>	RE	Range extension to the southeast. Closest record is 129 km north.
<i>Vincetoxicum flexuosum</i>	RE	Range extension to the southeast. Closest record is approx. 118 km northwest near Gudai-Darri.






- Legend**
- Survey Area
  - State Road
- Taxon**
- *Ipomoea racemigera* - P2
  - *Rhagodia* sp. Hamersley (M. Trudgen 17794) - P3

N

**biologic**  
Environmental Survey



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Km

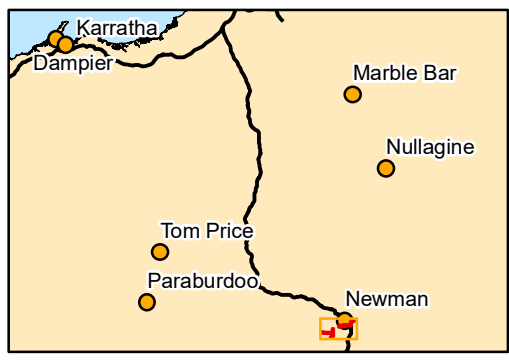
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Projection: Transverse Mercator

Datum: GDA 1994

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**Vegetation Survey**

**Figure 4.2: Flora of conservation**  
**significance recorded in the**  
**Survey Area**



### Introduced Flora

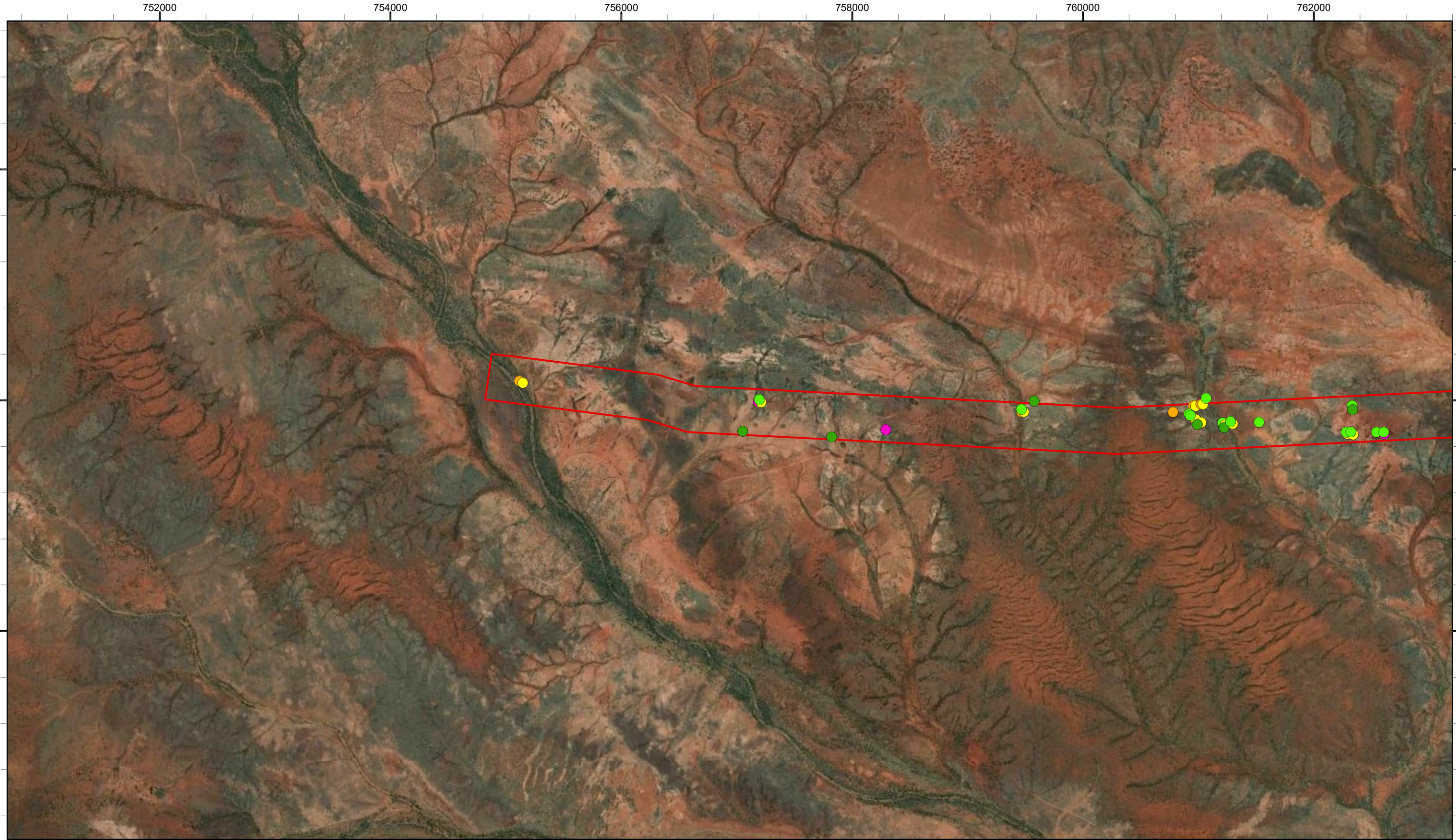
Eleven introduced taxa were recorded from the Survey Area (Figure 4.3, Table 4.3). None of the introduced taxa are listed as WoNS or DPs under the BAM Act, or as 'Priority Alert' weeds by Parks and Wildlife (DBCA).

The most frequently observed introduced flora taxa, *\*Cenchrus ciliaris*, *\*Cenchrus setiger*, *\*Bidens bipinnata*, and *\*Malvastrum americanum* were recorded in many of the floristic sites and opportunistically across the Survey Area (Figure 4.3, Table 4.3). *\*Cenchrus ciliaris* and *\*Cenchrus setiger* were recorded across all landforms but were more prevalent along drainage lines and associated floodplains, where particularly *\*Cenchrus ciliaris* was a dominant understorey species. *\*Cenchrus ciliaris* was commonly aerial seeded as a fodder crop for pastures and has since spread throughout arid and tropical regions of Australia (Hussey *et al.*, 2007). Spread occurs mainly by seeds transported through waterways, roads, and potentially by cattle. *\*Bidens bipinnata* was also more common along drainage lines but was also widespread across vegetation type SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri, which is subject to sheetflow. *\*Vachellia farnesiana* was most prevalent in the western portion, where it was recorded nine times. All remaining introduced species (*\*Aerva javanica*, *\*Citrullus amarus*, *\*Cynodon dactylon*, *\*Echinochloa colona*, *\*Portulaca pilosa*, and *\*Setaria verticillata*) were recorded from five or fewer locations.

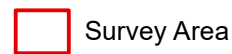
**Table 4.3: Occurrences of introduced flora**

Taxon	Lifeform	Number of Point Locations		Total Number of individuals
		Relevés	Opportunistic	
<i>*Cenchrus ciliaris</i>	Perennial grass	54	63	38,450
<i>*Cenchrus setiger</i>	Perennial grass	22	12	12,481
<i>*Bidens bipinnata</i>	Annual herb	32	10	6,805
<i>*Malvastrum americanum</i>	Perennial herb or shrub	21	13	1,725
<i>*Vachellia farnesiana</i>	Tree or shrub	5	11	131
<i>*Citrullus amarus</i>	Annual herb (climber)	2	3	39
<i>*Portulaca pilosa</i>	Annual herb	5	-	5
<i>*Echinochloa colona</i>	Annual grass	4	-	4
<i>*Aerva javanica</i>	Perennial herb	2	1	35
<i>*Cynodon dactylon</i>	Perennial grass	1	1	110
<i>*Setaria verticillata</i>	Annual grass	2	-	25





**Legend**



Survey Area

**Taxon**



*\*Bidens bipinnata*



*\*Cenchrus ciliaris*



*\*Cenchrus setiger*



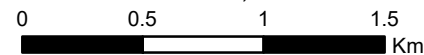
*\*Malvastrum americanum*



*\*Vachellia farnesiana*



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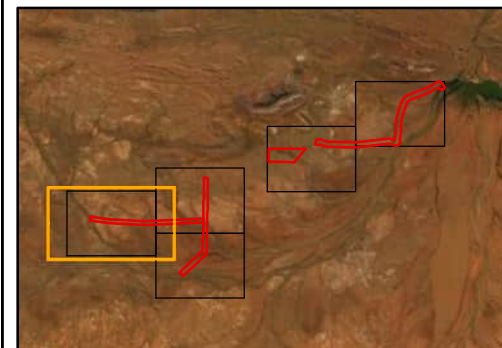


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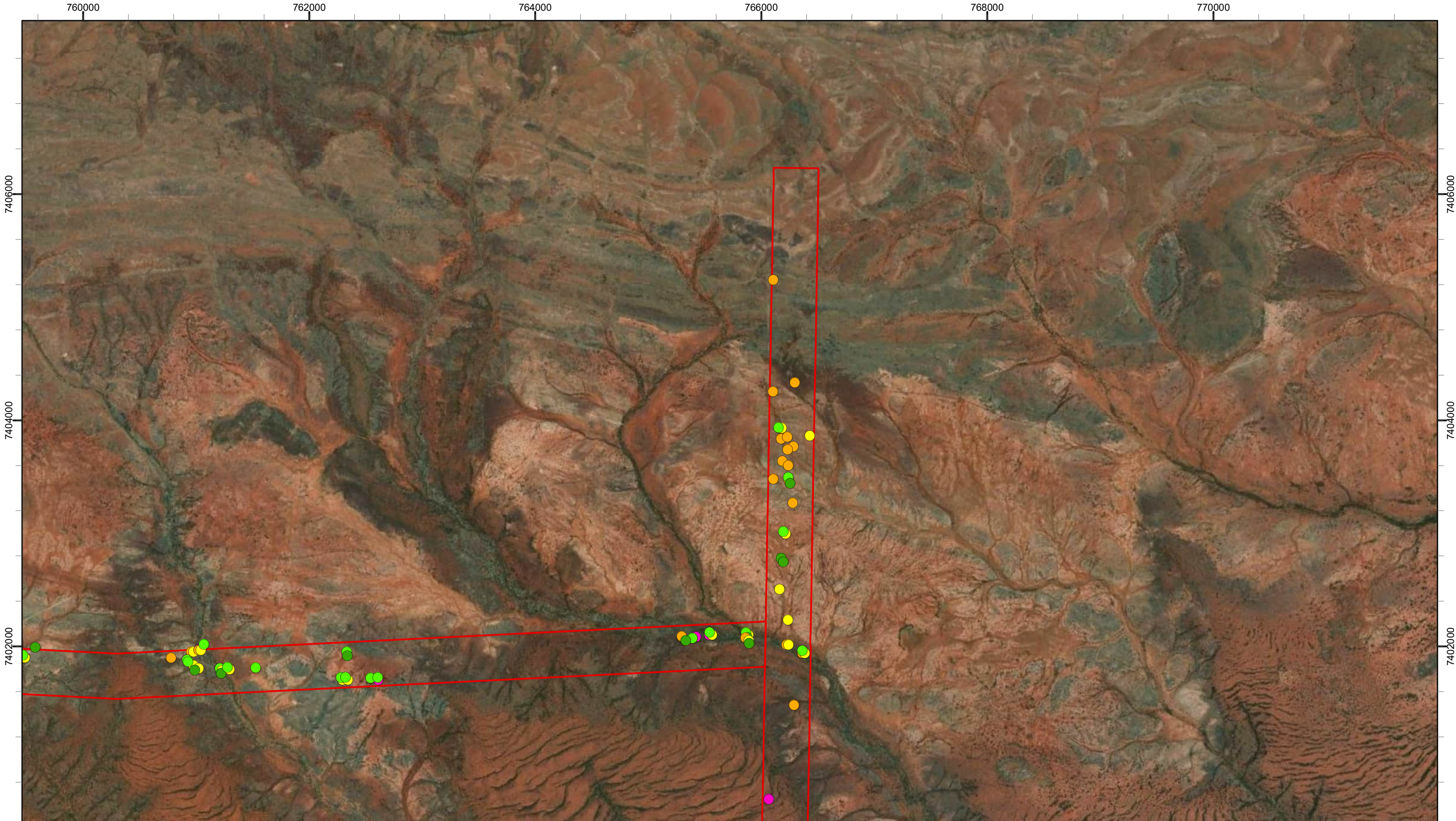








**BHP WAIO**


**Western Ridge Pipeline  
Reconnaissance Flora and  
Vegetation Survey**


**Figure 3.2a: Introduced flora  
recorded in the Survey Area**





- Legend**
-  Survey Area
- Taxon**
-  *\*Cenchrus setiger*
  -  *\*Bidens bipinnata*
  -  *\*Cenchrus ciliaris*
  -  *\*Malvastrum americanum*
  -  *\*Vachellia farnesiana*

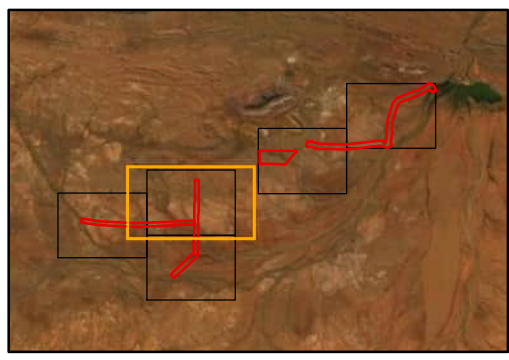




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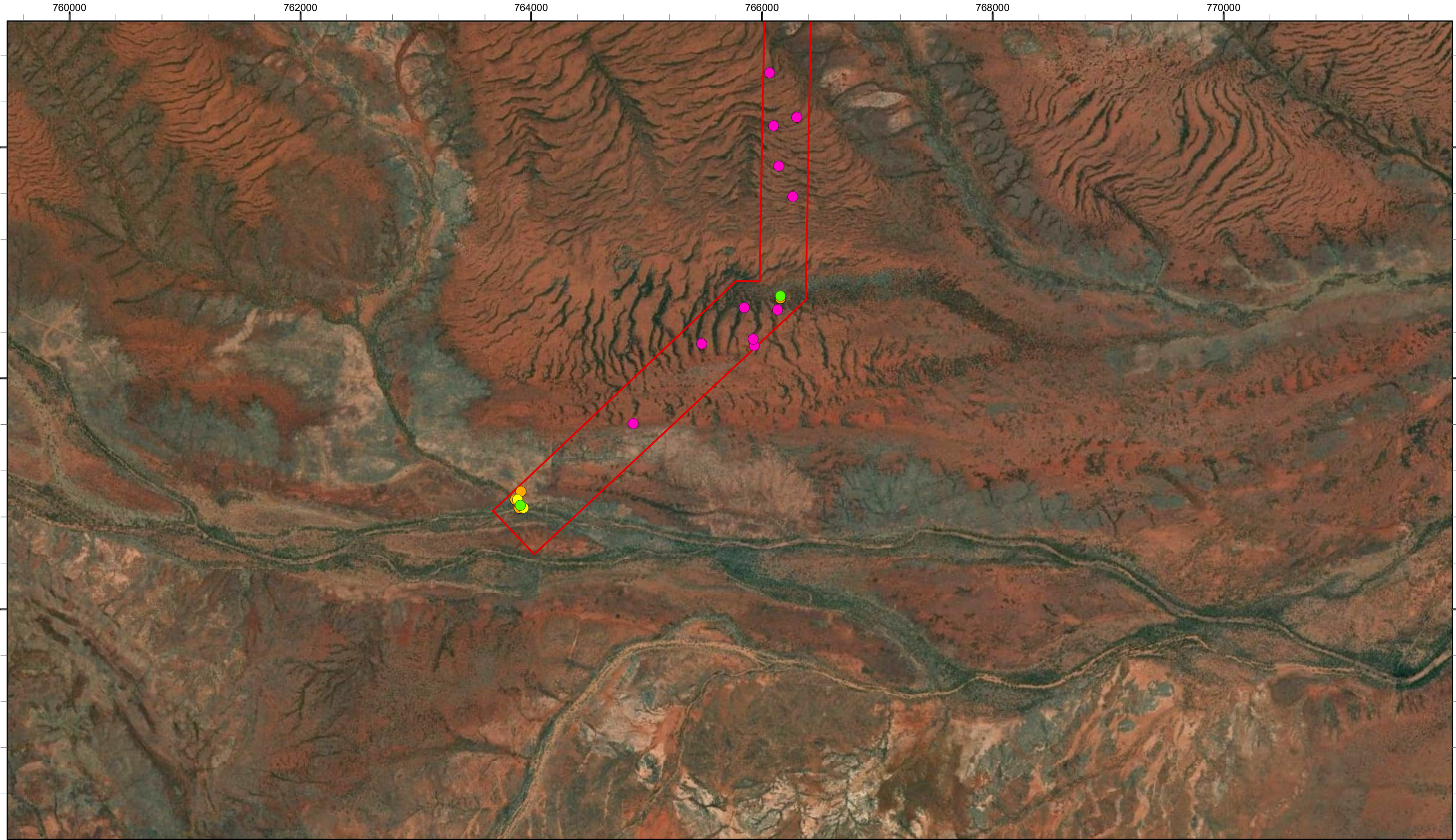
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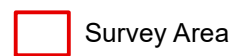
**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 3.2b: Introduced flora**  
**recorded in the Survey Area**





**Legend**



Survey Area

**Taxon**



*\*Bidens bipinnata*



*\*Cenchrus ciliaris*



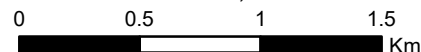
*\*Cenchrus setiger*



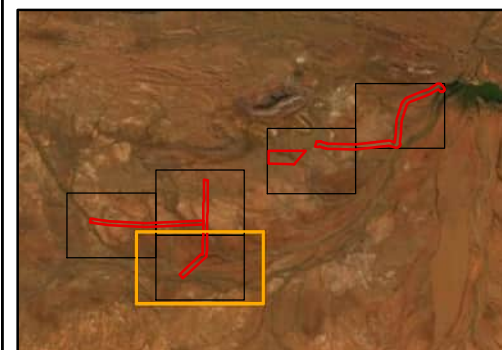
*\*Malvastrum americanum*



Scale: 1:31,300



Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994 Created 23/05/2022

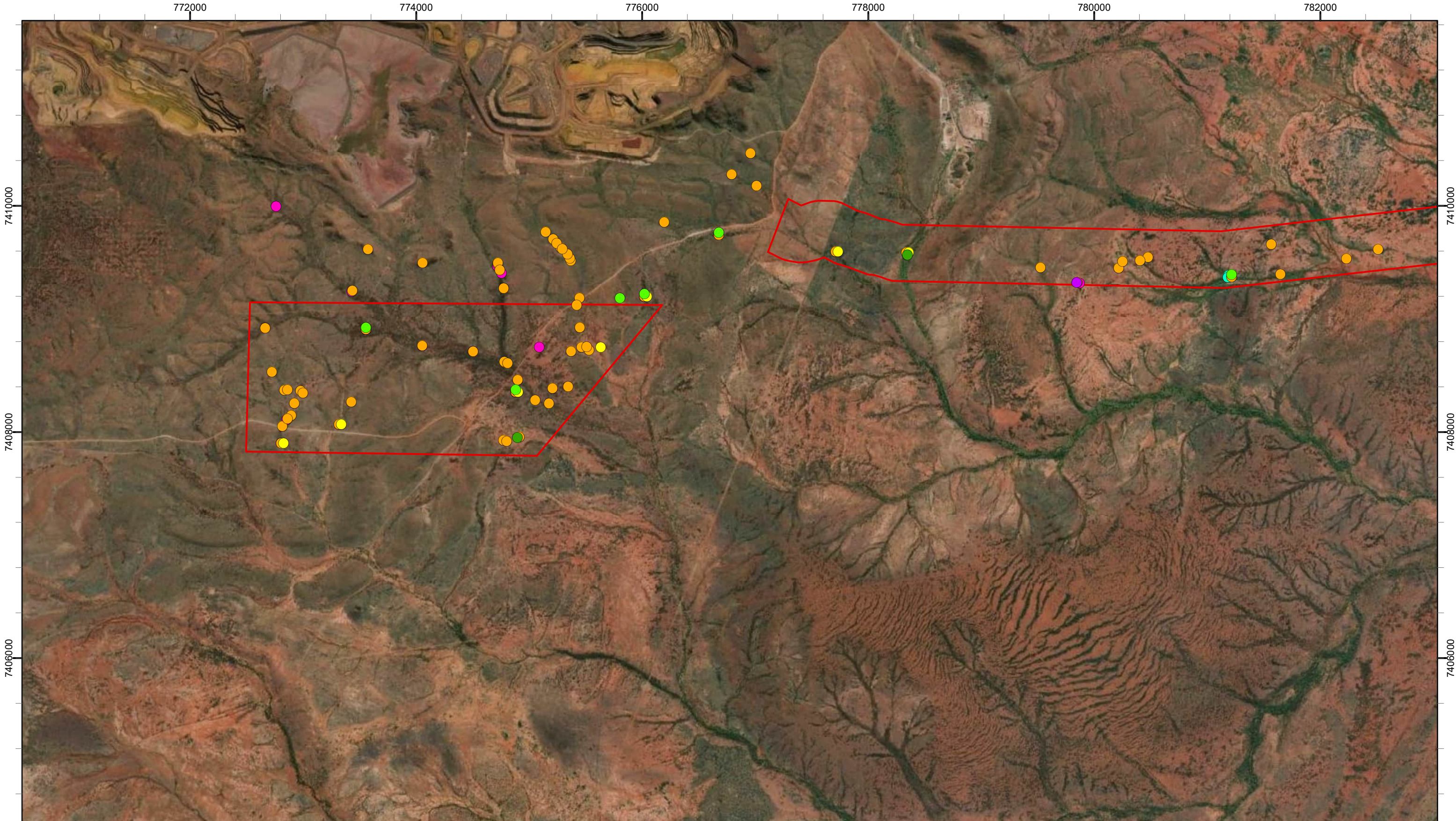


**BHP WAIO**



**Western Ridge Pipeline  
Reconnaissance Flora and  
Vegetation Survey**

**Figure 3.2c: Introduced flora  
recorded in the Survey Area**

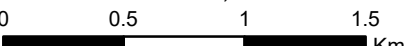




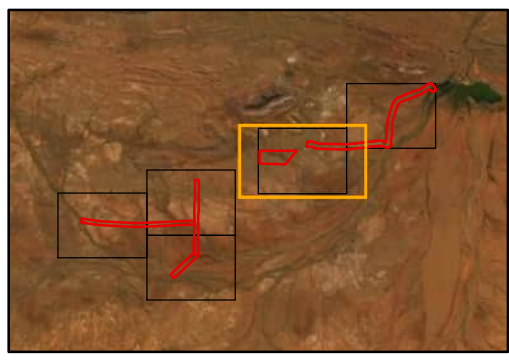
- Legend**
-  Survey Area
- Taxon**
- |                                                                                                               |                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
|  <i>*Aerva javanica</i>    |  <i>*Cenchrus setiger</i>      |
|  <i>*Bidens bipinnata</i>  |  <i>*Malvastrum americanum</i> |
|  <i>*Cenchrus ciliaris</i> |  <i>*Setaria verticillata</i>  |
|                                                                                                               |  <i>*Vachellia farnesiana</i>  |

Scale: 1:31,300

 0 0.5 1 1.5 Km

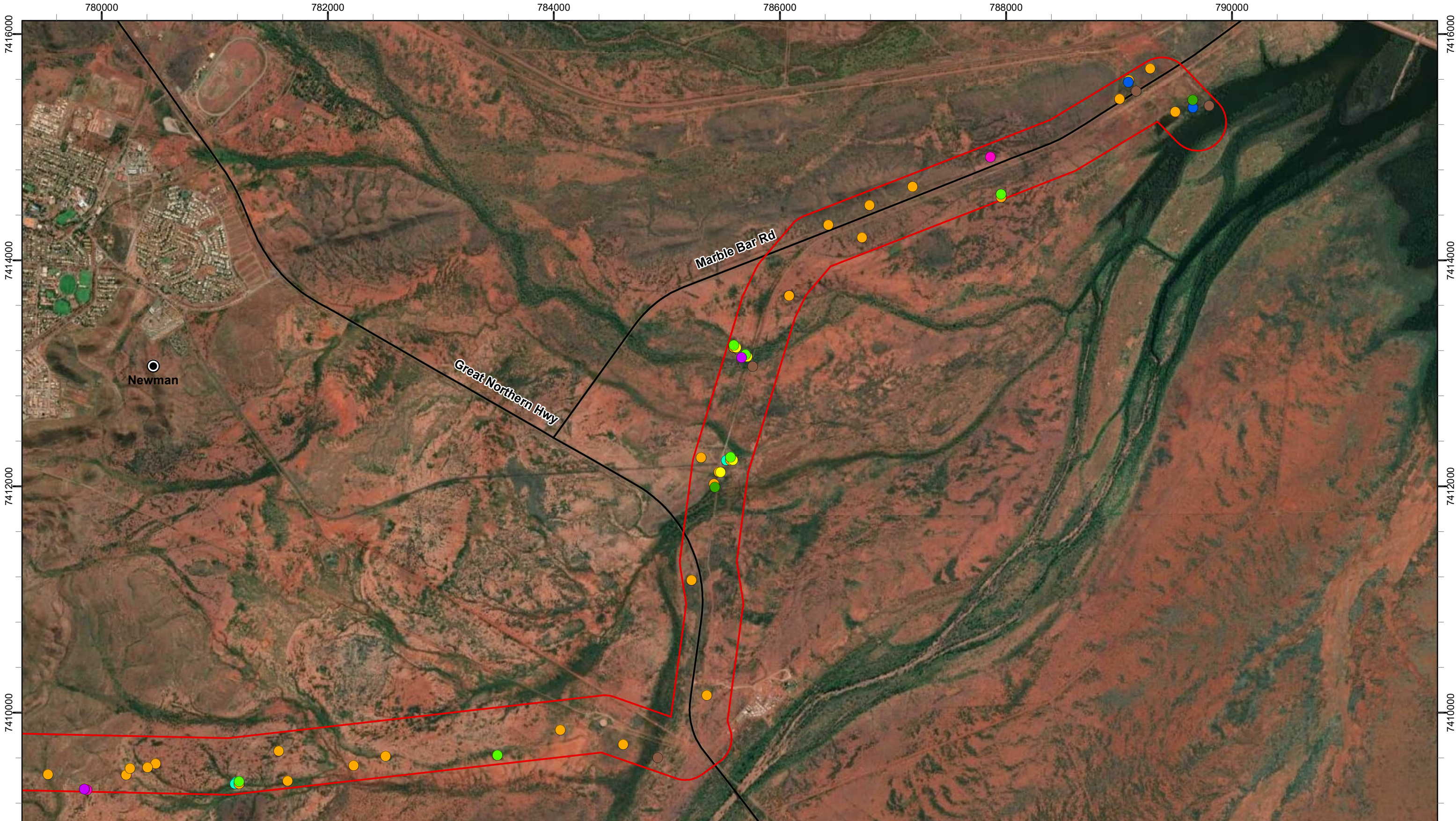
Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994 Created 23/05/2022



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**Figure 3.2d: Introduced flora**  
**recorded in the Survey Area**





**Legend**

Survey Area

State Road

**Taxon**

*\*Aerva javanica*

*\*Bidens bipinnata*

*\*Cenchrus ciliaris*

*\*Cenchrus setiger*

*\*Cynodon dactylon*

*\*Echinochloa colona*

*\*Malvastrum americanum*

*\*Setaria verticillata*

*\*Vachellia farnesiana*

N

biologic

Environmental Survey

0

0.5

1

1.5

Km

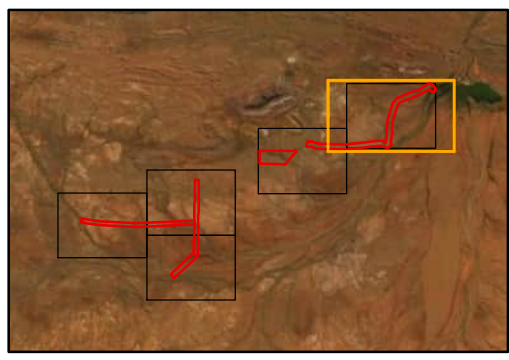
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Coordinate System: GDA 1994 MGA Zone 50

Projection: Transverse Mercator

Datum: GDA 1994

Created 23/05/2022



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**Figure 3.2e: Introduced flora**  
**recorded in the Survey Area**



### 4.2.3 Vegetation

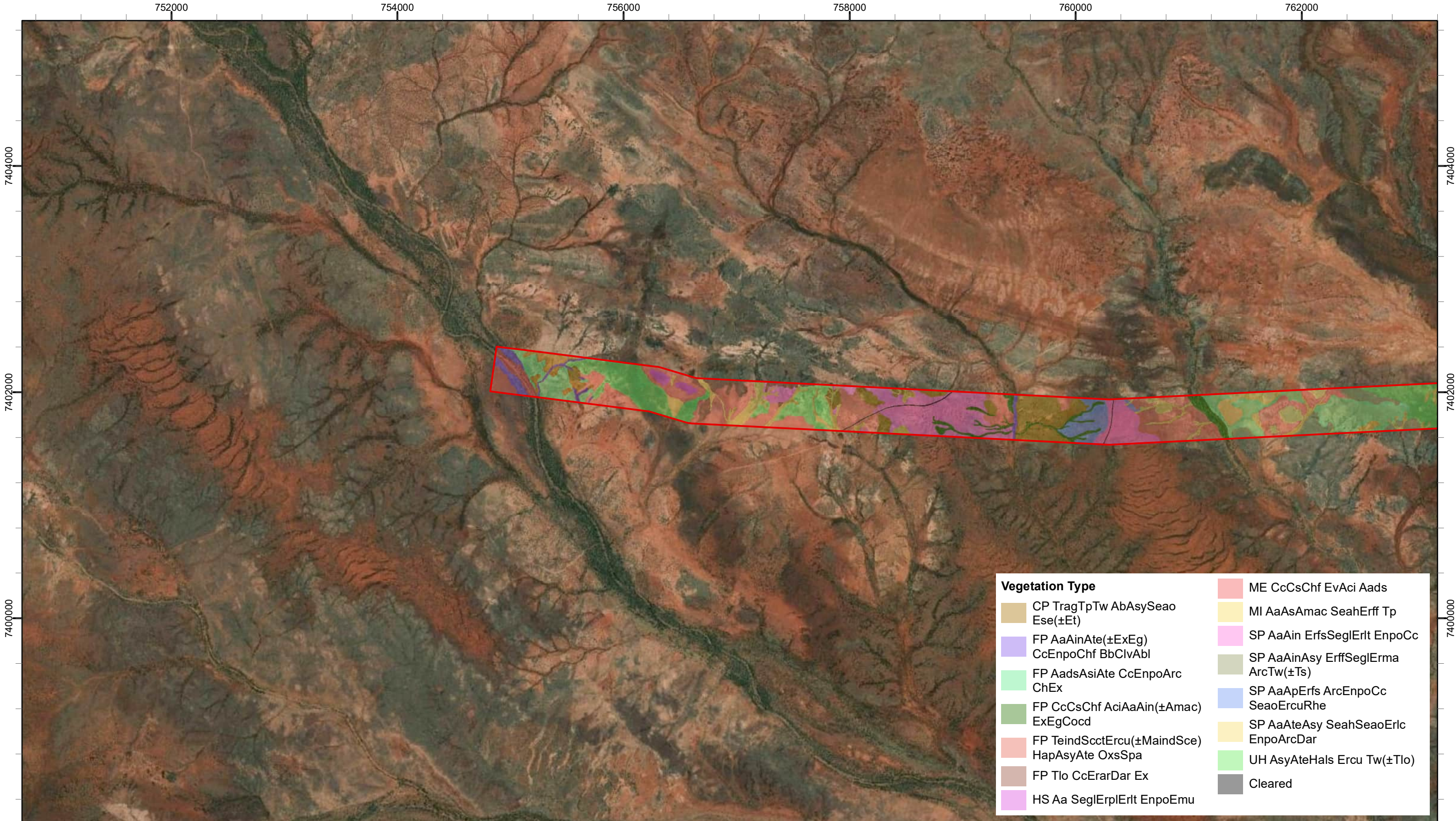
#### *Broad Floristic Formations*

Eighteen broad floristic formations were described from the Survey Area, based on the dominant growth form and land cover genus for the dominant stratum. The broad floristic formations were:

- *Acacia* low open woodland;
- *Acacia* low woodland;
- *Acacia* mid to tall sparse shrubland;
- *Acacia* tall open to sparse shrubland;
- *Acacia* tall shrubland to tall open shrubland;
- *Acacia* tall sparse shrubland;
- *Acacia* tall sparse shrubland to scattered shrubs;
- *Acacia* tall to mid open shrubland;
- *Acacia* tall to mid sparse shrubland;
- \**Cenchrus* mid tussock grassland;
- Chenopod low open to sparse shrubland
- *Eremophila* mid to low sparse shrubland;
- *Eucalyptus* low woodland to low open woodland;
- *Eucalyptus* low open woodland;
- *Senna* mid to low sparse shrubland;
- *Triodia* low hummock grassland;
- *Triodia* mid hummock grassland and;
- *Triodia* mid sparse hummock grassland.



The dominant broad floristic formation (based on extent across the Survey Area) was *Triodia* low hummock grassland which supported five vegetation types (707 ha or 33 %). The *Acacia*-dominated floristic formations (nine) supported a total of 14 vegetation types which together made up approximately 50 % of the Survey Area (1,087 ha). The introduced grass \**Cenchrus ciliaris* dominated one floristic formation, encompassing three vegetation types, though this formation was limited to less than 5 % (104 ha) of the Survey Area. The remainder of the broad floristic formations, which included the other two *Triodia*-dominated floristic formations as well as those dominated by *Eremophila*, *Eucalyptus*, *Senna*, and chenopods, supported one vegetation type each (Figure 4.4 and Table 4.4).



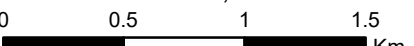


Vegetation Type	
CP TragTpTw AbAsySeao Ese(±Et)	ME CcCsChf EvAci Aads
FP AaAinAte(±ExEg) CcEnpoChf BbClvAbl	MI AaAsAmac SeahErff Tp
FP AadsAsiAte CcEnpoArc ChEx	SP AaAin ErfsSeglErlt EnpoCc
FP CcCsChf AciAaAin(±Amac) ExEgCocd	SP AaAinAsy ErffSeglErma ArcTw(±Ts)
FP TeindScctErcu(±MaindSce) HapAsyAte OxsSpa	SP AaApErfs ArcEnpoCc SeaoErcuRhe
FP Tlo CcErarDar Ex	SP AaAteAsy SeahSeaoErlc EnpoArcDar
HS Aa SeglErplErlt EnpoEmu	UH AsyAteHals Ercu Tw(±Tlo)
	Cleared

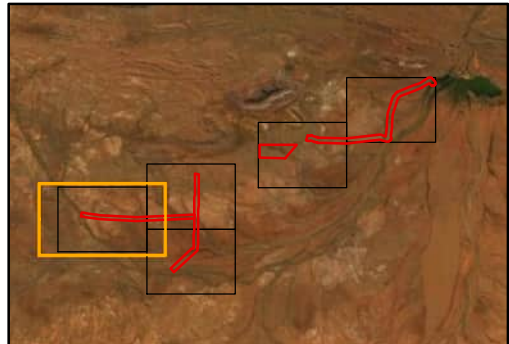
**Legend**  
 Survey Area



Scale: 1:31,300

  
0 0.5 1 1.5 Km

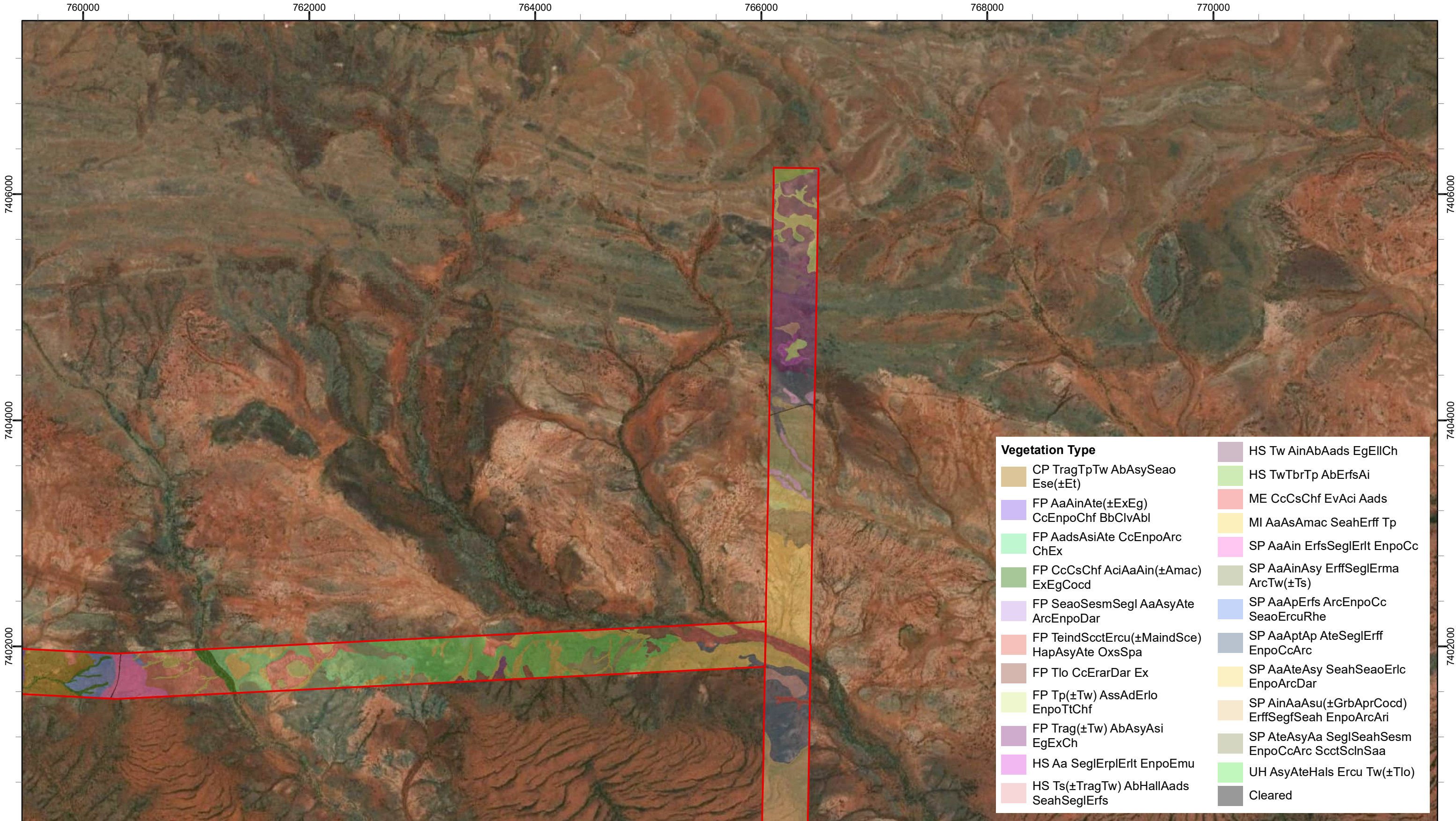
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Datum: GDA 1994 Created 08/06/2022




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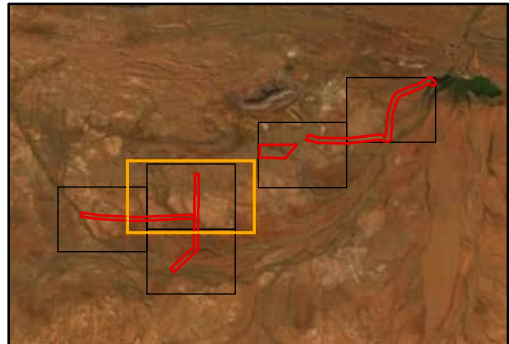
**Figure 4.4a: Vegetation types**  
**recorded in the Survey Area**





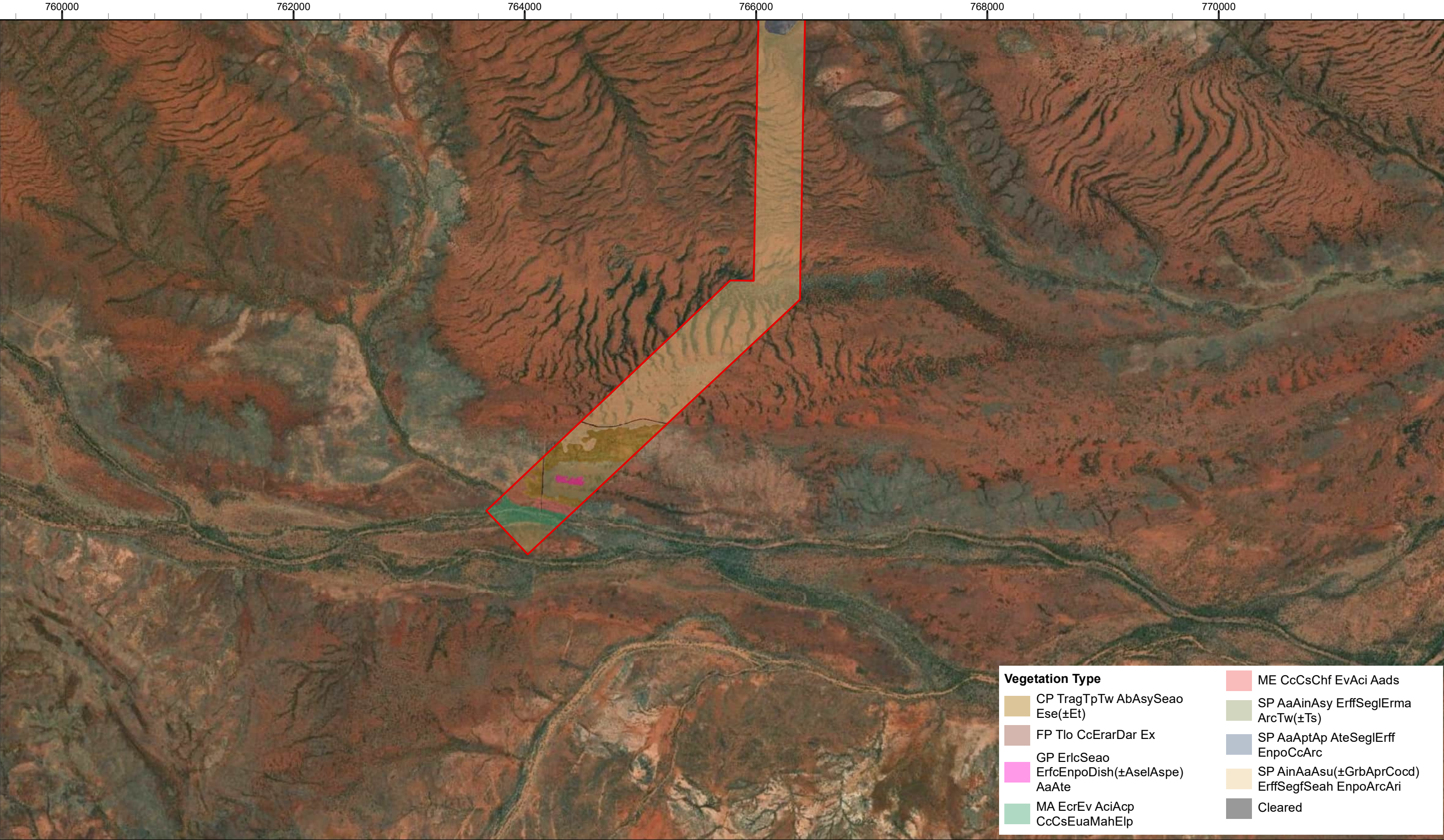
**Legend**  
Survey Area

  
Scale: 1:31,300  
0 0.5 1 1.5 Km  
Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994 Created 08/06/2022



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**Figure 4.4b: Vegetation types**  
**recorded in the Survey Area**





Vegetation Type	
CP TragTpTw AbAsySeao Ese(±Et)	ME CcCsChf EvAci Aads
FP Tlo CcErarDar Ex	SP AaAinAsy ErffSeglErma ArcTw(±Ts)
GP ErlcSeao	SP AaAptAp AteSeglErff EnpoCcArc
ErfcEnpoDish(±AselAspe) AaAte	SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri
MA EcrEv AciAcp CcCsEuaMahElp	Cleared

**Legend**  

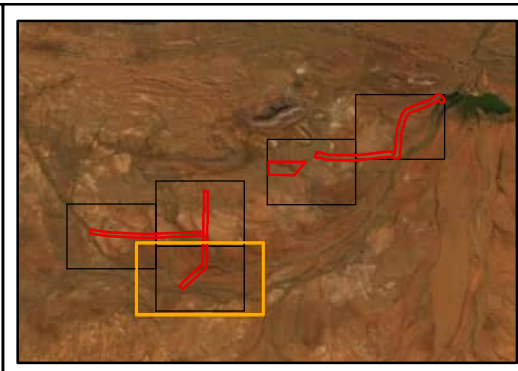
Survey Area

N

biologic  
Environmental Survey

Scale: 1:31,300  
0 0.5 1 1.5 Km

Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994 Created 08/06/2022



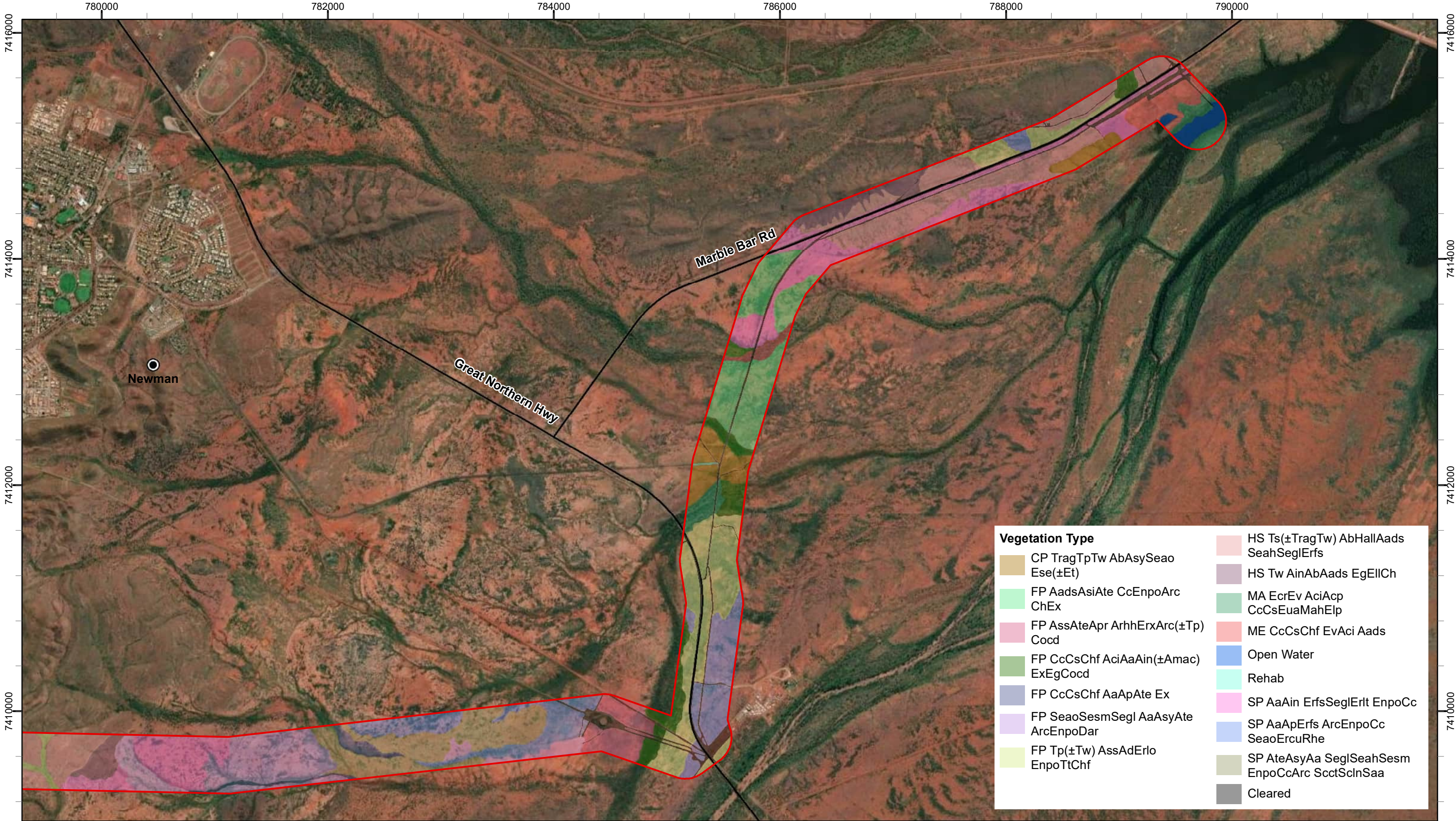
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Vegetation Survey**

**Figure 4.4c: Vegetation types  
recorded in the Survey Area**










**Legend**

Survey Area

State Road

N

**biologic**  
Environmental Survey



Scale: 1:31,300

0

0.5

1

1.5

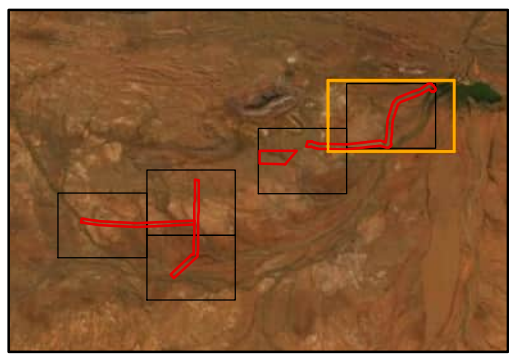
Km

Coordinate System: GDA 1994 MGA Zone 50

Projection: Transverse Mercator

Datum: GDA 1994

Created 08/06/2022



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Vegetation Survey**

**Figure 4.4e: Vegetation types  
recorded in the Survey Area**



## Vegetation Types




A total of 29 vegetation types were described and delineated from the Survey Area (Figure 4.4, Table 4.4). The vegetation types were located across nine landforms;

- stony plain;
- drainage area/ floodplain;
- hillcrest/ upper hillslope;
- hillslope and undulating low hill;
- calcrete plain;
- major drainage line;
- medium drainage line;
- minor drainage line and;
- gilgai plain.




The dominant landform across the Survey Area was stony plains (677 ha / 31 %) followed by drainage area/ floodplain (667 ha / 31 %). Three mapping units were delineated from the Survey Area; 'Cleared', 'Open Water' and 'Rehab'. 'Cleared' consisted of roads, tracks, and buildings/ infrastructure. 'Open Water' was mapped in the northeast of the Survey Area in line with where the Fortescue River discharges into Ophthalmia Dam. Small patches of rehabilitation were observed in association with the Mt Whaleback mine site and old tracks and were mapped as 'Rehab'. A total of 97 % of the Survey Area was comprised of native vegetation, including all vegetation types and the 'Rehab' mapping unit.






**Table 4.4: Vegetation type descriptions**

Code	Description	Sample Sites	Extent (ha / %)	Significant Features	Condition	Photo
Acacia low open woodland						
FP AaAinAte(±ExEg) CcEnpoChf BbClvAbl	Low open woodland of <i>Acacia aptaneura</i> , <i>Acacia incurvaneura</i> , and <i>Acacia tetragonophylla</i> (± <i>Eucalyptus xerothermica</i> , <i>Eucalyptus gamophylla</i> ) over low open tussock grassland of * <i>Cenchrus ciliaris</i> , <i>Enneapogon polyphyllus</i> , <i>Chrysopogon fallax</i> with low scattered herbs of * <i>Bidens bipinnata</i> , <i>Arivela viscosa</i> , <i>Abutilon lepidum</i> on brown clay loam on drainage areas/ floodplains and minor drainage lines.	Relevés: WRP-013, WRP-114, WRP-115, WRP-116, WRP-119, WRP-120, WRP-127, WRP-129, PDP-030, PDP-035. Mapping Notes: PDM-07.	52.4 / 2.4	<ul style="list-style-type: none"> <li>• Nil</li> </ul>	Very Good to Poor	
SP AaAptAp AteSeglErff EnpoCcArc	Low open woodland of <i>Acacia aptaneura</i> , <i>Acacia pteraneura</i> , and <i>Acacia pruinocarpa</i> over mid sparse shrubland to scattered shrubs of <i>Acacia tetragonophylla</i> , <i>Senna glutinosa</i> subsp. <i>×luerissenii</i> , and <i>Eremophila forrestii</i> subsp. <i>forrestii</i> over low sparse tussock grassland of <i>Enneapogon polyphyllus</i> , * <i>Cenchrus ciliaris</i> , and <i>Aristida contorta</i> on brown silty clay loam on stony plain.	Relevés: WRP-054, WRP-055, WRP-057, WRP-071, WRP-072, WRP-073. Mapping Notes: CVM14	39.5 / 1.8	<ul style="list-style-type: none"> <li>• Nil</li> </ul>	Very Good to Degraded	
Acacia low woodland						
SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri	Low woodland of <i>Acacia incurvaneura</i> , <i>Acacia aptaneura</i> , <i>Acacia subcontorta</i> (± <i>Grevillea berryana</i> , <i>Acacia pruinocarpa</i> , and <i>Corymbia candida</i> subsp. <i>dipsodes</i> ) over mid scattered shrubs of <i>Eremophila forrestii</i> subsp. <i>forrestii</i> , <i>Senna glaucifolia</i> , and <i>Senna artemisioides</i> subsp. <i>helmsii</i> over low scattered tussock grasses to isolated patches of <i>Enneapogon polyphyllus</i> , <i>Aristida contorta</i> , and <i>Aristida inaequiglumis</i> on brown clay loam on hardpans and stony plains.	Relevés: WRP-074, WRP-075, WRP-076, WRP-077, WRP-078, WRP-079, WRP-080, WRP-081, WRP-082, WRP-083, WRP-084, WRP-085, WRP-086.	188.7 / 8.7	<ul style="list-style-type: none"> <li>• Sheet-flow dependent ecosystem</li> <li>• 59-point locations totaling 66 individuals of <i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794) (P3)</li> </ul>	Good	






Code	Description	Sample Sites	Extent (ha / %)	Significant Features	Condition	Photo
Acacia mid to tall sparse shrubland						
SP AaAteAsy SeahSeaoErlc EnpoArcDar	Mid to tall sparse shrubland of <i>Acacia aptaneura</i> , <i>Acacia tetragonophylla</i> , and <i>Acacia synchronicia</i> over low sparse shrubland to scattered shrubs of <i>Senna artemisioides</i> subsp. <i>helmsii</i> , <i>Senna artemisioides</i> subsp. <i>oligophylla</i> , and <i>Eremophila lachnocalyx</i> over low scattered tussock grasses to isolated patches of tussock grasses of <i>Enneapogon polyphyllus</i> , <i>Aristida contorta</i> , and <i>Dactyloctenium radulans</i> on brown clay loam on stony plains.	Relevés: WRP-062, WRP-065, WRP-066, WRP-067, WRP-068, PDP-11, PDP-17, PDP-20, PDP-21 Mapping Notes: PDM-002, PDM-010.	78.5 / 3.6	<ul style="list-style-type: none"><li>• Nil</li></ul>	Excellent to Good	
SP AaApErf ArcEnpoCc SeaoErcuRhe	Mid to tall sparse shrubland to isolated patches of shrubs of <i>Acacia aptaneura</i> , <i>Acacia paraneura</i> , and <i>Eremophila fraseri</i> subsp. <i>fraseri</i> over low sparse tussock grassland of <i>Aristida contorta</i> , <i>Enneapogon polyphyllus</i> , and * <i>Cenchrus ciliaris</i> with low scattered shrubs of <i>Senna artemisioides</i> subsp. <i>oligophylla</i> , <i>Eremophila cuneifolia</i> , and <i>Rhagodia eremaea</i> on brown clay loam on stony plains.	Relevés: WRP-033, WRP-037, WRP-039. Mapping Notes: CVM08.	88.0 / 4.1	<ul style="list-style-type: none"><li>• Nil</li></ul>	Excellent to Poor	
Acacia tall open to sparse shrubland						
HS Aa SeglErpIErlt EnpoEmu	Tall open to sparse shrubland of <i>Acacia aptaneura</i> over mid sparse shrubland of <i>Senna glutinosa</i> subsp. <i>xluerssenii</i> , <i>Eremophila ?platycalyx</i> , and <i>Eremophila latrobei</i> over low scattered tussock grasses of <i>Enneapogon polyphyllus</i> , and <i>Eriachne mucronata</i> on brown silty loam on hillslopes and upper hillslopes/hillcrests.	Relevés: WRP-010, WRP-012, WRP-052, PDP-037. Mapping Notes: CVM30	5.7 / 0.3	<ul style="list-style-type: none"><li>• Nil</li></ul>	Excellent	






Code	Description	Sample Sites	Extent (ha / %)	Significant Features	Condition	Photo
Acacia tall shrubland to tall open shrubland						
FP AaApAte SeglMam EnpoEmuAri Tp	Tall shrubland to tall open shrubland of <i>Acacia aptaneura</i> , <i>Acacia paraneura</i> and <i>Acacia tetragonophylla</i> over mid to low scattered shrubs of <i>Senna glutinosa</i> subsp. <i>xluerssenii</i> , and <i>Maireana melanocoma</i> over low scattered, tussock and hummock grasses of <i>Enneapogon polyphyllus</i> , <i>Eriachne mucronata</i> , <i>Aristida inaequiglumis</i> and <i>Triodia pungens</i> on brown clay loam on stony plains and drainage areas/ floodplains.	Relevés: WRP-015, WRP-101, WRP-103, WRP-107. Mapping Notes: CVM24.	60.9 / 2.8	<ul style="list-style-type: none"><li>• Nil</li></ul>	Excellent to Very Good	
Acacia tall sparse shrubland						
SP AaAin ErfsSeglErlt EnpoCc	Tall sparse shrubland of <i>Acacia aptaneura</i> , and <i>Acacia incurvaneura</i> over mid scattered shrubs of <i>Eremophila fraseri</i> subsp. <i>fraseri</i> , <i>Senna glutinosa</i> subsp. <i>xluerssenii</i> and <i>Eremophila latrobei</i> over low scattered tussock grasses of <i>Enneapogon polyphyllus</i> , and * <i>Cenchrus ciliaris</i> on brown silty clay loam on stony plains.	Relevés: WRP-019, WRP-094, WRP-096, PDP-028, PDP-031. Mapping Notes: PDM-12.	144.8 / 6.7	<ul style="list-style-type: none"><li>• Nil</li></ul>	Excellent to Poor	
SP AaAinAsy ErffSeglErma ArcTw(±Ts)	Tall sparse shrubland of <i>Acacia aptaneura</i> , <i>Acacia incurvaneura</i> , and <i>Acacia synchronicia</i> over mid to low scattered shrubs of <i>Eremophila forrestii</i> subsp. <i>forrestii</i> , <i>Senna glutinosa</i> subsp. <i>xluerssenii</i> , and <i>Eremophila ?margarethae</i> over low scattered tussock grasses of <i>Aristida contorta</i> with isolated patches of low hummock grasses of <i>Triodia wiseana</i> (± <i>Triodia vanleeuwenii</i> ) on brown silty clay loam on stony plains.	Relevés: WRP-088, WRP-089, PDP-013, PDP-022, PDP-025.	41.6 / 1.9	<ul style="list-style-type: none"><li>• Nil</li></ul>	Excellent to Good	



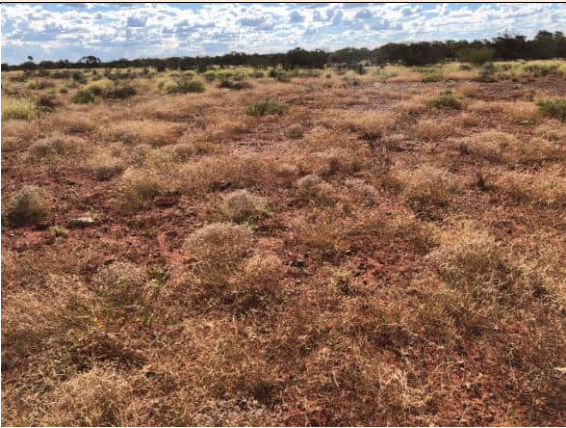


Code	Description	Sample Sites	Extent (ha / %)	Significant Features	Condition	Photo
Acacia tall sparse shrubland to scattered shrubs						
SP AteAsyAa SeglSeahSesm EnpoCcArc ScctScInSaa	Tall sparse shrubland to scattered shrubs of <i>Acacia tetragonophylla</i> , <i>Acacia synchronicia</i> , and <i>Acacia aptaneura</i> over mid scattered shrubs of <i>Senna glutinosa</i> subsp. <i>xluerssenii</i> , <i>Senna artemisioides</i> subsp. <i>helmsii</i> , and <i>Senna</i> sp. Meekatharra (E. Bailey 1-36) over low scattered tussock grasses of <i>Enneapogon polyphyllus</i> , <i>*Cenchrus ciliaris</i> , and <i>Aristida contorta</i> with low scattered chenopod shrubs of on brown clay loam on stony plains.	Relevés: WRP-038, WRP-040, WRP-056, WRP-058, WRP-060, WRP-063, WRP-064	95.7 / 4.4	<ul style="list-style-type: none"><li>• Nil</li></ul>	Excellent to Poor	
Acacia tall to mid open shrubland						
FP AadsAsiAte CcEnpoArc ChEx	Tall to mid open shrubland of <i>Acacia ?adsurgens</i> , <i>Acacia sibirica</i> , and <i>Acacia tetragonophylla</i> over low open tussock grassland of <i>*Cenchrus ciliaris</i> , <i>Enneapogon polyphyllus</i> , and <i>Aristida contorta</i> with low scattered trees of <i>Corymbia hamersleyensis</i> , and <i>Eucalyptus xerothermica</i> on brown clay loam on drainage areas/ floodplains.	Relevés: WRP-025, WRP-109, WRP-121, WRP-123, PDP-024.	136.9 / 6.3	<ul style="list-style-type: none"><li>• Nil</li></ul>	Very Good to Degraded	
UH AsyAteHals Ercu Tw(±Tlo)	Mid to low open shrubland of <i>Acacia synchronicia</i> , <i>Acacia tetragonophylla</i> and <i>Hakea leucoptera</i> subsp. <i>sericipes</i> over low open shrubland of <i>Eremophila cuneifolia</i> over open hummock grassland of <i>Triodia wiseana</i> (± <i>Triodia longiceps</i> ) on quartz stony plain on undulating low hills	Relevés: PDP-003, PDP-027, PDP-036	89.9 / 4.2	<ul style="list-style-type: none"><li>• Nil</li></ul>	Very Good to Good	






Code	Description	Sample Sites	Extent (ha / %)	Significant Features	Condition	Photo
Acacia tall to mid sparse shrubland						
FP AssAteApr ArhhErxCocd	Tall to mid sparse shrubland of <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> , <i>Acacia tetragonophylla</i> , and <i>Acacia pruinocarpa</i> over low open tussock grassland of <i>Aristida holathera</i> var. <i>holathera</i> , <i>Eragrostis xerophila</i> , <i>Aristida contorta</i> ± low scattered hummock grasses of <i>Triodia pungens</i> with low scattered trees of <i>Corymbia candida</i> subsp. <i>dipsodes</i> on loamy sand on drainage areas/ floodplains.	Relevés: WRP-035	21.4 / 1.0	• Nil	Very Good to Good	
MI AaAsAmac SeahErff Tp	Tall shrubland to sparse shrubland of <i>Acacia aptaneura</i> , <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and <i>Acacia macraneura</i> over mid to low open shrubland of <i>Senna artemisioides</i> subsp. <i>helmsii</i> , <i>Eremophila forrestii</i> subsp. <i>forrestii</i> with open hummock grassland of <i>Triodia pungens</i> on red sandy clay on minor drainage areas	Relevés: PDP-006, PDP-010, PDP-015. Mapping Notes: PDM-11.	43.1 / 2.0	• Nil	Very Good to Poor	
*Cenchrus mid tussock grassland						
FP CcCsChf AciAaAin(±Amac) ExEgCocd	Mid tussock grassland of <i>*Cenchrus ciliaris</i> , <i>*Cenchrus setiger</i> , and <i>Chrysopogon fallax</i> with tall open shrubland of <i>Acacia citrinoviridis</i> , <i>Acacia aptaneura</i> , and <i>Acacia incurvaneura</i> (± <i>Acacia macraneura</i> ) with low open woodland of <i>Eucalyptus xerothermica</i> , <i>Eucalyptus gamophylla</i> , and <i>Corymbia candida</i> subsp. <i>dipsodes</i> on brown clay loam on drainage areas/ floodplains.	Relevés: WRP-018, WRP-022, WRP-027, WRP-035, WRP-097, WRP-099, PDP-019, PDP-033.	50.2 / 2.3	• Nil	Good to Degraded	



Code	Description	Sample Sites	Extent (ha / %)	Significant Features	Condition	Photo
FP CcCsChf AaApAte Ex	Mid tussock grassland of <i>*Cenchrus ciliaris</i> , <i>*Cenchrus setiger</i> , and <i>Chrysopogon fallax</i> with tall sparse shrubland to scattered trees of <i>Acacia aptaneura</i> , <i>Acacia paraneura</i> , and <i>Acacia tetragonophylla</i> with low scattered trees of <i>Eucalyptus xerothermica</i> on brown clay loam on drainage areas/ floodplains and minor drainage lines.	Relevés: WRP-016, WRP-041, WRP-105. Mapping Notes: CVM23.	12.5 / 0.6	<ul style="list-style-type: none"><li>• Nil</li></ul>	Poor to Degraded	
ME CcCsChf EvAci Aads	Mid tussock grassland of <i>*Cenchrus ciliaris</i> , <i>*Cenchrus setiger</i> and <i>Chrysopogon fallax</i> with low to mid open woodland of <i>Eucalyptus victrix</i> and <i>Acacia citrinoviridis</i> over tall scattered shrubs of <i>Acacia ?adsurgens</i> on brown clay loam on medium drainage lines.	Relevés: WRP-002, WRP-029, WRP-069, PDP-016, PDP-039.	41.4 / 1.9	<ul style="list-style-type: none"><li>• Groundwater Dependent Vegetation</li><li>• Water feature</li><li>• 56 individuals of <i>Ipomoea racemigera</i> (P2) from six-point locations</li></ul>	Very Good to Degraded	
<i>Eremophila</i> mid to low sparse shrubland						
GP ErcSeao ErftEnpoDish(±AselAspe) AaAte	Mid to low sparse shrubland of <i>Eremophila lachnocalyx</i> , and <i>Senna artemisioides</i> subsp. <i>oligophylla</i> over low sparse tussock grassland of <i>Eriachne flaccida</i> , <i>Enneapogon polyphyllus</i> , and <i>Dichanthium sericeum</i> subsp. <i>humilius</i> (± <i>Astrebla elymoides</i> , <i>Astrebla pectinata</i> ) with tall scattered shrubs of <i>Acacia aptaneura</i> , and <i>Acacia tetragonophylla</i> on brown clay loam on cracking clays and gilgai plains.	Relevés: WRP-087, WRP-102. Mapping Notes: CVM26.	5.7 / 0.3	<ul style="list-style-type: none"><li>• Cracking clay / gilgai plains</li></ul>	Very Good to Degraded	






Code	Description	Sample Sites	Extent (ha / %)	Significant Features	Condition	Photo
Eucalyptus low open woodland						
FP EgCh TtCcPamu AdSalPI	Low open woodland of <i>Eucalyptus gamophylla</i> , and <i>Corymbia hamersleyana</i> over mid to low open tussock grassland of <i>Themeda triandra</i> , * <i>Cenchrus ciliaris</i> , and <i>Paraneurachne muelleri</i> with tall scattered shrubs of <i>Acacia dictyophleba</i> , <i>Santalum lanceolatum</i> , and <i>Petalostylis labicheoides</i> on brown loamy sand on drainage areas/ floodplains.	Relevés: WRP-005, WRP-006. Mapping Notes: CVM01, CVM05.	2.0 / 0.1	<ul style="list-style-type: none"><li>• Nil</li></ul>	Very Good	
Eucalyptus low woodland to low open woodland						
MA EcrEv AciAcp CcCsEuaMahElp	Low woodland to low open woodland of <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i> and occasional <i>Eucalyptus victrix</i> tall sparse shrubland of <i>Acacia citrinoviridis</i> and <i>Acacia coriacea</i> subsp. <i>pendens</i> over mid open tussock grassland of * <i>Cenchrus ciliaris</i> , * <i>Cenchrus setiger</i> and <i>Eulalia aurea</i> with low sparse herbland/ sedgeland of <i>Marsilea hirsuta</i> and <i>Eleocharis pallens</i> on brown medium clay on major and medium drainage lines.	Relevés: WRP-001, WRP-032, WRP-090. Mapping Notes: CVM15.	25.8 / 1.2	<ul style="list-style-type: none"><li>• Groundwater Dependent Vegetation</li><li>• Gingianna Pool</li></ul>	Good to Poor	
Senna mid to low sparse shrubland						
FP SeaoSesmSegl AaAsyAte ArcEnpoDar	Mid to low sparse shrubland of <i>Senna artemisioides</i> subsp. <i>oligophylla</i> , <i>Senna</i> sp. Meekatharra (E. Bailey 1-36), and <i>Senna glutinosa</i> subsp. <i>xluerssenii</i> with tall scattered shrubs of <i>Acacia aptaneura</i> , <i>Acacia synchronicia</i> , and <i>Acacia tetragonophylla</i> over low scattered tussock grasses of <i>Aristida contorta</i> , <i>Enneapogon polyphyllus</i> , and <i>Dactyloctenium radulans</i> on brown clay loam on drainage areas/ floodplain.	Relevés: WRP-042, WRP-059, WRP-095, WRP-130. Mapping Notes: Mvw01, CVM11, CVM12, CVM13.	74.0 / 3.4	<ul style="list-style-type: none"><li>• Nil</li></ul>	Very Good to Degraded	






Code	Description	Sample Sites	Extent (ha / %)	Significant Features	Condition	Photo
Triodia low hummock grassland						
CP TragTpTw AbAsySeao Ese(±Et)	Low hummock grassland of <i>Triodia angusta</i> , <i>Triodia pungens</i> , and <i>Triodia wiseana</i> with mid to tall sparse shrubland to scattered shrubs of <i>Acacia bivenosa</i> (wispy form), <i>Acacia synchronicia</i> , and <i>Senna artemisioides</i> subsp. <i>oligophylla</i> with low scattered tree of <i>Eucalyptus socialis</i> subsp. <i>eucentrica</i> (± <i>Eucalyptus trivalva</i> ) on red-brown clay loam on calcrete stony plains and platforms.	Relevés: WRP-003, WRP-030, WRP-031, WRP-092, WRP-128, PDP-001, PDP-007, PDP-009, PDP-032. Mapping Notes: CVM16, CVM28, CVM29, PDM-13.	108.6 / 5.0	<ul style="list-style-type: none"><li>• Nil</li></ul>	Excellent to Degraded	
FP Trag(±Tw) AbAsyAsi EgExCh	Low hummock grassland of <i>Triodia angusta</i> , ± <i>Triodia wiseana</i> with mid to low scattered shrubs of <i>Acacia bivenosa</i> , <i>Acacia synchronicia</i> , and <i>Acacia sibirica</i> with occasional low scattered trees of <i>Eucalyptus gamophylla</i> , <i>Eucalyptus xerothermica</i> , and <i>Corymbia hamersleyana</i> on brown clay loam on low slopes, drainage areas/ floodplains and undulating hills.	Relevés: WRP-008, WRP-048, WRP-049, WRP-110, WRP-111, PDP-029. Mapping Notes: CVM03, CVM20, CVM31.	52.0 / 2.4	<ul style="list-style-type: none"><li>• Nil</li></ul>	Excellent to Very Good	
FP Tp(±Tw) AssAdErlo EnpoTtChf	Low hummock grassland of <i>Triodia pungens</i> , ± <i>Triodia wiseana</i> with mid to tall sparse shrubland of <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> , <i>Acacia dictyophleba</i> , and <i>Eremophila longifolia</i> over mid to low sparse tussock grassland of <i>Enneapogon polyphyllus</i> , <i>Themeda triandra</i> , and <i>Chrysopogon fallax</i> on brown silty clay loam on drainage areas/ floodplains and minor drainage lines.	Relevés: WRP-007, WRP-021, WRP-034, WRP-043, WRP-044, WRP-046, WRP-053, WRP-061, WRP-093, WRP-112. Mapping Notes: CVM06, CVM07, CVM34.	104.3 / 4.8	<ul style="list-style-type: none"><li>• Nil</li></ul>	Excellent to Poor	



Code	Description	Sample Sites	Extent (ha / %)	Significant Features	Condition	Photo
HS Ts(±TragTw) AbHallAads SeahSeglErfs	Low hummock grassland of <i>Triodia vanleeuwenii</i> ± <i>Triodia angusta</i> , and <i>Triodia wiseana</i> with mid to tall sparse shrubland to scattered shrubs of <i>Acacia bivenosa</i> , <i>Hakea lorea</i> subsp. <i>lorea</i> , and <i>Acacia adsurgens</i> over low scattered shrubs of <i>Senna artemisioides</i> subsp. <i>helmsii</i> , <i>Senna glutinosa</i> subsp. <i>xluerssenii</i> , and <i>Eremophila fraseri</i> subsp. <i>fraseri</i> on brown silty loam on undulating low hills.	Relevés: WRP-004, WRP-011, WRP-020, WRP-023, WRP-024, WRP-026, WRP-051, WRP-070, WRP-108, WRP-117. Mapping Notes: CVM10, CVM18, CVM32.	157.1 / 7.2	<ul style="list-style-type: none"><li>• Nil</li></ul>	Excellent to Good	
HS Tw AinAbAads EgElICh	Low hummock grassland of <i>Triodia wiseana</i> with mid to tall sparse shrubland to scattered shrubs of <i>Acacia inaequilatera</i> , <i>Acacia bivenosa</i> , and <i>Acacia adsurgens</i> with low scattered trees of <i>Eucalyptus gamophylla</i> , <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> , and <i>Corymbia hamersleyana</i> on brown silty loam on undulating hills and lower slopes.	Relevés: WRP-009, WRP-014, WRP-017, WRP-028, WRP-045, WRP-047, WRP-050, WRP-098, WRP-100, WRP-104, WRP-106, WRP-113, WRP-118, WRP-122, WRP-124, WRP-125, WRP126. Mapping Notes: CVM02, CVM04, CVM09, CM17, CVM19, CVM21, CVM25, CVM33, CVM34.	284.7 / 113.1	<ul style="list-style-type: none"><li>• Nil</li></ul>	Excellent to Good	
Triodia mid hummock grassland						
HS TwTbrTp AbErfsAi	Mid hummock grassland of <i>Triodia wiseana</i> , <i>Triodia brizoides</i> and <i>Triodia pungens</i> with mid to tall open shrubland <i>Acacia bivenosa</i> , <i>Eremophila fraseri</i> subsp. <i>fraseri</i> and <i>Acacia inaequilatera</i> on red silty loam on hillslopes, hillcrest/ upper hillslopes and undulating low hills.	Relevés: CBW-21, WRI-09, WRI-12, WRI-13, WRI-83, WRI-84. Sampled as part of Biologic (2020b).	3.1 / 0.1	<ul style="list-style-type: none"><li>• Nil</li></ul>	Excellent	



Code	Description	Sample Sites	Extent (ha / %)	Significant Features	Condition	Photo
Triodia mid sparse hummock grassland						
FP Tlo CcErarDar Ex	Mid sparse hummock grassland of <i>Triodia longiceps</i> over low sparse tussock grassland of <i>*Cenchrus ciliaris</i> , <i>Eriachne aristidea</i> and <i>Dactyloctenium radulans</i> with low scattered trees of <i>Eucalyptus xerothermica</i> on brown clay loam on drainage areas/ floodplain.	Relevés: WRP-091, PDP-005, PDP-012, PDP-014.	19.7 / 0.9	<ul style="list-style-type: none"><li>Nil</li></ul>	Very Good to Poor	
Chenopod low open to sparse shrubland						
FP TeindScctErcu(±MaindSce) HapAsyAte OxsSpa	Low open to sparse shrubland of <i>Tecticornia</i> sp. indet, <i>Sclerolaena cuneata</i> and <i>Eremophila cuneifolia</i> (± <i>Maireana</i> sp. indet 2 and <i>Sclerolaena ?eriacantha</i> ) with mid scattered shrubs of <i>Hakea preissii</i> , <i>Acacia synchronicia</i> and <i>Acacia tetragonophylla</i> over scattered tussock grass of <i>Oxychloris scariosa</i> and <i>Sporobolus actinocladus</i> on quartz stony plain on drainage areas/floodplain.	Relevés: PDP-002, PDP-004, PDP-008, PDP-018, PDP-023, PDP-026, PDP-034, PDP-038. Mapping Notes: PDM-01, PDM-04	80.8 / 3.7	<ul style="list-style-type: none"><li>Nil</li></ul>	Excellent to Good	
Mapping Units						
Cleared	Cleared	-	51.4 / 2.4	-	Cleared	
Open Water	Open Water	-	8.5 / 0.4	-		-
Rehab	Rehab	-	0.4 / 0.02	-		-
Totals			2,169.4 / 100.0			



#### 4.2.4 Significant Vegetation

##### Federal and State Listed Vegetation

The desktop assessment (Section 4.1.2) identified one vegetation-relevant State-listed PEC as being within 40 km of the Survey Area. The 'Vegetation of sand dunes of the Hamersley Range/Fortescue Valley (previously Fortescue Valley Sand Dunes)' (Priority 3) PEC is associated with sand dunes of the Hamersley Ranges and Fortescue Valley, with the closest occurrence being more than 37 km north. Vegetation types within the Survey Area did not contain any key characteristics that define or are representative of the PEC (such as sand dunes, or associated dune vegetation or associated species). Therefore, this PEC is not considered to occur within the Study Area.

Vegetation type GP ErcSeao ErcEnpoDish( $\pm$ AselAspe) AaAte shares affinities with Priority one PEC, 'West-Angelas Cracking-Clays'. This PEC is described as open tussock grasslands of *Astrebla pectinata*, *Astrebla elymoides*, *Aristida latifolia*, in combination with low scattered shrubs of *Sida fibulifera*, on basalt (Jerrinah formation) derived cracking-clay loam depressions and flowlines. It occurs throughout the central and eastern Hamersley Range from near Tom Price east to Newman (DBCA, 2020). Vegetation type GP ErcSeao ErcEnpoDish( $\pm$ AselAspe) AaAte occurred on cracking clay and contained key species associated with the PEC (Figure 4.5). These were *Astrebla elymoides*, *Astrebla pectinata*, and *Sida fibulifera*. *Astrebla elymoides* was present in sample site WRP-087 and *Astrebla pectinata* was present in sample site WRP-102 but neither species form a dominant part of the grassland stratum at these relevés. *Astrebla* was observed again at mapping note CVM-26 (Plate 4.3). *Sida fibulifera* was found in both relevés but did not form a major part of the vegetation structure. The mapped vegetation type contained additional strata (mid to low sparse shrubland, and tall scattered shrubs) and species (*Eremophila lachnocalyx*, *Senna artemisioides* subsp. *oligophylla*, *Acacia aptaneura* and *Acacia tetragonophylla*) that are not typical for the 'West-Angelas Cracking-Clays' PEC. Considering the above, the cracking-clay vegetation type found within the Survey Area is not considered to represent this PEC.

None of the other vegetation types described and delineated from the Survey Area are considered to be analogous with any TECs and PECs known to occur in the Pilbara region.



Plate 4.3: Mapping note CVM-26 (L) and *Astrebla pectinata* at relevé WRP-102 (R)



## Vegetation of Other Significance

The EPA (2016b) advises that vegetation may be of significance for reasons other than a listing as a TEC or a PEC. This may include, although is not limited to, scarcity, novel combination of species, role as a refuge, restricted distribution and vegetation extent being below a threshold level.

Vegetation type SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri in the southwest portion of the Survey Area supported the Priority 3 plant *Rhagodia* sp. Hamersley (M. Trudgen 17794). It is therefore locally significant in providing suitable habitat for this species. This vegetation type also supports sheet-flow dependent vegetation, which is discussed further below. This vegetation type comprises 8.7 % of the Survey Area (188.7 ha).

Five vegetation types within the Survey Area are analogous with several 'ecosystems at risk'<sup>1</sup> for the Hamersley IBRA subregion (Kendrick, 2001) (Table 4.5). Vegetation type SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri displays mulga groving and is analogous with 'Grove/ inter-grove mulga of the eastern Hamersley Range'. Vegetation types containing mulga species as dominant components (*Acacia aptaneura*, *Acacia incurvaneura*, *Acacia paraneura* and *Acacia pteraneura*) of either woodland, open woodland, or shrubland can be considered 'valley floor mulga'. Mulga present as open to sparse shrubland, or as scattered shrubs was not classed 'at risk'. There were no eligible mulga vegetation types present on lower slopes ('lower-slope mulga'). All major ephemeral water courses are described as being at risk by Kendrick (2001) and include the major drainage lines across the Survey Area. Threatening processes for these ecosystems include stock, weeds, frequent fires and mining (Kendrick, 2001).

**Table 4.5: 'Ecosystems at risk' within the Survey Area**

Ecosystem at Risk	Analogous Vegetation Type(s)	Landform(s)	Extent within the Survey Area (ha / %)
Grove/ inter-grove mulga, eastern Hamersley Range	<ul style="list-style-type: none"> <li>SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri</li> </ul>	Stony plains	188.7 / 8.7
Valley floor mulga	<ul style="list-style-type: none"> <li>FP AaAinAte(±ExEg) CcEnpoChf BbClvAbl;</li> <li>SP AaAptAp AteSeglErff EnpoCcArc; and</li> <li>FP AaApAte SeglMam EnpoEmuAri Tp.</li> </ul>	Drainage areas/ floodplains, stony plains/ hardpans	152.8 / 7.0
Major ephemeral water courses	<ul style="list-style-type: none"> <li>MA EcrEv AciAcp CcCsEuaMahElp</li> </ul>	Major and medium drainage lines	25.8 / 1.2

## Groundwater Dependent Ecosystems

Two mapped vegetation types, MA EcrEv AciAcp CcCsEuaMahElp and ME CcCsChf EvAci Aads, are considered to be Groundwater Dependent Vegetation (Figure 4.5). These vegetation types comprise

<sup>1</sup> Ecosystems at Risk' were identified by regional ecologists as part of the then Department of Conservation and Land Management's (CALM, now DBCA) Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002 (McKenzie *et al.*, 2003). These ecosystems do not have any formal legislative protection.



3.1 % of the Survey Area and coincide with major and medium drainage lines that run through the Survey Area, as discussed in Section 2.7 (Figure 2.5, Figure 4.5). Vegetation type MA EcrEv AciAcp CcCsEuaMahElp (25.8 ha or 1.2 %) was found in major drainage lines at the northeast tip of the Survey Area where it intersects the Fortescue River, adjacent to Gingianna Pool, and along Western Creek in the far southwest. Vegetation type ME CcCsChf EvAci Aads (41.4 ha or 1.9 %) occurred in medium drainage lines adjacent to the major drainage lines of the Fortescue River and Western Creek, along Western Creek at the western end of the western portion and along three unnamed minor creeklines. Two surface water features were found within MA EcrEv AciAcp CcCsEuaMahElp (WWRP-06 at the Fortescue River and WWRP-04 at Gingianna Pool) and one was found along an unnamed creekline in ME CcCsChf EvAci Aads (WWRP-07) (Figure 4.5).

The field survey recorded two key riparian tree species, *Eucalyptus camaldulensis* subsp. *refulgens* and *Eucalyptus victrix*. *Eucalyptus camaldulensis* subsp. *refulgens* is primarily a facultative phreatophyte<sup>2</sup> and is generally found near rivers and major creek systems with a shallow water table (2 – 5 m below ground) (Landman, 2001). In some locations, however, where soil moisture is consistently recharged by streamflow, *Eucalyptus camaldulensis* may not require groundwater at all and would be termed a vadophyte<sup>3</sup> (SKM, 2012). *Eucalyptus victrix* is primarily a vadophyte and generally occurs in drier areas than *Eucalyptus camaldulensis*. Groundwater studies by Loomes (2010) have shown that the mean minimum water level depth occurring under *Eucalyptus victrix* populations was somewhat greater than that for *Eucalyptus camaldulensis*. The water use strategy of *Eucalyptus victrix* appears to be highly plastic and opportunistic, enabling survival in a wide range of ecohydrological settings (Pfautsch *et al.*, 2014). Several other riparian taxa which indicate persistent (at varying levels) soil moisture presence were found during the field survey (Table 4.6). Limited information is known on the water use strategies of such species, although they are considered unlikely to be groundwater dependent. These species readily grow in areas of the landscape which receive seasonal throughflow and focusing of surface runoff (i.e., minor creeklines) following rainfall events and are therefore reliant on varying degrees of water available within the riparian zone. No obligate phreatophytes<sup>4</sup> were found in the Survey Area.

Vegetation type MA EcrEv AciAcp CcCsEuaMahElp contained both *Eucalyptus camaldulensis* subsp. *refulgens* and *Eucalyptus victrix* as well as a number of taxa more typical of larger drainage systems and/ or permanent pools such as *Acacia coriacea* subsp. *pendens*, *Eleocharis pallens* and *Melaleuca glomerata* (these were not found in any other vegetation type). *Melaleuca glomerata* is a widespread arid-zone paperbark and can occur in association with spring-fed pools (SKM, 2001). Vegetation type MA EcrEv AciAcp CcCsEuaMahElp is likely to have a moderate dependence upon access to

<sup>2</sup> Facultative phreatophytes are deep-rooted plants which utilise groundwater to satisfy at least some portion of their EWR (Environmental Water Requirement) but if required, may also satisfy their total EWR via soil moisture (SKM, 2010).

<sup>3</sup> Vadophytes are plants commonly associated with drainage lines which rely on moisture in the soil surface profiles and are independent of groundwater

<sup>4</sup> Obligate phreatophytes are deep-rooted plants which utilise groundwater to satisfy some or all of their EWR (SKM, 2010).



groundwater and potentially represents a GDE. Vegetation type ME CcCsChf EvAci Aads contained *Eucalyptus victrix*, however *Eucalyptus camaldulensis* subsp. *refulgens*, *Melaleuca glomerata* and *Eleocharis pallens* were absent (Table 4.6). This vegetation type is likely to have a low dependence upon access to groundwater, particularly in dry conditions, but is unlikely to represent a GDE. The actual usage of groundwater for both vegetation types, however, is dependent upon the underlying geology, hydrogeology, aquifer levels and characteristics, as well as seasonal climatic fluctuations.

Groundwater Dependent Vegetation types, MA EcrEv AciAcp CcCsEuaMahElp and ME CcCsChf EvAci Aads are locally significant and the major drainage lines are also considered 'ecosystems at risk' on a subregional scale, as previously discussed. However, due to the long and linear nature of the Survey Area, their presence and coverage within the Survey Area are minimal, at approximately 67 ha or 3.1 %.



**Table 4.6: Riparian flora taxa recorded from the Survey Area**

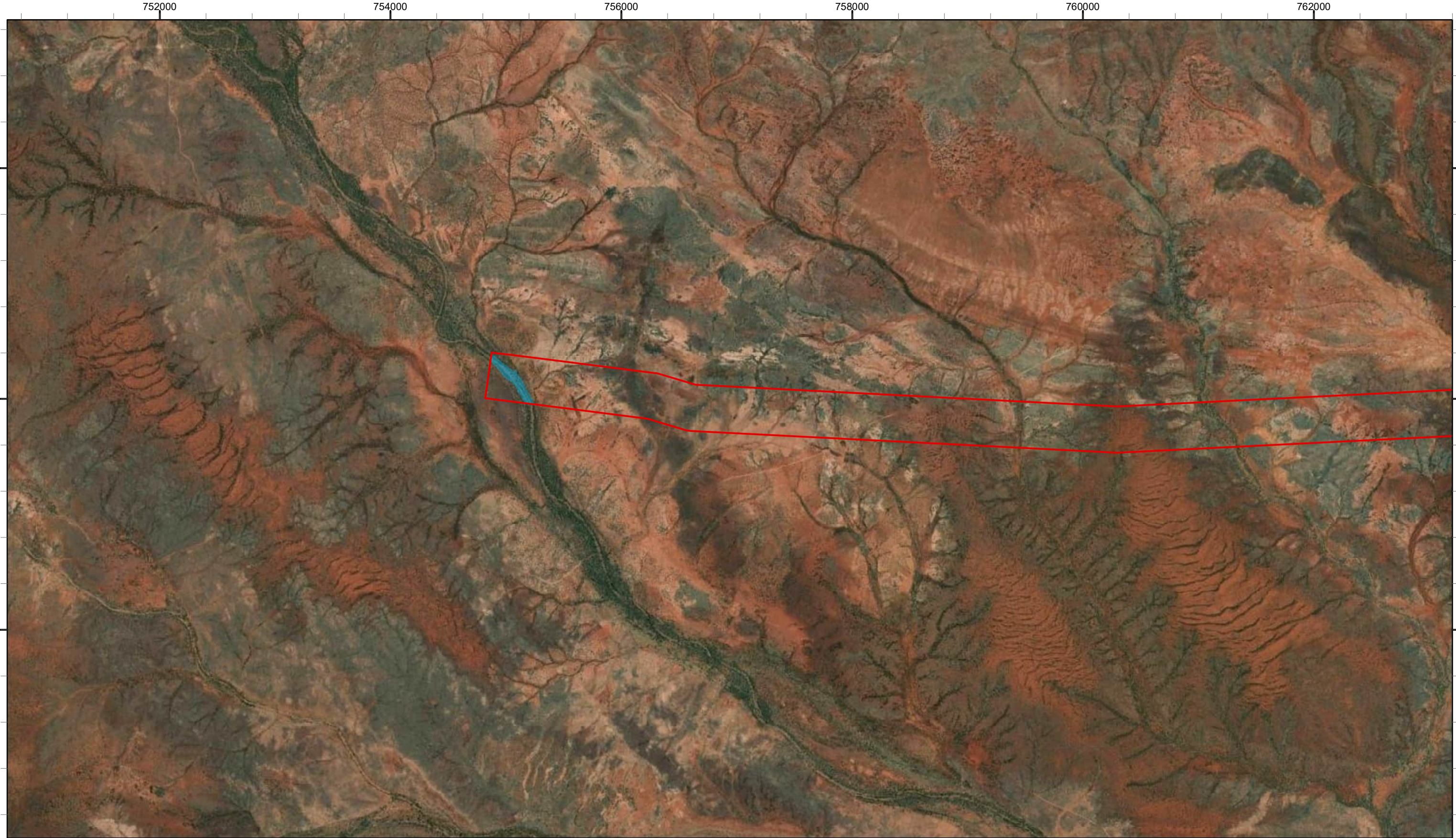
NB: Information collated from Cook &amp; Eamus, 2018; SKM, 2001, 2012; WAH, 1998-

Taxon	Lifeform	Ecohydrological Category/ Interpretation	Ecohydrological Notes	Recorded within Groundwater Dependent Vegetation Types:	
				MA EcrEv AciAcp CcCsEuaMahElp	ME CcCsChf EvAci Aads
<i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>	Tree	Facultative phreatophyte/ Vadophyte	Medium to high groundwater dependence	✓	
<i>Eucalyptus victrix</i>	Tree	Vadophyte/ Facultative phreatophyte	Medium groundwater dependence	✓	✓
<i>Eucalyptus xerothermica</i>	Tree	Vadophyte/ Facultative phreatophyte	Low to Moderate groundwater dependence		✓
<i>Melaleuca glomerata</i>	Shrub/ Tree	Vadophyte/ Facultative phreatophyte (inferred)	Potentially dependent on groundwater	✓	
<i>Abutilon amplum</i>	Shrub	Mesic indicator - low level	Potentially dependent on groundwater		✓
<i>Acacia citrinoviridis</i>	Tree/ Shrub	Mesic indicator - low level	Potentially dependent on groundwater	✓	✓
<i>Acacia coriacea</i> subsp. <i>pendens</i>	Shrub/ Tree	Mesic indicator - low level	Potentially dependent on groundwater	✓	
<i>Cyperus vaginatus</i>	Perennial Sedge	Mesic indicator - moderate level	Not groundwater dependent.	✓	✓
<i>Eleocharis pallens</i>	Perennial Sedge	Emergent macrophyte	Taxon grows in swamps and pools. May be indirectly groundwater-dependent if growing in spring-fed pools.	✓	
<i>Schoenoplectiella</i> <i>dissachantha</i>	Perennial Sedge	Mesic indicator - moderate level	Not groundwater dependent.	✓	
<i>Marsilea hirsuta</i>	Perennial Fern	Mesic indicator - moderate level	Not groundwater dependent.	✓	✓
<i>Marsilea drummondii</i>	Perennial Fern	Mesic indicator - moderate level	Not groundwater dependent.		✓
<i>Sesbania cannabina</i>	Annual Herb or Shrub	Mesic indicator - low level	Dependent on seasonal surface water flows for germination and growth. Not groundwater dependent.	✓	✓
<i>Alternanthera angustifolia</i>	Annual Herb	Mesic indicator - low level		✓	✓
<i>Alternanthera denticulata</i>	Annual/ Perennial Herb	Mesic indicator - low level			✓





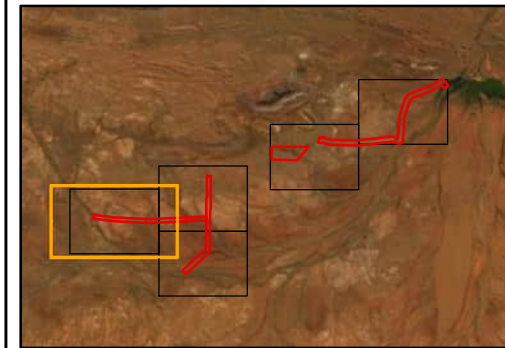
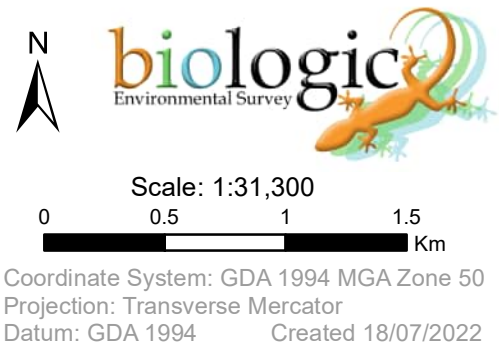
Taxon	Lifeform	Ecohydrological Category/ Interpretation	Ecohydrological Notes	Recorded within Groundwater Dependent Vegetation Types:	
				MA EcrEv AciAcp CcCsEuaMahElp	ME CcCsChf EvAci Aads
<i>Alternanthera nana</i>	Herb or Shrub	Mesic indicator - low level	Not groundwater dependent.	✓	
<i>Leptochloa digitata</i>	Perennial Grass	Mesic indicator - low level	Not groundwater dependent.	✓	





#### Legend

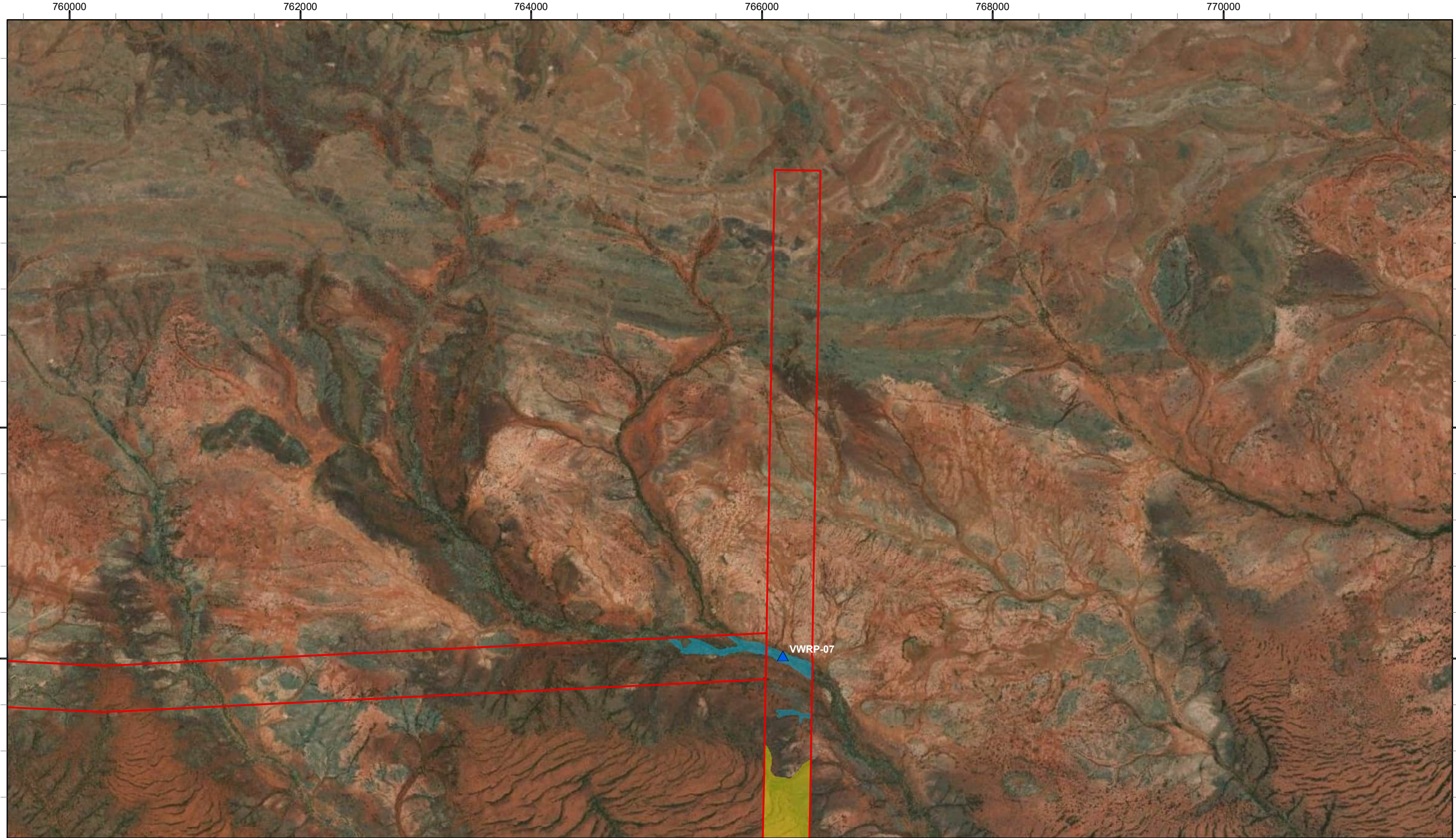
-  Survey Area
- Groundwater Dependent Ecosystem**
-  ME CcCsChf EvAci Aads




**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 4.5a: Significant**  
**features in the Survey Area**





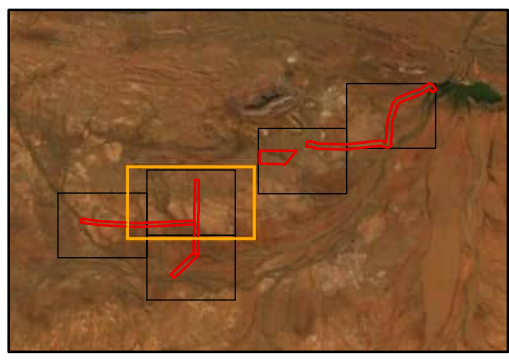
- Legend**
- Survey Area
  - ▲ Water Feature
  - Groundwater Dependent Ecosystem**
    - ME CcCsChf EvAci Aads
  - Sheet-flow Dependent Ecosystem**
    - SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri



Scale: 1:31,300

0 0.5 1 1.5 Km

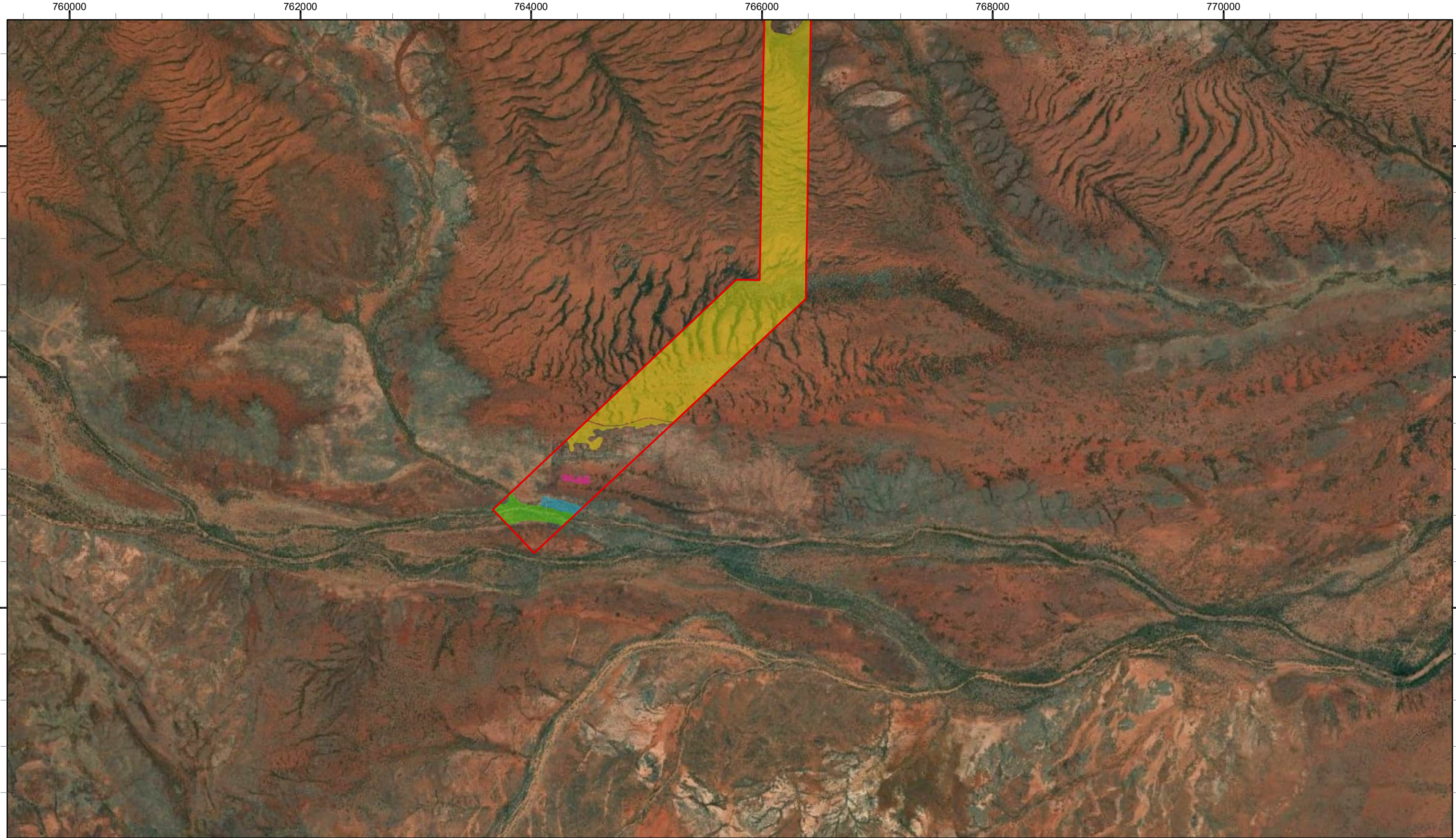
Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994 Created 18/07/2022




**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 4.5b: Significant**  
**features in the Survey Area**







**Legend**


 Survey Area

**Gilgai Plain (cracking clay)**


 GP EriCSeao ErfcEnpoDish(±AselAspe) AaAte



**Groundwater Dependent Ecosystem**

 MA EcrEv AciAcp CcCsEuaMahElp

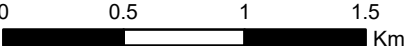
 ME CcCsChf EvAci Aads

**Sheet-flow Dependent Ecosystem**

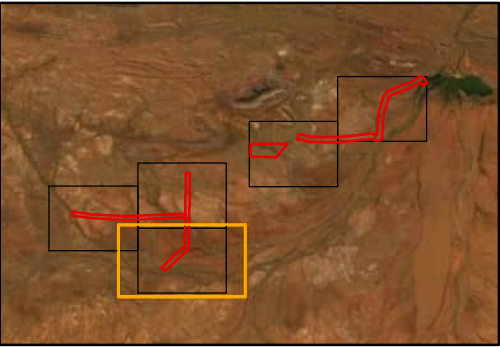
 SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri

Scale: 1:31,300



Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994      Created 18/07/2022

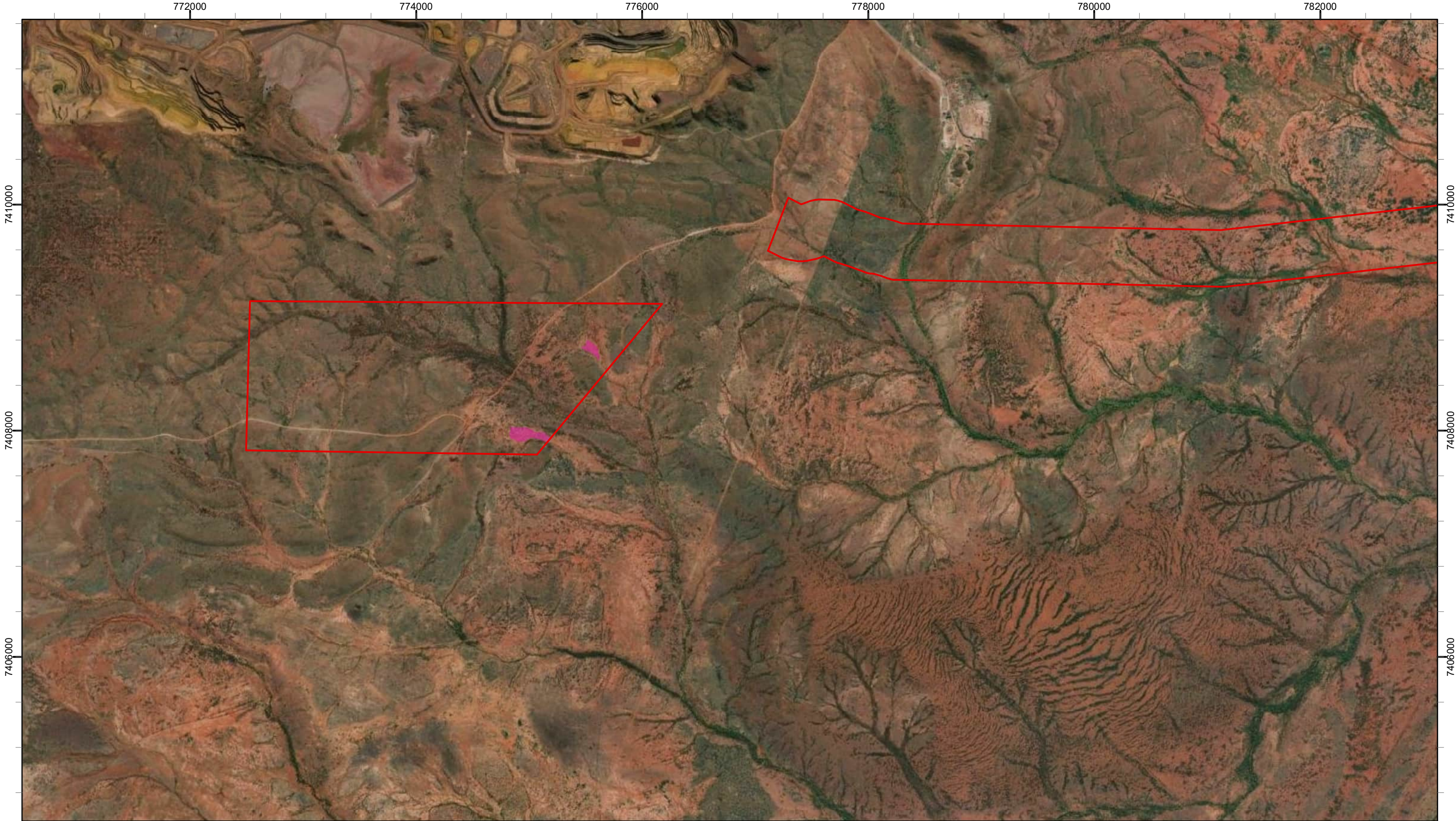




**BHP WAIO**



**Western Ridge Pipeline  
Reconnaissance Flora and  
Vegetation Survey**

**Figure 4.5c: Significant  
features in the Survey Area**

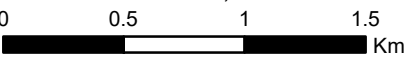




- Legend**
-  Survey Area
  - Gilgai Plain (cracking clay)**
    -  GP ErlcSeao ErfcEnpoDish(±AselAspe) AaAte

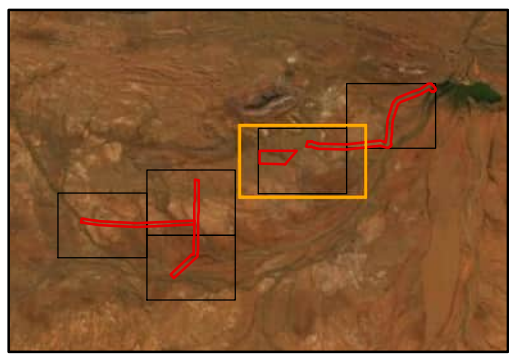


Scale: 1:31,300



0 0.5 1 1.5 Km

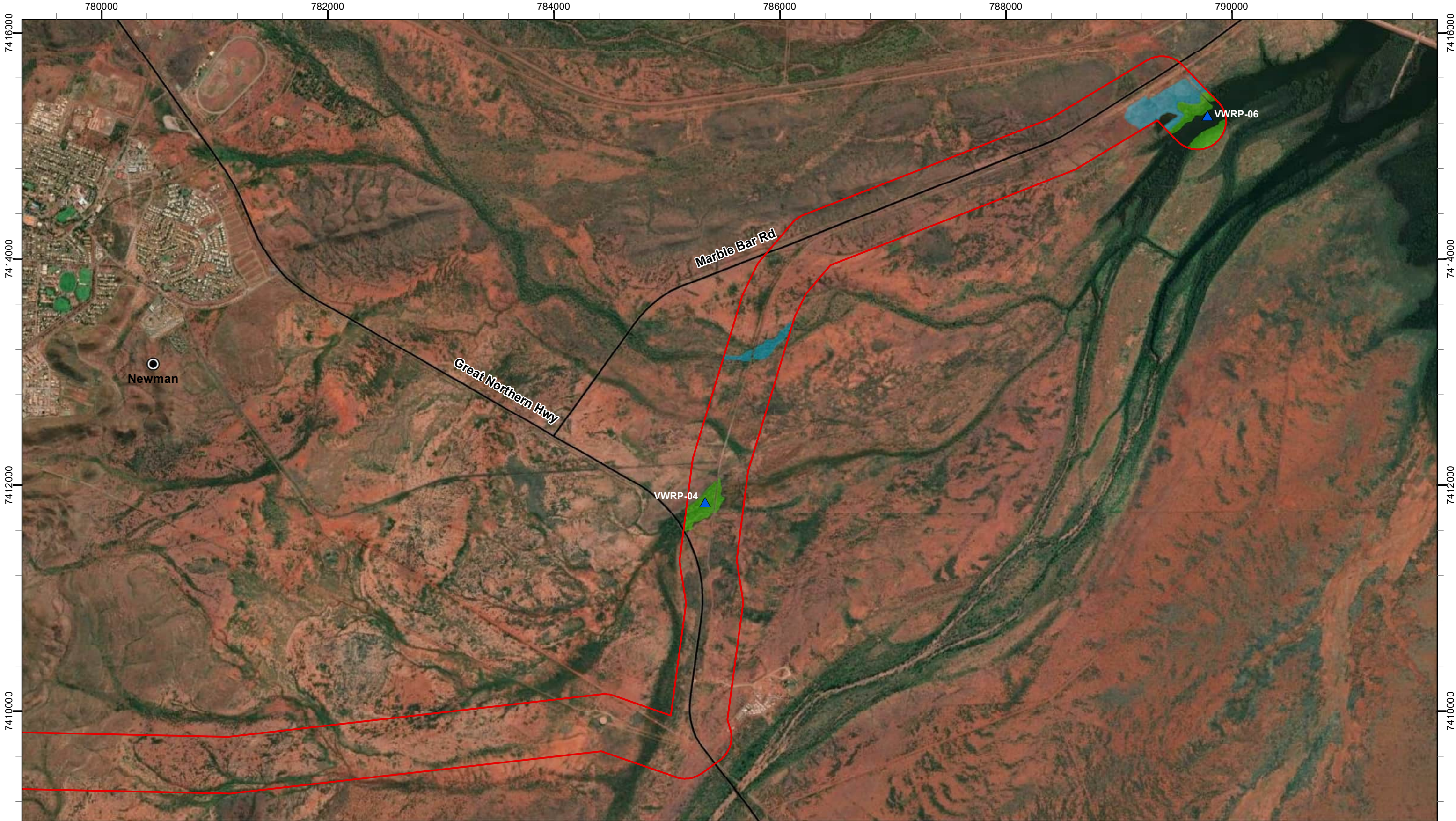
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Projection: Transverse Mercator  
Datum: GDA 1994      Created 18/07/2022



**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

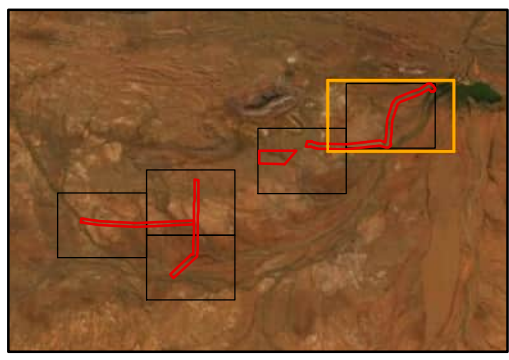
**Figure 4.5d: Significant**  
**features in the Survey Area**





- Legend**
- |               |                                        |
|---------------|----------------------------------------|
| Survey Area   | <b>Groundwater Dependent Ecosystem</b> |
| State Road    | MA EcrEv AciAcp                        |
| Water Feature | ME CcCsChf EvAci Aads                  |

Scale: 1:31,300  
0 0.5 1 1.5 Km  
Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994 Created 18/07/2022



**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 4.5e: Significant**  
**features in the Survey Area**



## Sheet-flow Dependent Ecosystems

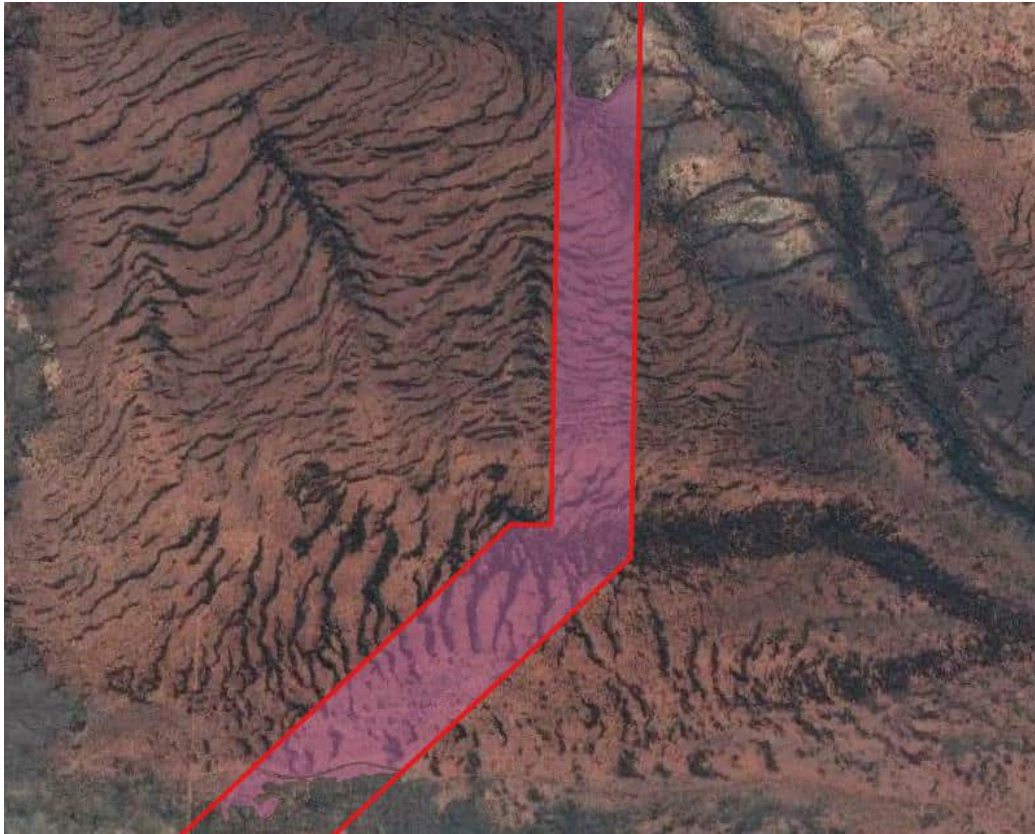
Vegetation type SP AinAaAsu( $\pm$ GrbAprCocd) ErffSegfSeah EnpoArcAri is considered to represent a sheet-flow dependent ecosystem (Figure 4.5). This vegetation type is a low woodland containing two mulga species, *Acacia aptaneura* and *Acacia incurvaneura*. The grove/ intergrove structure was evident from aerial photography and was confirmed by on-ground observation. The vegetation occurred on brown clay loam on hardpan and stony plains. Groves were longitudinally oriented strips of low mulga woodland over low scattered tussock grasses, whilst intergrove areas were relatively bare with only scattered shrubs and tussock grasses (Plate 4.4; Plate 4.5). This is typical of banded vegetation whereby the groves intercept overland sheet flow resulting in accumulation of biomass and unique flora assemblages. Several species were recorded in vegetation type SP AinAaAsu( $\pm$ GrbAprCocd) ErffSegfSeah EnpoArcAri that did not occur elsewhere within the Survey Area, including *Acacia subcontorta*, *Eragrostis eriopoda*, *Indigofera georgei*, *Maireana villosa*, *Monachather paradoxus*, *Paspalidium clementii*, *Ptilotus schwartzii* var. *schwartzii* and *Senna glaucifolia*. Groved vegetation systems play an important part in controlling erosion on landforms that are prone to sheetflow (Saco *et al.*, 2007).

SP AinAaAsu( $\pm$ GrbAprCocd) ErffSegfSeah EnpoArcAri was located in the southwest portion of the Survey Area and broadly coincided with the Spearhole Land System, which is known to support sheet flow. The Spearhole Land System also runs to the south of the western portion, where extensive banded vegetation with a clear grove/ intergrove structure can be seen on aerial photography. Banded vegetation was not observed within the western portion, but there were some areas of vegetation type SP AaAin ErfsSeglErlt EnpoCc directly adjacent to banded vegetation outside of the Survey Area. Vegetation type SP AaAin ErfsSeglErlt EnpoCc also exhibited intergrove structure i.e., a tall sparse shrubland of *Acacia aptaneura* and *Acacia incurvaneura*, and thus may contribute to overland flow of water into the banded vegetation south of the Survey Area.

The vegetation occurring in association with the Elimunna Land System, which is also known to support sheet flow, occurred in the northeast and central areas of the Survey Area. The vegetation in this area contained several mulga-dominated vegetation types. However, there was no obvious mulga banding or groving/ intergroving which would indicate sheet-flow dependency and therefore this part of the Survey Area is not considered to contain sheet-flow dependent ecosystems.

Further mulga woodlands/ shrubland were recorded across the Survey Area, however these communities either did not display any banding or occurred in association with landforms not subject to sheet-flow.





NB: Pink shading indicates vegetation type SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri

**Plate 4.4: Aerial imagery of mulga grove/ intergrove vegetation structure**



**Plate 4.5: Sheet-flow dependent vegetation within the Survey Area, with mulga groves/ banding (L) and sparse intergrove vegetation with a band of mulga in the distance (R)**

### Water Features

Water features are a limiting factor for many ecosystems (James *et al.*, 1995), particularly within arid-zone ecosystems such as the Pilbara. They also often represent areas of comparatively high ecological productivity (Murray *et al.*, 2003) by providing specific ecosystem functions supporting unique and important biological diversity at both local and regional scales (depending on the size and function of the water feature) (Boulton & Hancock, 2006; Humphreys, 2006; Murray *et al.*, 2006).



Three water features were recorded within the Survey Area during the field survey (Figure 4.5). Of the three water features recorded, one (WWRP-01) is a section of the Fortescue River where water pools for prolonged periods following rainfall events and is likely to be semi-permanent. The extent of this water feature extends well beyond the boundary of the Survey Area and forms a continuation of the MA EcrEv AciAcp CcCsEuaMahElp vegetation type. Water feature WWRP-02 was located adjacent to Gingianna Pool and WWRP-03 was found along an unnamed creekline in the southwest portion of the Survey Area. Both WWRP-02 and WWRP-03 are likely to be seasonal, with the presence of water likely due to recent rainfall preceding the field survey.

#### 4.2.5 Vegetation Condition

The condition of the vegetation within the Survey Area ranged from completely degraded to excellent (Table 4.7 and Figure 4.6). The majority of the vegetation was in good or higher condition (1,903 ha / 88 %). The main disturbances observed were associated with pastoralism. There were signs of cattle grazing and trampling across of the Survey Area, excluding the hillcrests and ridges. It is likely that the main introduced taxa, *\*Cenchrus ciliaris* would have been transported across the Survey Area via pastoralism and cattle grazing. The areas of the Survey Area lower in the landscape were more heavily impacted by cattle, including the floodplains and drainage lines.


**Table 4.7: Vegetation condition extent in the Survey Area**

Condition	Extent within the Survey Area (ha / %)	Comment
Excellent	496.9 / 22.9	Excellent vegetation was found on most of the central Survey Area portion, and small areas of the southwest and northeast portions. Majority was located on hillslopes (321 ha).
Very Good	844.2 / 38.9	Vegetation in very good condition was found across large parts of each Survey Area portion. Majority was located on drainage areas/ floodplains, stony plains, and hillslopes (206 ha, 170 ha, 117 ha respectively).
Good	561.6 / 25.9	Good vegetation was found across all three Survey Area portions. Majority was located on stony plains (337 ha).
Poor	142.4 / 6.6	Vegetation in poor condition was found along and south of Marble Bar Rd and along drainage lines throughout the Survey Area. Majority was located on drainage areas/ floodplains (84 ha).
Degraded	72.5 / 3.3	Degraded vegetation was found in association with roads and infrastructure in the northeast portion, as well as drainage lines in the central and southwest Survey Area portions. Majority was located on drainage areas/ floodplains (49 ha).
Completely Degraded	0.4 / 0.02	Rehab mapping unit
Cleared	51.4 / 2.4	Cleared mapping unit
N/A	8.5 / 0.4	Open water mapping unit
<b>TOTAL</b>	<b>2,169.4 / 100</b>	








**Legend**


 Survey Area


**Vegetation Condition**



 Excellent

 Very Good

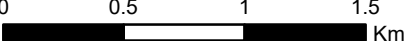
 Good

 Poor

 Cleared

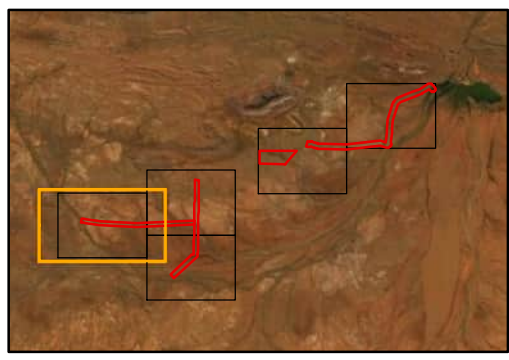


Scale: 1:31,300



0 0.5 1 1.5 Km

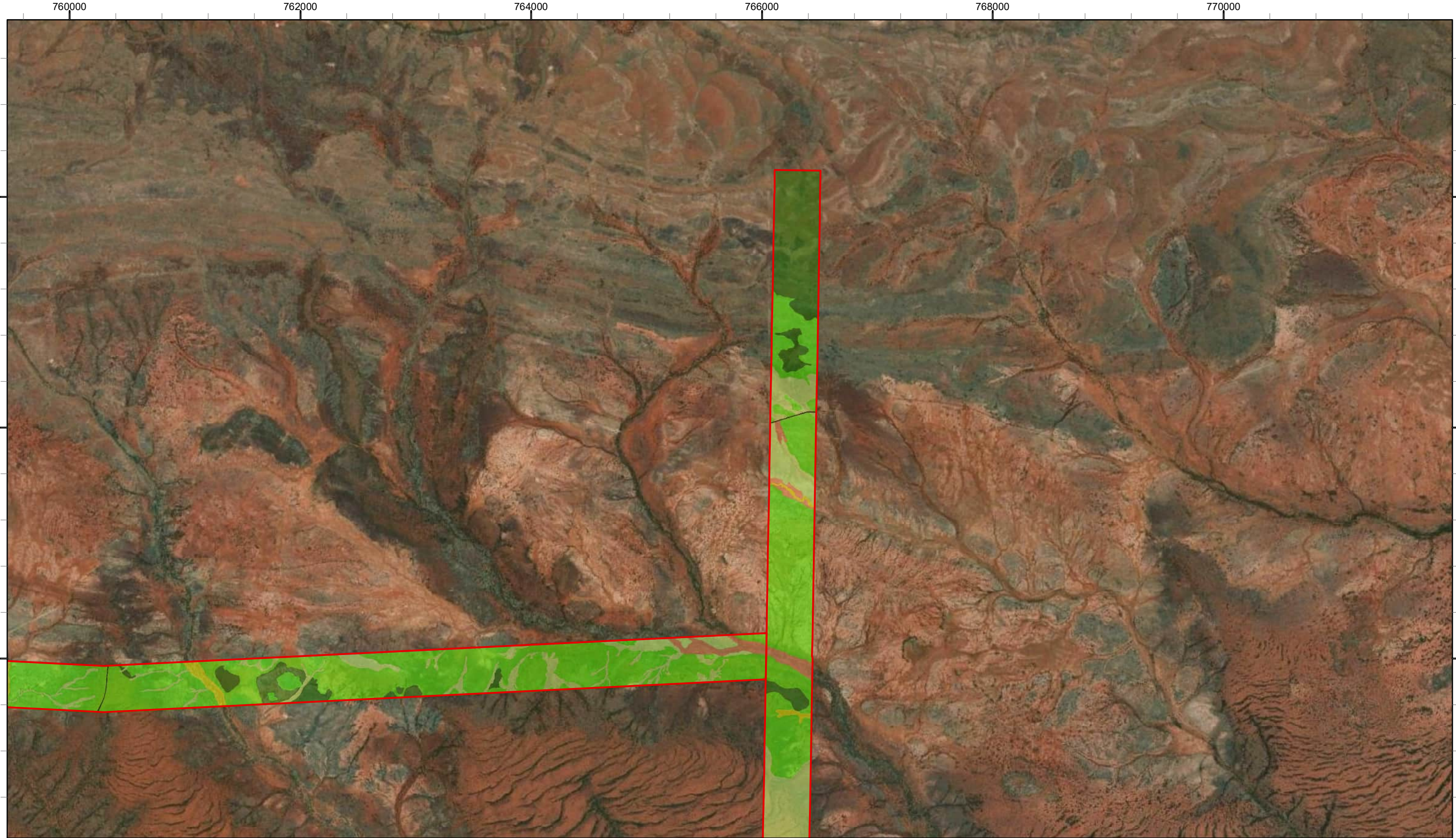
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Projection: Transverse Mercator  
Datum: GDA 1994      Created 18/07/2022




**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 4.6a: Vegetation**  
**condition in the Survey Area**








**Legend**


 Survey Area


**Vegetation Condition**


 Excellent



 Very Good

 Good

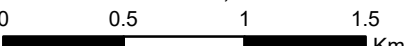
 Poor

 Degraded

 Cleared



Scale: 1:31,300



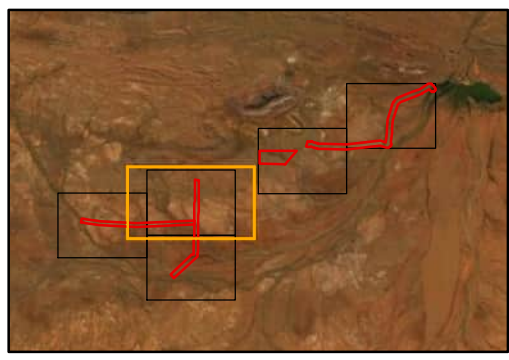
0 0.5 1 1.5 Km

Coordinate System: GDA 1994 MGA Zone 50

Projection: Transverse Mercator

Datum: GDA 1994

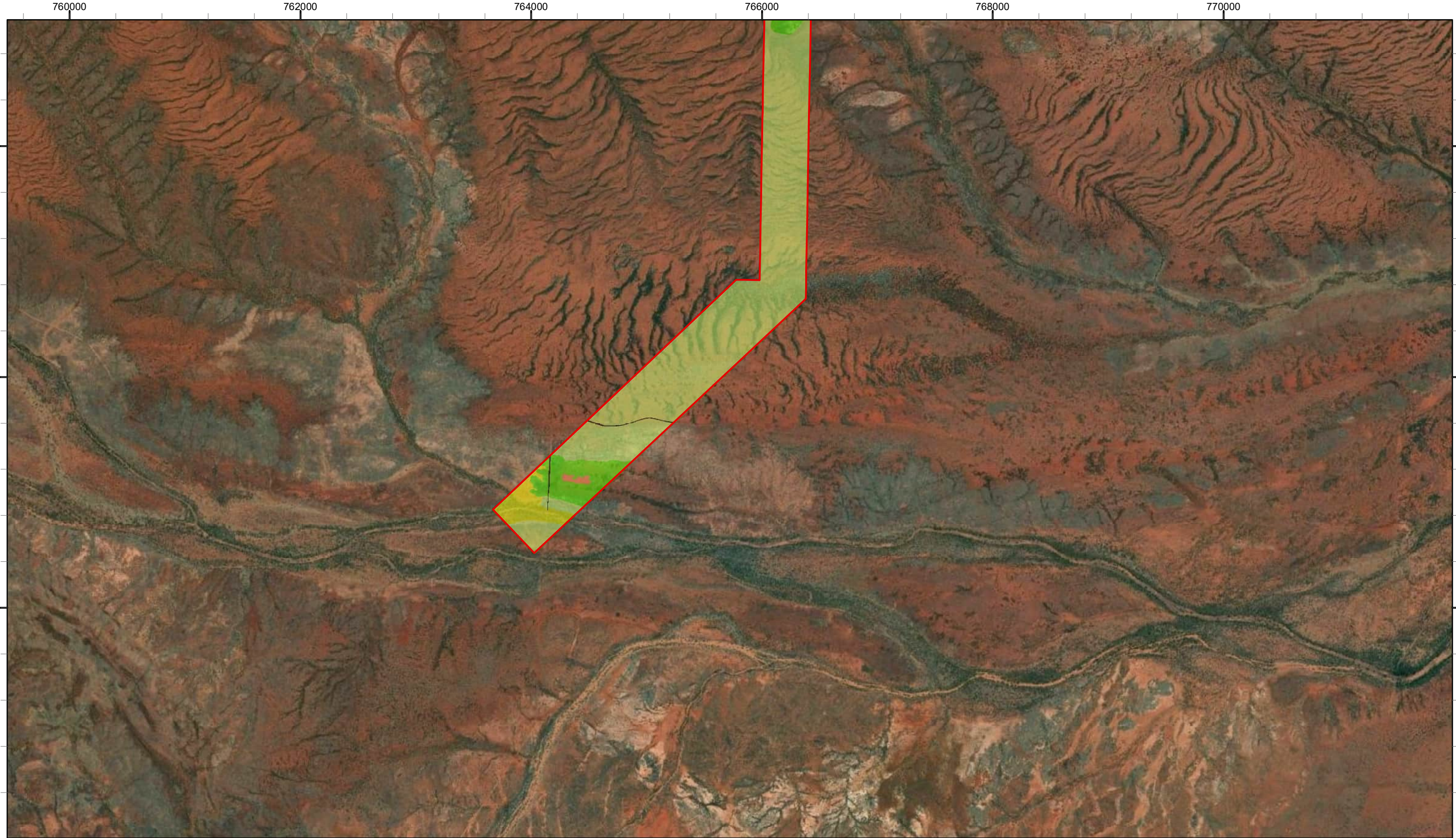
Created 18/07/2022




**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 4.6b: Vegetation**  
**condition in the Survey Area**








**Legend**


 Survey Area


**Vegetation Condition**



 Very Good

 Good

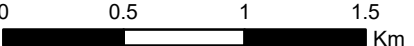
 Poor

 Degraded

 Cleared

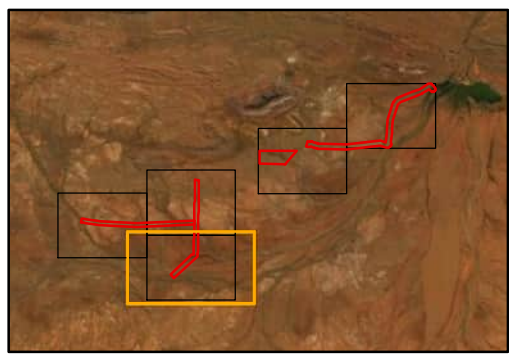


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00.511.5Km

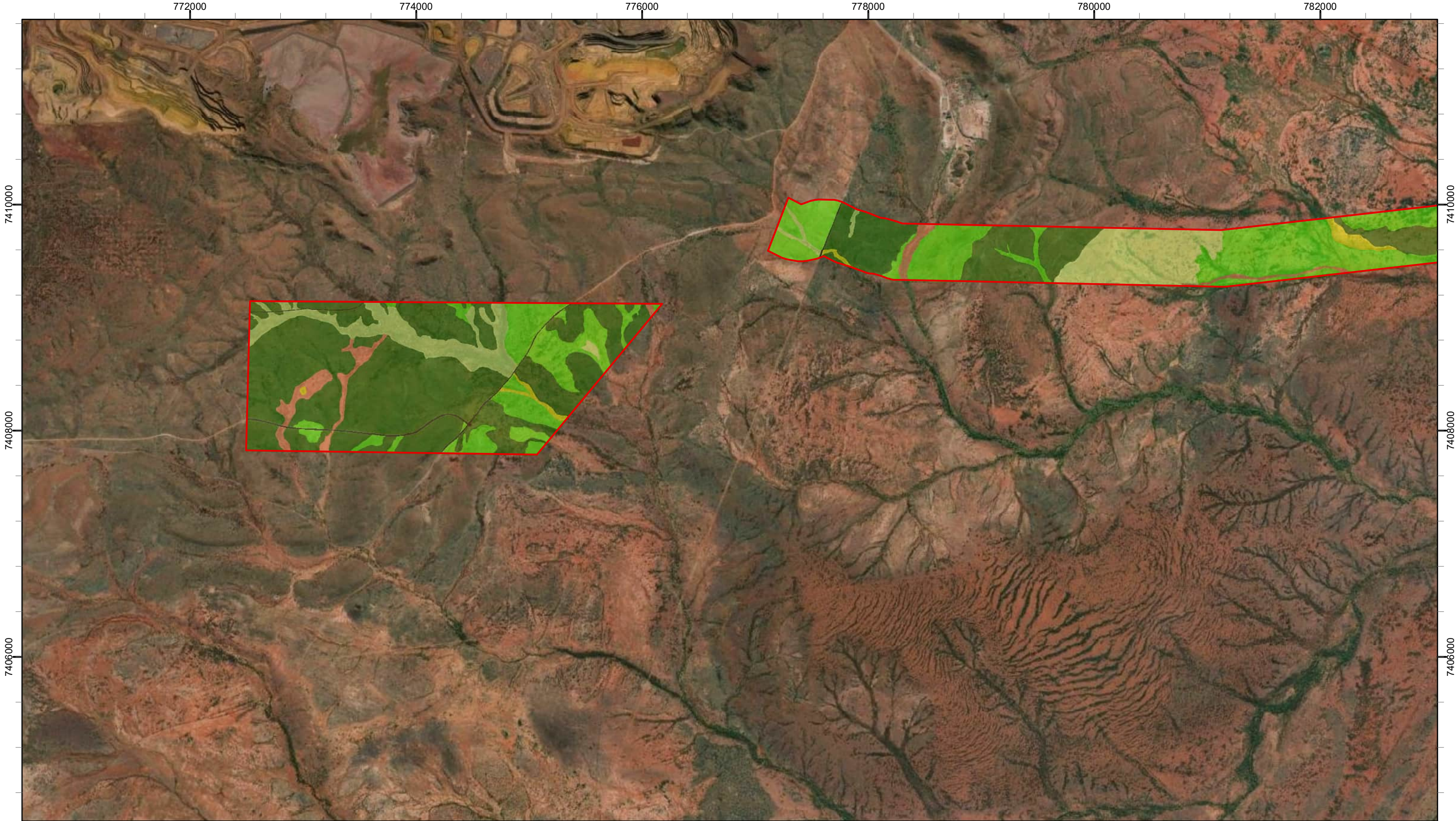
Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994      Created 18/07/2022




**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 4.6c: Vegetation**  
**condition in the Survey Area**













**Legend**

 Survey Area

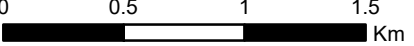
**Vegetation Condition**

-  Excellent
-  Very Good
-  Good

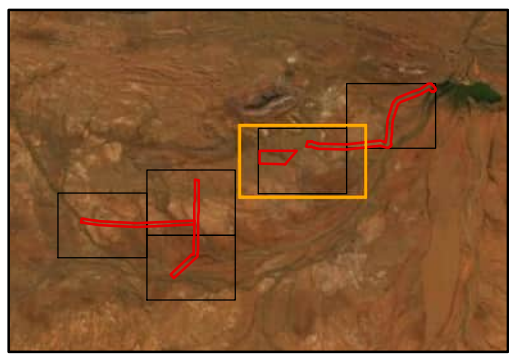
-  Poor
-  Degraded
-  Cleared



Scale: 1:31,300

  
0 0.5 1 1.5 Km

Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994      Created 18/07/2022




**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**


**Figure 4.6d: Vegetation**  
**condition in the Survey Area**







**Legend**


 Survey Area


 State Road


**Vegetation Condition**


 Excellent


 Very Good



 Good

 Poor

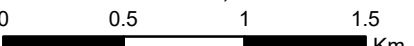
 Degraded

 Completely Degraded

 Cleared

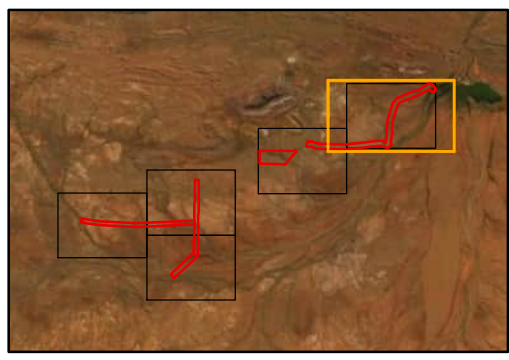


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Coordinate System: GDA 1994 MGA Zone 50  
Projection: Transverse Mercator  
Datum: GDA 1994      Created 25/07/2022



**BHP WAIO**  
**Western Ridge Pipeline**  
**Reconnaissance Flora and**  
**Vegetation Survey**

**Figure 4.6e: Vegetation**  
**condition in the Survey Area**



### 4.3 Review of Occurrence Assessment

The review of occurrence assessment provides detailed reasoning for significant flora species considered highly likely to possible to occur pre-survey, as well as two taxa that were upgraded from an unlikely pre-survey likelihood (Table 4.8). One significant taxon, *Rhagodia* sp. Hamersley (M. Trudgen 17794) (P3), was confirmed to occur in the Survey Area during the field survey. This taxon was considered unlikely to occur pre-survey.

The level of survey (reconnaissance) was taken into account for the post-survey likelihood assessment. It is unlikely that medium to large perennial taxa were missed within the relevés sampled and areas traversed (Figure 3.2); however, for significant flora where suitable habitat was noted, it is possible that they may still occur in areas that were not intensively traversed.

Two taxa identified by the desktop assessment, *Ipomoea racemigera* (P2) and *Aristida lazaridis* (P2), were found by a concurrent survey conducted by Biologic (Biologic, 2022). *Ipomoea racemigera* (P2) was found where the two survey areas overlapped, and its likelihood was thus upgraded to confirmed. *Aristida lazaridis* (P2) was recorded approximately 1 km to the west of the Survey Area. Suitable habitat was found in the Survey Area, and as such, the likelihood for *Aristida lazaridis* (P2) has been upgraded to possible.

The remainder of the significant species, with a pre-survey likelihood of unlikely or highly unlikely, are displayed in Appendix F. Fourteen out of 22 unlikely taxa were downgraded to highly unlikely, primarily due to there being limited or absent suitable habitat or because they were large perennial taxa. All species assessed as highly unlikely to occur remained so post-survey. The indeterminate specimen, *Chenopodiaceae* sp. indet., was either a *Sclerolaena* or *Maireana*, but could not be differentiated without flowering or fruiting material. There were also indeterminate *Maireana* specimens found during the March 2022 survey. One priority *Maireana* (*M. prosthocochaeta* (P3)) was considered unlikely to occur pre-survey. Given that 11 other species of *Maireana* and *Sclerolaena* were found, and there was no suitable habitat within the Survey Area, it is unlikely that any of these specimens are analogous with *M. prosthocochaeta*. Its likelihood has thus been downgraded to highly unlikely.

**Table 4.8: Post-survey assessment of occurrence for significant flora**

Taxon	Post-survey Likelihood	Reason for Change in Likelihood
<b>Pre-survey likelihood – Highly Likely</b>		
<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727) (P3)	Possible	Species is an inconspicuous small annual/ biannual herb that is likely to have been growing at the time of survey, if present. Limited suitable habitat was observed (calcrete plains/ vegetation type CP TragTpTw AbAsySeao Ese, 76.1 ha or 4.4 % of the Survey Area). It is still possible that this species occurs within areas of calcrete plains that were not intensively traversed.
<b>Pre-survey likelihood – Likely</b>		
<i>Swainsona thompsoniana</i> (P3)	Likely	Inconspicuous small annual herbs that may not have been growing at the time of survey. Suitable habitat present within Survey Area.
<i>Goodenia nuda</i> (P4)	Likely	



Taxon	Post-survey Likelihood	Reason for Change in Likelihood
Pre-survey likelihood – Possible		
<i>Ipomoea racemigera</i> (P2)	Confirmed	Confirmed within the Survey Area by a concurrent survey (Biologic, 2022).
<i>Aristida jerichoensis</i> var. <i>subspinulifera</i> (P3)	Possible	Suitable habitat present within Survey Area. Taxon is a short-lived perennial tussock grass that grows throughout the year following substantial rainfall events. Due to the lower than average rainfall in the weeks preceding the survey, conditions may not have been favourable for germination/ growth of this taxon. As it may not have been present at time of survey it is still considered possible to occur.
<i>Gymnanthera cunninghamii</i> (P3)	Unlikely	Limited suitable habitat observed within Survey Area. Conspicuous perennial taxon unlikely to have been missed.
<i>Hibiscus campanulatus</i> (P1)	Highly Unlikely	Marginal or unsuitable habitat for these taxa was observed within the Survey Area during the field survey.
<i>Isotropis parviflora</i> (P2)	Highly Unlikely	
<i>Indigofera gilesii</i> (P3)	Highly Unlikely	
<i>Lepidium catapycnon</i> (P4)	Highly Unlikely	
Pre-survey likelihood – Unlikely		
<i>Aristida lazaridis</i> (P2)	Possible	Suitable habitat present within the Survey Area. Record found approximately 1 km from the Survey Area by Biologic (2022).
<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794) (P3)	Confirmed	Confirmed within the Survey Area.

#### 4.4 Survey Adequacy

A total of 148 sites (relevés) have been sampled across the Survey Area, totalling 0.07 sites sampled per hectare of native vegetation. The number of sites sampled per hectare can be highly variable depending on the total survey area size, survey area shape and the number of different vegetation types present; however, reconnaissance surveys are typically less intensive than detailed flora and vegetation surveys. The sampling intensity of the Survey Area is consistent with the flora and vegetation surveys reviewed in the desktop assessment, ranging from 0.004 to 1.25 sites per hectare (Table 4.9). It should be noted that not all the reports reviewed in the desktop assessment contained the relevant survey details (i.e., survey area size) and therefore their survey intensity is unknown.

**Table 4.9: Comparison of known survey intensity and effort in the Survey Area**

Survey	Study			Taxa Counts			Significant Flora	
	Area (ha)	Sampling Intensity	Sites per ha	Total	Families	Genera	Priority Flora	Introduced
Biota (2001)	17,060	60	0.004	380	98	168	-	11
Onshore and Biologic (2009)	2,609	30	0.01	201	40	100	-	17
ENV (2012)	8,830	51	0.01	422	52	167	4	19
ENV (2011b)	703	15	0.02	127	31	64	-	7
GHD (2011a)	6,100	123	0.02	347	48	159	3	13



Survey	Study			Taxa Counts			Significant Flora	
	Area (ha)	Sampling Intensity	Sites per ha	Total	Families	Genera	Priority Flora	Introduced
ENV (2010)	844	29	0.03	189	37	86	-	3
Biologic (2020b)	1,204	39	0.03	152	29	70	-	3
Biologic (2020a)	1,745	50	0.03	185	34	91	-	9
ENV (2006c)	250	10	0.04	168	39	99	-	8
GHD (2008a)	3,600	141	0.04	321	52	141	-	14
ENV (2009c)	~170	10	0.06	124	28	65	-	5
<b>Current survey</b>	<b>2,169</b>	<b>148</b>	<b>0.07</b>	<b>279</b>	<b>38</b>	<b>115</b>	<b>2</b>	<b>11</b>
Astron (2014)	120	8	0.07	54	21	35	-	2
ENV (2009b)	~2,300	180	0.08	501	58	172	6	14
ENV (2009a)	35	5	0.14	80	24	53	-	6
Onshore (2014b)	720	128	0.18	199	32	93	-	7
ENV (2006d)	220	45	0.2	285	47	115	-	13
Eco Logical (2011)	52	14	0.27	33	6	15	-	2
Astron (2010)	23	7	0.3	71	18	38	-	2
ENV (2006b)	30	9	0.3	117	25	59	-	7
Eco Logical (2012)	~3	3	1	52	14	26	-	1
Onshore (2015)	28	35	1.25	125	25	73	-	15
ENV (2006a)	-	81	-	243	42	117	1	7
ecologia (2006a)	-	36	-	152	35	79	-	3
HGM (1999b)	-	10	-	206	44	101	-	4
ecologia (2005)	-	7	-	91	28	47	-	-



## 5 CONCLUSION

A single season reconnaissance flora and vegetation survey was completed over a total of eleven days, comprising of two separate field surveys, with all major vegetation communities visited and sampled. A total of 148 relevés were sampled in the Survey Area, with an additional 21 relevés being sampled in the adjacent Paddy Bore Survey Area. The floristic data recorded was used to determine the vegetation types and their condition within the Survey Area. Work was completed to a level sufficient to meet EPA requirements. The key findings of the survey include:

- A total of 279 confirmed vascular flora taxa from 38 families and 115 genera, comprising 268 native and 11 introduced taxa. The total increases to 295 confirmed flora taxa, comprising 284 native and 11 introduced taxa, when the taxa from the adjacent Paddy Bore Survey Area are included in the total;
- Two priority listed significant flora taxa were recorded from the Survey Area:
  - *Rhagodia* sp. Hamersley (M. Trudgen 17794) (P3) – 66 individuals recorded from 59-point locations and;
  - *Ipomoea racemigera* (P2) – 56 individuals from six-point locations (recorded from a concurrent Biologic (2022) survey which overlapped a portion of the Survey Area).
- Ten taxa considered to be flora of “other” significance, including seven range extensions, two locality holes and one hybrid;
- None of the 11 introduced taxa recorded within the Survey Area are listed as WoNS, DPs or ‘Priority Alert’ weeds;
- Twenty-nine vegetation types were described and delineated from 18 broad floristic formations across nine landforms;
- No TECs or PECs were recorded from the Survey Area;
- One vegetation type, GP ErlcSeao ErfcEnpoDish(±AselAspe) AaAte, shared affinities with P1 PEC ‘West-Angelas Cracking-Clays’, but was determined not to represent this PEC;
- Five vegetation types, SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri, FP AaAinAte(±ExEg) CcEnpoChf BbClvAbl, SP AaAptAp AteSeglErff EnpoCcArc, FP AaApAte SeglMam EnpoEmuAri Tp and MA EcrEv AciAcp CcCsEuaMahElp, are considered an ‘ecosystem at risk’ for the Hamersley subregion;
- Two vegetation types are considered to be groundwater dependent vegetation:
  - MA EcrEv AciAcp CcCsEuaMahElp likely has moderate dependence on groundwater and may represent a groundwater dependent ecosystem and;
  - ME CcCsChf EvAci Aads likely has low dependence on groundwater but is unlikely to represent a groundwater dependent ecosystem.
- One vegetation type, SP AinAaAsu(±GrbAprCocd) ErffSegfSeah EnpoArcAri, is considered to be a sheet-flow dependent ecosystem; and
- The vegetation condition ranged from completely degraded to excellent, with the majority (88 %) considered to be in good or better condition.



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## **7 APPENDICES**



## Appendix A: State and Federal Conservation Codes



## International Union for Conservation of Nature

Category	Definition
<b>Extinct (EX)</b>	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.
<b>Extinct in the Wild (EW)</b>	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.
<b>Critically Endangered (CR)</b>	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V), and it is therefore considered to be facing an extremely high risk of extinction in the wild.
<b>Endangered (EN)</b>	A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a very high risk of extinction in the wild.
<b>Vulnerable (VU)</b>	A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild.
<b>Near Threatened (NT)</b>	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.
<b>Least Concern (LTC)</b>	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.
<b>Data Deficient (DD)</b>	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.
<b>Not Evaluated (NE)</b>	A taxon is Not Evaluated when it has not yet been evaluated against the criteria.



**Environment Protection and Biodiversity Conservation Act 1999**

Category	Definition
<b>Threatened Flora Species</b>	
<b>Extinct (EX)</b>	A native species is eligible to be included in the Extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
<b>Extinct in the Wild (EW)</b>	A native species is eligible to be included in the Extinct in the Wild category at a particular time if, at that time: <ul style="list-style-type: none"> <li>(a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or</li> <li>(b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.</li> </ul>
<b>Critically Endangered (CR)</b>	A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
<b>Endangered (EN)</b>	A native species is eligible to be included in the endangered category at a particular time if, at that time: <ul style="list-style-type: none"> <li>(a) it is not critically endangered; and</li> <li>(b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.</li> </ul>
<b>Vulnerable (VU)</b>	A native species is eligible to be included in the vulnerable category at a particular time if, at that time: <ul style="list-style-type: none"> <li>(a) it is not critically endangered or endangered; and</li> <li>(b) it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.</li> </ul>
<b>Conservation Dependent (CD)</b>	A native species is eligible to be included in the Conservation Dependent category at a particular time if, at that time: <ul style="list-style-type: none"> <li>(a) 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; or</li> <li>(b) the following subparagraphs are satisfied: <ul style="list-style-type: none"> <li>(i) the species is a species of fish;</li> <li>(ii) the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;</li> <li>(iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory;</li> <li>(iv) cessation of the plan of management would adversely affect the conservation status of the species.</li> </ul> </li> </ul>



Category	Definition
<b>Threatened Ecological Communities</b>	
<b>Critically Endangered</b>	An ecological community is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
<b>Endangered</b>	An ecological community is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
<b>Vulnerable</b>	An ecological community is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered nor endangered; and (b) it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

### **Biodiversity Conservation Act 2016**

Category	Definition
<b>Threatened Flora Species</b>	
<b>Critically Endangered (CR)</b>	Threatened species considered to be “facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines”. Published under schedule 1 of the <i>Wildlife Conservation (Rare Flora) Notice 2018</i> for critically endangered flora.
<b>Endangered (EN)</b>	Threatened species considered to be “facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines”. Published under schedule 2 of the <i>Wildlife Conservation (Rare Flora) Notice 2018</i> for endangered flora.
<b>Vulnerable (VU)</b>	Threatened species considered to be “facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines”. Published under schedule 3 of the <i>Wildlife Conservation (Rare Flora) Notice 2018</i> for vulnerable flora.
<b>Extinct (EX)</b>	Species where “there is no reasonable doubt that the last member of the species has died”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act). Published as presumed extinct under schedule 4 of the <i>Wildlife Conservation (Rare Flora) Notice 2018</i> for extinct flora.
<b>Extinct in the Wild (EW)</b>	Species that “is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act). Currently there are no threatened flora species listed as extinct in the wild.



Category	Definition
<b>Threatened Ecological Communities</b>	
<b>Critically Endangered (CR)</b>	<p>An ecological community is eligible for listing in the category of critically endangered ecological community at a particular time if, at that time —</p> <p>(a) it is facing an extremely high risk of becoming eligible for listing as a collapsed ecological community in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines; and</p> <p>(b) listing in that category is otherwise in accordance with the ministerial guidelines.</p>
<b>Endangered (EN)</b>	<p>An ecological community is eligible for listing in the category of endangered ecological community at a particular time if, at that time —</p> <p>(a) it is not a critically endangered ecological community; and</p> <p>(b) it is facing a very high risk of becoming eligible for listing as a collapsed ecological community in the near future, as determined in accordance with criteria set out in the ministerial guidelines; and</p> <p>(c) listing in that category is otherwise in accordance with the ministerial guidelines.</p>
<b>Vulnerable (VU)</b>	<p>An ecological community is eligible for listing in the category of vulnerable ecological community at a particular time if, at that time —</p> <p>(a) it is not a critically endangered ecological community or an endangered ecological community; and</p> <p>(b) it is facing a high risk of becoming eligible for listing as a collapsed ecological community in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines; and</p> <p>(c) listing in that category is otherwise in accordance with the ministerial guidelines.</p>
<b>Collapsed</b>	<p>An ecological community is eligible for listing as a collapsed ecological community at a particular time if, at that time —</p> <p>(a) there is no reasonable doubt that the last occurrence of the ecological community has collapsed; or</p> <p>(b) the ecological community has been so extensively modified throughout its range that no occurrence of it is likely to recover —</p> <p>(i) its species composition or structure; or</p> <p>(ii) its species composition and structure.</p>



**Department of Biodiversity, Conservation and Attractions Priority Definitions**

Category	Definition
<b>Priority Flora Species</b>	
<b>Priority 1 (P1)</b>	<p><b>Poorly-known Species</b></p> <p>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.</p>
<b>Priority 2 (P2)</b>	<p><b>Poorly-known Species</b></p> <p>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.</p>
<b>Priority 3 (P3)</b>	<p><b>Poorly-known Species</b></p> <p>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.</p>
<b>Priority 4 (P4)</b>	<p><b>Rare, Near Threatened and other species in need of monitoring</b></p> <p>(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.</p> <p>(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.</p> <p>(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>



Category	Definition
<b>Priority Ecological Communities</b>	
<b>Priority 1 (P1)</b>	<p><b>Poorly-known ecological communities</b></p> <p>Ecological communities that are known from very few occurrences with a very restricted distribution (generally <math>\leq 5</math> occurrences or a total area of <math>\leq 100</math>ha). Occurrences are believed to be under threat either due to limited extent or being on lands under immediate threat (e.g., within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.</p>
<b>Priority 2 (P2)</b>	<p><b>Poorly-known Ecological Communities</b></p> <p>Communities that are known from few occurrences with a restricted distribution (generally <math>\leq 10</math> occurrences or a total area of <math>\leq 200</math>ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.</p>
<b>Priority 3 (P3)</b>	<p><b>Poorly-known Ecological Communities</b></p> <p>(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:</p> <p>(ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or;</p> <p>(iii) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.</p> <p>Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.</p>

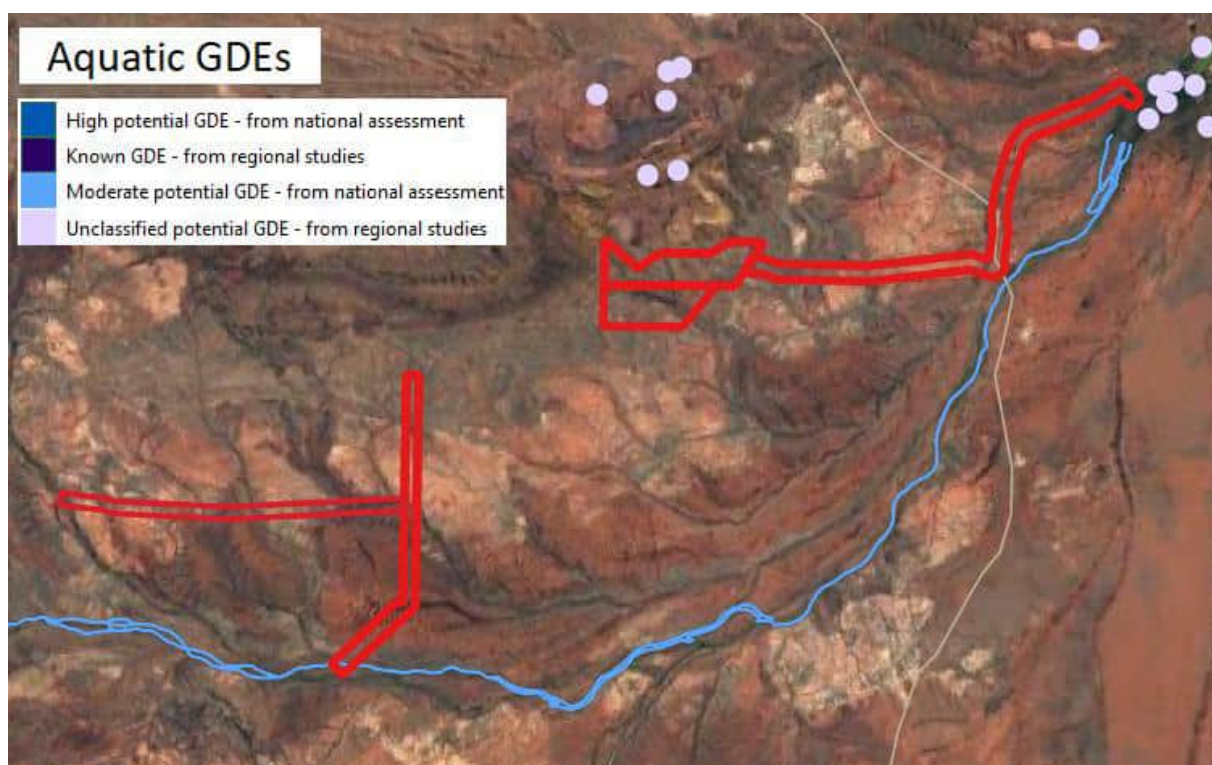
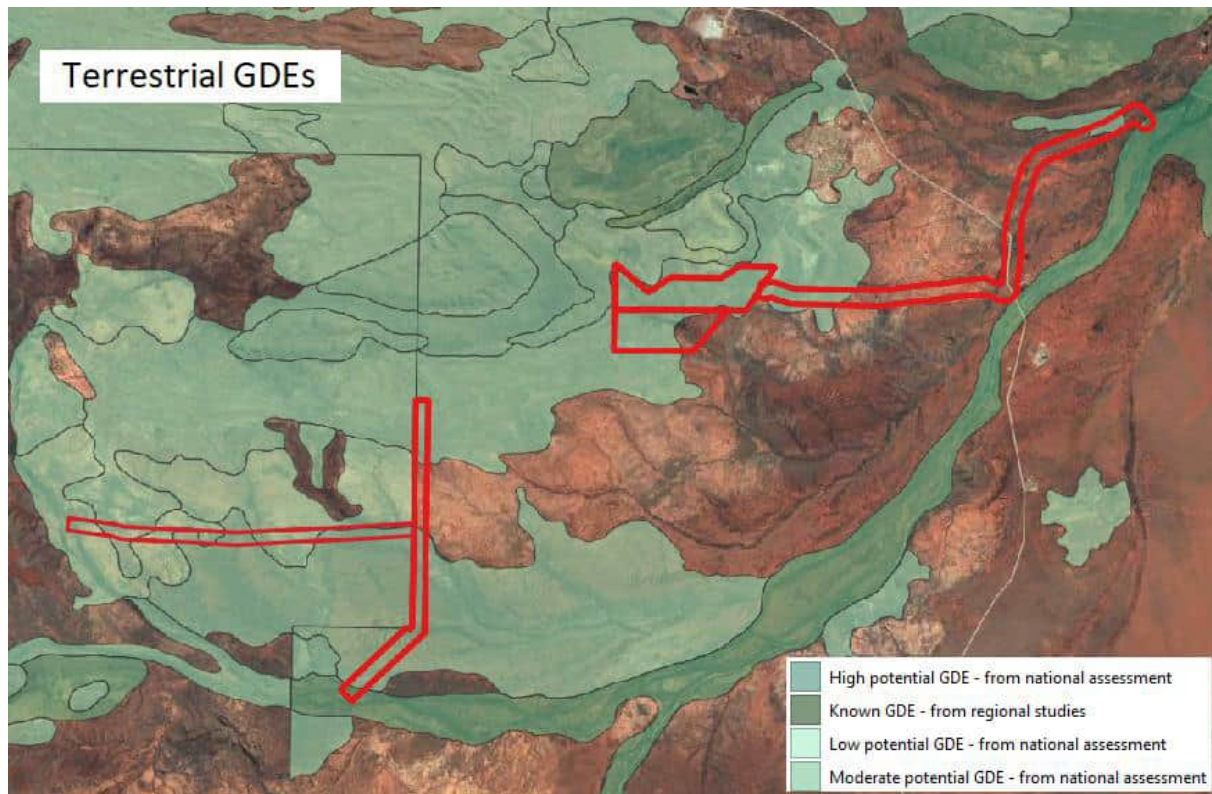


Category	Definition
Priority 4 (P4)	<p><b>Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.</b></p> <p>(i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These communities are usually represented on conservation lands.</p> <p>(ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category.</p> <p>(iii) Ecological communities that have been removed from the list of threatened communities during the past five years.</p>
Priority 5 (P5)	<p><b>Conservation Dependent ecological communities.</b></p> <p>Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.</p>

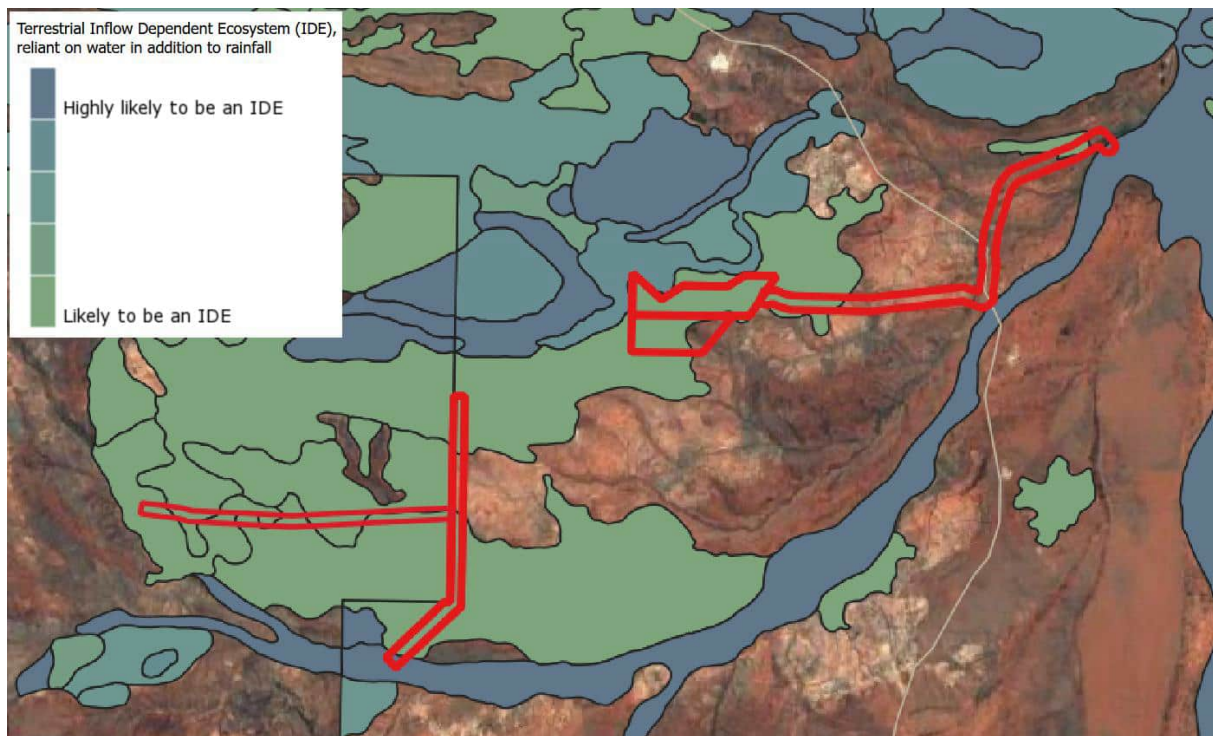


## **Appendix B: GDE Atlas Assessment Output (BoM, 2021)**











## Appendix C: Sample Site Data



**Western Ridge Pipeline**

**Site WRP-001**

**Date** 24/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
789769 mE; 7415446 mN  
119.8339 E -23.345002 S

**Veg Condition** Poor

**Soil** Light Medium Clay

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Major Drainage Line

**Vegetation** *Eucalyptus camaldulensis* subsp. *refulgens* and *Eucalyptus victrix* low open woodland over *Marsilea hirsuta* low sparse herbland.



**SPECIES LIST**

**Name**

*Alternanthera angustifolia*  
*\*Echinochloa colona*  
*Eragrostis elongata*  
*Eucalyptus camaldulensis* subsp. *refulgens*  
*Eucalyptus victrix*  
*Goodenia lamprosperma*  
*Marsilea hirsuta*  
*Schoenoplectiella dissachantha*  
*Sesbania cannabina*

**Specimen**

WRP001.03  
WRP001.04  
WRP001.02

WRP001.01



**Western Ridge Pipeline**

**Site WRP-002**

**Date** 24/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 789512 mE; 7415307 mN  
 119.8314 E -23.346307 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain



**Vegetation** *Triodia pungens* low open hummock grassland with *Eucalyptus victrix* low scattered trees over *Acacia synchronicia* mid scattered shrubs.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia synchronicia*  
*Codonocarpus cotinifolius*  
*Eremophila cuneifolia*  
*Eucalyptus victrix*  
*Evolvulus alsinoides* var. *decumbens*  
*Gomphrena canescens*  
*Hakea lorea* subsp. *lorea*  
*Paraneurachne muelleri*  
*Ptilotus clementii*  
*Rhynchosia minima*  
*Salsola australis*  
*Sida fibulifera*  
*Solanum lasiophyllum*  
*Triodia pungens*



**Western Ridge Pipeline**

**Site WRP-003**

**Date** 24/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 788636 mE; 7414901 mN  
 119.8230 E -23.350118 S  
**Veg Condition** Very Good  
**Soil** Silty Loam  
**Rock Type** Limestone  
**Fire Age** Moderate (3 to 5 yr)  
**Habitat** Calcrete Plain  
**Vegetation** *Triodia pungens* low open hummock grassland with *Eucalyptus socialis* subsp. *eucentrica* low scattered trees over fire ephemeral and herbs.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia bivenosa*  
*Codonocarpus cotinifolius*  
*Eucalyptus socialis* subsp. *eucentrica*  
*Indigofera monophylla*  
*Ptilotus clementii*  
*Ptilotus exaltatus*  
*Senna artemisioides* subsp. *oligophylla*  
*Tribulus hirsutus*  
*Triodia pungens*

WRP003.01  
 WRP003.02



## Western Ridge Pipeline

Site WRP-019

**Date** 26/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
787959 mE; 7414564 mN  
119.8164 E -23.353281 S

**Veg Condition** Good

**Soil** Clay Loam

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Drainage Area/ Floodplain

**Vegetation** Tall *Acacia incurvaneura* shrubland over *Hakea lorea* subsp. *lorea* with *Abutilon macrum* over dense *\*Cenchrus ciliaris* tussock grassland.



## SPECIES LIST

### Name

*Abutilon macrum*  
*Abutilon otocarpum*  
*Acacia incurvaneura*  
*Acacia tetragonophylla*  
*\*Cenchrus ciliaris*  
*Digitaria ctenantha*  
*Enneapogon polyphyllus*  
*Eremophila ?forrestii*  
*Eremophila latrobei*  
*Evolvulus alsinoides*  
*Gomphrena canescens*  
*Goodenia muelleriana*  
*Ipomoea calobra*  
*\*Malvastrum americanum*  
*Portulaca oleracea*  
*Ptilotus exaltatus*  
*Sida fibulifera*  
*Solanum lasiophyllum*  
*Sporobolus australasicus*

### Specimen

WRP019.05  
WRP019.06  
WRP019.01  
  
WRP019.03  
WRP019.04  
WRP019.02  
  
WRP019.07



**Western Ridge Pipeline**

**Site WRP-020**

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 789272 mE; 7415678 mN  
 119.8290 E -23.343002 S  
**Veg Condition** Very Good  
**Soil** Silty Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Triodia vanleeuwenii* and *Triodia pungens* low hummock grassland with *Acacia pruinocarpa*, *Hakea lorea* subsp. *lorea* and *Acacia pachyacra* tall sparse shrubland over *Senna artemisioides* subsp. *helmsii*, *Acacia sibirica* and *Senna glutinosa* subsp. *x luerssenii* mid to low scattered shrubs.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia pachyacra*  
*Acacia pruinocarpa*  
*Acacia sibirica*  
 \**Cenchrus ciliaris*  
*Hakea lorea* subsp. *lorea*  
*Senna glutinosa* subsp. *x luerssenii*  
*Triodia pungens*  
*Triodia vanleeuwenii*

WRP020.01



## Western Ridge Pipeline

## Site WRP-021

**Date** 26/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
787848 mE; 7414910 mN  
119.8153 E -23.350183 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain  
**Vegetation** Tall *Acacia sibirica* shrubs over low open *Triodia pungens* hummock grassland.



## SPECIES LIST

### Name

*Abutilon macrum*  
*Acacia bivenosa*  
*Acacia sibirica*  
*Acacia synchronicia*  
*\*Bidens bipinnata*  
*Duperreya commixta*  
*Enneapogon polyphyllus*  
*Evolvulus alsinoides*  
*Goodenia microptera*  
*Indigofera monophylla*  
*Portulaca filifolia*  
*Ptilotus exaltatus*  
*Senna glutinosa* subsp. x *luerksenii*  
*Triodia pungens*

### Specimen

WRP019.05  
WRP021.01



## Western Ridge Pipeline

Site WRP-022

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
789089 mE; 7415603 mN  
119.8273 E -23.343709 S

**Veg Condition** Good

**Soil** Clay Loam

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Drainage Area/ Floodplain

**Vegetation** *Corymbia candida* subsp. *dipsodes* low open woodland over \**Cenchrus ciliaris*, *Chrysopogon fallax* and *Eriachne flaccida* mid to low open tussock grassland with *Acacia aptaneura* mid to tall scattered shrubs.



## SPECIES LIST

### Name

*Acacia sclerosperma* subsp. *sclerosperma*  
\**Cenchrus ciliaris*  
*Chrysopogon fallax*  
*Corymbia candida* subsp. *dipsodes*  
\**Cynodon dactylon*  
*Dichanthium sericeum* subsp. *humilius*  
\**Echinochloa colona*  
*Eragrostis tenellula*  
*Eriachne flaccida*  
*Rhynchosia minima*  
*Sesbania cannabina*

### Specimen

WRP001.04

WRP022.01



**Western Ridge Pipeline**

**Site WRP-023**

**Date** 26/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
 786723 mE; 7414203 mN  
 119.8044 E -23.356755 S

**Veg Condition** Very Good

**Soil** Clay Loam

**Rock Type** BIF

**Fire Age** Old (6+ yr)

**Habitat** Stony Plain

**Vegetation** Tall open *Acacia incurvaneura* with *Corymbia hamersleyana* over *Abutilon macrum* and *Abutilon otocarpum* over low open *Triodia pungens* and *Triodia vanleeuwenii* hummock grassland



**SPECIES LIST**

**Name**

*Abutilon macrum*  
*Abutilon otocarpum*  
*Acacia ?adsurgens*  
*Acacia ancistrocarpa*  
*Acacia incurvaneura*  
*Aristida contorta*  
*\*Cenchrus ciliaris*  
*Corymbia hamersleyana*  
*Evolvulus alsinoides*  
*Gomphrena canescens*  
*Goodenia microptera*  
*Goodenia muelleriana*  
*Hakea lorea* subsp. *lorea*  
*Indigofera monophylla*  
*Paraneurachne muelleri*  
*Ptilotus astrolasius*  
*Ptilotus calostachyus*  
*Senna artemisioides* subsp. *oligophylla*  
*Senna glutinosa* subsp. *x luerksenii*  
*Tribulus suberosus*  
*Triodia vanleeuwenii*

**Specimen**

WRP019.05  
 WRP019.06  
 WRP023.01  
 WRP019.01



**Western Ridge Pipeline**

**Site WRP-024**

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 788642 mE; 7415338 mN  
 119.8229 E -23.346182 S  
**Veg Condition** Very Good  
**Soil** Silty Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Hillslope



**Vegetation** *Triodia vanleeuwenii* low hummock grassland with *Acacia bivenosa*, *Acacia tetragonophylla* and *Acacia pruinocarpa* tall scattered shrubs with *Eucalyptus leucophloia* subsp. *leucophloia* low scattered trees.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia bivenosa*  
*Acacia catenulata* subsp. *occidentalis*  
*Acacia tetragonophylla*  
*Eucalyptus leucophloia* subsp. *leucophloia*  
*Indigofera monophylla*  
*Ptilotus calostachyus*  
*Ptilotus rotundifolius*  
*Triodia vanleeuwenii*



**Western Ridge Pipeline**

**Site WRP-025**

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 786081 mE; 7413685 mN  
 119.7982 E -23.361546 S

**Veg Condition** Poor

**Soil** Silty Loam

**Rock Type** Conglomerate

**Fire Age** Old (6+ yr)

**Habitat** Stony Plain

**Vegetation** *Acacia ?adsurgens* tall open woodland with isolated low *Corymbia hamersleyana* trees over patches of *\*Cenchrus ciliaris*, *Enneapogon polyphyllus* and *Aristida contorta* low tussock grassland with scattered low shrubs.



**SPECIES LIST**

**Name**

*Abutilon macrum*  
*Acacia ?adsurgens*  
*Arivela viscosa*  
*\*Bidens bipinnata*  
*\*Cenchrus ciliaris*  
*Crotalaria medicaginea* var. *neglecta*  
*Enneapogon polyphyllus*  
*Goodenia muelleriana*  
*Ipomoea muelleri*  
*Iseilema eremaeum*  
*Kennedia prorepens*  
*Senna artemisioides* subsp. *oligophylla*  
*Sida platycalyx*  
*Sporobolus australasicus*  
*Themeda triandra*  
*Trichodesma zeylanicum* var. *zeylanicum*

**Specimen**

WRP023.01



**Western Ridge Pipeline**

**Site WRP-026**

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 787379 mE; 7414722 mN  
 119.8107 E -23.351962 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Hillslope



**Vegetation** *Triodia vanleeuwenii* low hummock grassland with *Acacia bivenosa*, *Hakea lorea* subsp. *lorea* and *Senna glutinosa* subsp. *pruinosa* mid to tall sparse shrubland with occasional *Eucalyptus leucophloia* subsp. *leucophloia* low trees.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia bivenosa*  
*Acacia hilliana*  
*Acacia inaequilatera*  
*Aristida holathera* var. *holathera*  
*Hakea lorea* subsp. *lorea*  
*Ptilotus astrolasius*  
*Ptilotus calostachyus*  
*Senna glutinosa* subsp. *pruinosa*  
*Senna glutinosa* subsp. x *luerssenii*  
*Triodia vanleeuwenii*



**Western Ridge Pipeline**

**Site WRP-027**

**Date** 26/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
 785585 mE; 7413225 mN  
 119.7935 E -23.365776 S

**Veg Condition** Degraded

**Soil** Clay Loam

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Drainage Area/ Floodplain

**Vegetation** Closed \**Cenchrus ciliaris* grassland with scattered tall *Corymbia hamersleyana* with low scattered *Acacia citrinoviridis* and *Acacia incurvaneura*.



**SPECIES LIST**

**Name**

*Acacia citrinoviridis*  
*Acacia incurvaneura*  
 \**Bidens bipinnata*  
*Boerhavia coccinea*  
 \**Cenchrus ciliaris*  
 \**Cenchrus setiger*  
*Chrysopogon fallax*  
*Corymbia hamersleyana*  
*Crotalaria medicaginea* var. *neglecta*  
*Enteropogon ramosus*  
*Eremophila longifolia*  
*Evolvulus alsinoides*  
*Gomphrena canescens*  
*Hakea lorea* subsp. *lorea*  
*Indigofera linifolia*  
 \**Malvastrum americanum*  
*Pterocaulon sphacelatum*  
*Salsola australis*  
*Themeda triandra*

**Specimen**

WRP019.01



**Western Ridge Pipeline**

**Site WRP-028**

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 786410 mE; 7414410 mN  
 119.8013 E -23.354946 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Hillslope



**Vegetation** *Triodia wiseana* low hummock grassland with *Acacia catenulata* subsp. *occidentalis*, *Acacia bivenosa* and *Acacia tetragonophylla* mid to tall sparse shrubland over *Eremophila cuneifolia* low scattered shrubs with *Eucalyptus leucophloia* subsp. *leucophloia* low scattered trees.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia bivenosa*  
*Acacia catenulata* subsp. *occidentalis*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Eremophila cuneifolia*  
*Eriachne pulchella* subsp. *pulchella*  
*Eucalyptus leucophloia* subsp. *leucophloia*  
*Senna glutinosa* subsp. *x. luerksenii*  
*Tribulus suberosus*  
*Triodia wiseana*



## Western Ridge Pipeline

Site WRP-029

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
785699 mE; 7413147 mN  
119.7946 E -23.366465 S

**Veg Condition** Degraded

**Soil** Clayey Sand

**Rock Type** Dolerite

**Fire Age** Old (6+ yr)

**Habitat** Medium Drainage Line

**Vegetation** *Eucalyptus victrix* and *Acacia citrinoviridis* low to mid open woodland over low \**Cenchrus ciliaris* tussock grassland.



## SPECIES LIST

### Name

*Acacia citrinoviridis*  
*Alternanthera angustifolia*  
*\*Bidens bipinnata*  
*\*Cenchrus ciliaris*  
*\*Cenchrus setiger*  
*\*Echinochloa colona*  
*Eragrostis tenellula*  
*Eucalyptus victrix*  
*Eulalia aurea*  
*Goodenia lamprosperma*  
*\*Malvastrum americanum*  
*Phyllanthus maderaspatensis*  
*Sesbania cannabina*  
*\*Setaria verticillata*  
*Triodia pungens*

### Specimen

WRP001.03

WRP001.04



**Western Ridge Pipeline**

**Site WRP-030**

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 785326 mE; 7412247 mN  
 119.7911 E -23.374648 S

**Veg Condition** Very Good

**Soil** Clay Loam

**Rock Type** Limestone

**Fire Age** Moderate (3 to 5 yr)

**Habitat** Sandy/ Stony Plain

**Vegetation** *Triodia angusta* low hummock grassland with *Acacia pachyacra*, *Melaleuca eleuterostachya* and *Senna artemisioides* subsp. *oligophylla* mid to low scattered shrubs.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia pachyacra*  
*Acacia sclerosperma* subsp. *sclerosperma*  
 \**Cenchrus ciliaris*  
*Codonocarpus cotinifolius*  
*Melaleuca eleuterostachya*  
*Ptilotus exaltatus*  
*Salsola australis*  
*Senna artemisioides* subsp. *oligophylla*  
*Stylobasium spathulatum*  
*Triodia angusta*



## Western Ridge Pipeline

Site WRP-031

**Date** 26/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone 50  
785561 mE; 7412230 mN  
119.7934 E -23.374761 S

**Veg Condition** Degraded

**Soil** Light Clay

**Rock Type** Limestone

**Fire Age** Old (6+ yr)

**Habitat** Calcrete Plain

**Vegetation** Scattered *Acacia incurvaneura* and *Corymbia hamersleyana* trees over low *Aerva javanica*, *Cenchrus setiger* and *Cenchrus ciliaris* shrubland and tussock grassland.



## SPECIES LIST

### Name

*Acacia incurvaneura*  
*Acacia sclerosperma* subsp. *sclerosperma*  
*Aerva javanica*  
*Arivela viscosa*  
*Boerhavia coccinea*  
*Cenchrus ciliaris*  
*Cenchrus setiger*  
*Corymbia hamersleyana*  
*Duperreya commixta*  
*Enneapogon polyphyllus*  
*Gomphrena canescens*  
*Malvastrum americanum*  
*Ptilotus exaltatus*  
*Rhagodia eremaea*  
*Senna artemisioides* subsp. *oligophylla*  
*Sida fibulifera*  
*Solanum lasiophyllum*  
*Tephrosia* sp. Newman (A.A. Mitchell PRP 29)

### Specimen

WRP019.01

WRP019.04

WRP031.01



**Western Ridge Pipeline**

**Site WRP-032**

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 785362 mE; 7411904 mN  
 119.7915 E -23.377739 S

**Veg Condition** Good

**Soil** Medium Clay

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Wetland

**Vegetation** *Eucalyptus camaldulensis* subsp. *refulgens* low woodland over *Marsilea hirsuta* herbland and *Eleocharis pallens* scattered sedges.



**SPECIES LIST**

**Name**

*Eleocharis pallens*  
*Eucalyptus camaldulensis* subsp. *refulgens*  
*Marsilea hirsuta*

**Specimen**

WRP032.02  
 WRP032.01



## Western Ridge Pipeline

Site WRP-033

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
785359 mE; 7410145 mN  
119.7918 E -23.393608 S

**Veg Condition** Good

**Soil** Clay Loam

**Rock Type** BIF

**Fire Age** Old (6+ yr)

**Habitat** Stony Plain

**Vegetation** Patches of *Acacia paraneura*, *Acacia synchronicia* mid to tall sparse shrubland over *Senna artemisioides* subsp. *oligophylla*, *Rhagodia eremaea* and *Eremophila cuneifolia* low scattered shrubs over patches of *Aristida contorta* and \**Cenchrus ciliaris* low open tussock grassland.



## SPECIES LIST

### Name

### Specimen

*Acacia paraneura*  
*Acacia synchronicia*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Arivela viscosa*  
\**Cenchrus ciliaris*  
*Eragrostis xerophila*  
*Eremophila cuneifolia*  
*Eremophila lachnocalyx*  
*Hakea preissii*  
*Heliotropium tenuifolium*  
*Portulaca filifolia*  
*Portulaca oleracea*  
*Senna artemisioides* subsp. *helmsii*  
*Senna artemisioides* subsp. *oligophylla*  
*Sporobolus australasicus*  
*Tephrosia* sp. Newman (A.A. Mitchell PRP 29)

WRP033.01

WRP010.03

**Western Ridge Pipeline**

**Site WRP-034**

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 785220 mE; 7411167 mN  
 119.7903 E -23.384411 S  
**Veg Condition** Very Good  
**Soil** Loamy Sand  
**Rock Type** None Discernible  
**Fire Age** Old (6+ yr)  
**Habitat** Sand Plain



**Vegetation** *Triodia pungens* low hummock grassland with *Acacia sclerosperma* subsp. *sclerosperma*, *Acacia dictyophleba* and *Acacia tetragonophylla* mid to tall scattered shrubs over *Ptilotus astrolasius* scattered low shrubs.

**SPECIES LIST**

**Name**

**Specimen**

<i>Acacia paraneura</i>			
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>			
<i>Acacia synchronicia</i>			
<i>Acacia tetragonophylla</i>			
* <i>Cenchrus ciliaris</i>			
<i>Chrysocephalum</i>	<i>apiculatum</i>	subsp.	<i>pilbarensis</i>
<i>Codonocarpus cotinifolius</i>			
<i>Goodenia microptera</i>			
<i>Goodenia muelleriana</i>			
<i>Pterocaulon sphacelatum</i>			
<i>Ptilotus astrolasius</i>			
<i>Tribulus astrocarpus</i>			
<i>Triodia pungens</i>			



## Western Ridge Pipeline

Site WRP-035

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
784571 mE; 7409658 mN  
119.7842 E -23.398136 S  
**Veg Condition** Very Good  
**Soil** Loamy Sand  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Sand Plain



**Vegetation** *Acacia sclerosperma* subsp. *sclerosperma*, *Acacia tetragonophylla* and *Acacia pruinocarpa* tall to mid sparse shrubland over *Aristida holathera* var. *holathera*, *Eragrostis xerophila* and *Aristida contorta* low open tussock grassland with *Triodia pungens* low scattered hummock grasses and *Corymbia candida* subsp. *dipsodes* low scattered trees.

## SPECIES LIST

### Name

### Specimen

*Acacia sclerosperma* subsp. *sclerosperma*  
*Aristida contorta*  
*Aristida holathera* var. *holathera*  
*Aristida inaequiglumis*  
*Corchorus parviflorus*  
*Corymbia candida* subsp. *dipsodes*  
*Eragrostis xerophila*  
*Eucalyptus xerothermica*  
*Fimbristylis dichotoma*  
*Goodenia vilmorinae*  
*Paraneurachne muelleri*  
*Ptilotus helipteroides*  
*Stemodia viscosa*  
*Triodia pungens*

WRP005.01

WRP005.02

**Western Ridge Pipeline**

**Site WRP-036**

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 784853 mE; 7409688 mN  
 119.7870 E -23.397816 S  
**Veg Condition** Degraded  
**Soil** Clay Loam  
**Rock Type** None Discernible  
**Fire Age** Old (6+ yr)  
**Habitat** Drainage Area/ Floodplain



**Vegetation** *Acacia aptaneura*, *Corymbia candida* subsp. *dipsodes* low woodland over *Acacia sclerosperma* subsp. *sclerosperma* tall sparse shrubland over *\*Echinochloa colona* low open tussock grassland over herbs dominated by *Marsilea hirsuta*.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia aptaneura*  
*Acacia sclerosperma* subsp. *sclerosperma*  
*Alternanthera angustifolia*  
*Corymbia candida* subsp. *dipsodes*  
*\*Echinochloa colona*  
*Marsilea hirsuta*

WRP001.03

WRP001.04



## Western Ridge Pipeline

Site WRP-037

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
783981 mE; 7409974 mN  
119.7784 E -23.395388 S  
**Veg Condition** Excellent  
**Soil** Clay Loam  
**Rock Type** Granite  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain



**Vegetation** *Acacia aptaneura*, *Eremophila fraseri* subsp. *fraseri* and *Acacia tetragonophylla* mid to tall open shrubland over *Aristida contorta* and *Enneapogon polyphyllus* low sparse tussock grassland with scattered *Corymbia candida* subsp. *dipsodes* low trees.

## SPECIES LIST

### Name

*Acacia aptaneura*  
*Aristida contorta*  
*Arivela viscosa*  
*Chrysopogon fallax*  
*Corymbia candida* subsp. *dipsodes*  
*Enneapogon polyphyllus*  
*Eremophila fraseri* subsp. *fraseri*  
*Ptilotus helipteroides*  
*Ptilotus obovatus* var. *obovatus*  
*Senna artemisioides* subsp. *helmsii*  
*Sida platycalyx*

### Specimen

WRP037.01

WRP019.04

**Western Ridge Pipeline**

**Site WRP-038**

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 782653 mE; 7409701 mN  
 119.7655 E -23.398083 S  
**Veg Condition** Excellent  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain  
**Vegetation** *Acacia synchronicia*, *Acacia tetragonophylla* and *Senna glutinosa* subsp. x *luerssenii* mid to tall sparse shrubland over *Senna* sp. Meekatharra (E. Bailey 1-26) low scattered shrubs over *Aristida contorta* low scattered tussock grasses.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia synchronicia*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Enneapogon polyphyllus*  
*Portulaca filifolia*  
*Sclerolaena eriacantha*  
*Senna glutinosa* subsp. x *luerssenii*  
*Senna* sp. Meekatharra (E. Bailey 1-26)

WRP038.01  
 WRP038.02



## Western Ridge Pipeline

Site WRP-039

**Date** 26/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone 50  
783501 mE; 7409598 mN  
119.7738 E -23.398870 S

**Veg Condition** Degraded

**Soil** Clay Loam

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Sand Plain

**Vegetation** Open scattered *Acacia macraneura* over open mixed shrubland of *Arivela viscosa* and *Senna* sp. Meekatharra (E. Bailey 1-26) over *Boerhavia coccinea* and *Enneapogon polyphyllus*.



## SPECIES LIST

### Name

*Abutilon macrum*  
*Acacia macraneura*  
*Acacia tetragonophylla*  
*Arivela viscosa*  
*Boerhavia coccinea*  
*Chrysopogon fallax*  
*Dactyloctenium radulans*  
*Dichanthium sericeum* subsp. *humilius*  
*Enneapogon polyphyllus*  
*Enteropogon ramosus*  
*Evolvulus alsinoides*  
*Gomphrena canescens*  
*\*Malvastrum americanum*  
*Portulaca cyclophylla*  
*Portulaca filifolia*  
*Ptilotus obovatus* var. *obovatus*  
*Senna artemisioides* subsp. *helmsii*  
*Senna* sp. Meekatharra (E. Bailey 1-26)  
*Sida fibulifera*  
*Trianthema triquetrum*

### Specimen

WRP019.05  
WRP039.01  
  
WRP019.04  
WRP039.02  
  
MvW.01  
  
WRP038.02

**Western Ridge Pipeline**

**Site WRP-040**

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 782235 mE; 7409542 mN  
 119.7614 E -23.399594 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain



**Vegetation** *Acacia synchronicia*, *Acacia paraneura* and *Acacia tetragonophylla* mid to tall sparse shrubland over *Senna* sp. Meekatharra (E. Bailey 1-36) low scattered shrubs over *Sclerolaena cuneata*, *Sclerolaena lanicuspis* and *Salsola australis* low chenopod scattered shrubs.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia synchronicia*  
*Boerhavia coccinea*  
*\*Cenchrus ciliaris*  
*Dactyloctenium radulans*  
*Sclerolaena bicornis*  
*Sclerolaena cuneata*  
*Sclerolaena lanicuspis*  
*Senna* sp. Meekatharra (E. Bailey 1-26)  
*Trianthema triquetrum*

WRP040.02

WRP040.01



## Western Ridge Pipeline

Site WRP-041

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
781215 mE; 7409371 mN  
119.7515 E -23.401308 S

**Veg Condition** Degraded

**Soil** Clay Loam

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Minor Drainage Line

**Vegetation** \**Cenchrus ciliaris* and *Chrysopogon fallax* mid tussock grassland with *Acacia paraneura*, *Eremophila longifolia* and *Acacia tetragonophylla* mid to tall sparse shrubland with *Eucalyptus xerothermica* low scattered trees.



## SPECIES LIST

### Name

*Abutilon fraseri* subsp. *fraseri*  
*Acacia paraneura*  
*Acacia tetragonophylla*  
\*Aerva javanica  
*Aristida holathera* var. *holathera*  
\*Cenchrus ciliaris  
*Chloris* sp. Indet  
*Cucumis variabilis*  
*Dactyloctenium radulans*  
*Duperreya commixta*  
*Eremophila longifolia*  
*Eucalyptus xerothermica*  
*Hakea lorea* subsp. *lorea*  
\**Malvastrum americanum*  
*Neptunia dimorphantha*  
*Ptilotus obovatus* var. *obovatus*  
*Rhynchosia minima*  
*Salsola australis*  
*Santalum lanceolatum*  
*Senna artemisioides* subsp. *oligophylla*  
*Sida fibulifera*

### Specimen

WRP041.01

**Western Ridge Pipeline**

**Site WRP-042**

**Date** 26/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 781565 mE; 7409658 mN  
 119.7549 E -23.398663 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Senna glutinosa* subsp. x *luerssenii* and *Senna* sp. Meekatharra (E. Bailey 1-36) mid open shrubland with *Acacia paraneura* and *Acacia pruinocarpa* tall scattered shrubs over scattered tussock and hummock grasses including *Triodia wiseana* and *Enneapogon caerulescens*.

**SPECIES LIST**

**Name**

*Acacia ?adsurgens*  
*Acacia paraneura*  
*Acacia tetragonophylla*  
 \**Cenchrus ciliaris*  
*Enneapogon caerulescens*  
*Eragrostis xerophila*  
*Eremophila forrestii* subsp. *forrestii*  
*Senna artemisioides* subsp. *oligophylla*  
*Senna glutinosa* subsp. x *luerssenii*  
*Triodia wiseana*

**Specimen**

WRP023.01



**Western Ridge Pipeline**

**Site WRP-043**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone 50  
 766330 mE; 7405984 mN  
 119.6066 E -23.434366 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Moderate (3 to 5 yr)  
**Habitat** Drainage Area/ Floodplain  
**Vegetation** *Triodia pungens* low hummock grassland with *Eriachne mucronata*, *Enneapogon polyphyllus* and *Themeda triandra* low sparse tussock grassland with *Acacia bivenosa*, *Eremophila longifolia* and *Acacia maitlandii* mid to tall scattered shrubs.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia bivenosa*  
*Acacia inaequilatera*  
*Acacia maitlandii*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Arivela viscosa*  
*Boerhavia coccinea*  
*Enneapogon polyphyllus*  
*Enteropogon ramosus*  
*Eremophila fraseri* subsp. *fraseri*  
*Eremophila longifolia*  
*Eriachne mucronata*  
*Evolvulus alsinoides* var. *decumbens*  
*Heliotropium tenuifolium*  
*Melhania oblongifolia*  
*Salsola australis*  
*Senna artemisioides* subsp. *oligophylla*  
*Themeda triandra*  
*Triodia pungens*

WRP043.01

**Western Ridge Pipeline**

**Site WRP-044**

**Date** 27/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone 50  
 766434 mE; 7405738 mN  
 119.6076 E -23.436571 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Drainage Area/ Floodplain  
**Vegetation** Open *Triodia pungens* hummock grassland with scattered *Acacia paraneura* and *Acacia bivenosa* shrubs



**SPECIES LIST**

**Name**

**Specimen**

*Abutilon fraseri* subsp. *fraseri*  
*Acacia bivenosa*  
*Acacia dictyophleba*  
*Acacia pachyacra*  
*Acacia paraneura*  
*Acacia synchronicia*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Chrysopogon fallax*  
*Enchylaena tomentosa* var. *tomentosa*  
*Eremophila forrestii* subsp. *forrestii*  
*Eremophila lachnocalyx*  
*Eremophila longifolia*  
*Hakea lorea* subsp. *lorea*  
*Heliotropium tenuifolium*  
*Senna artemisioides* subsp. *oligophylla*  
*Senna artemisioides* subsp. *x artemisioides*  
*Sida fibulifera*  
*Sporobolus australasicus*  
*Themeda triandra*  
*Triodia pungens*



**Western Ridge Pipeline**

**Site WRP-045**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone 50  
 766227 mE; 7405866 mN  
 119.6056 E -23.435450 S

**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Moderate (3 to 5 yr)  
**Habitat** Undulating Low Hills

**Vegetation** *Triodia wiseana* low open hummock grassland with *Acacia inaequilatera* mid to tall scattered shrubs over *Ptilotus rotundifolius* and *Senna artemisioides* subsp. *oligophylla* low scattered shrubs.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia inaequilatera*  
*Aristida contorta*  
*Eriachne pulchella* subsp. *pulchella*  
*Goodenia microptera*  
*Goodenia stobbsiana*  
*Heliotropium tanythrix*  
*Ptilotus astrolasius*  
*Ptilotus clementii*  
*Ptilotus polystachyus*  
*Ptilotus rotundifolius*  
*Senna artemisioides* subsp. *oligophylla*  
*Senna glutinosa* subsp. *pruinosa*  
*Tribulus hirsutus*  
*Triodia wiseana*

WRP045.02

WRP045.01

## Western Ridge Pipeline

Site WRP-046

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
766441 mE; 7405406 mN  
119.6077 E -23.439565 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain



**Vegetation** *Triodia pungens* and *Triodia wiseana* low open hummock grassland with *Acacia ?adsurgens*, *Eremophila fraseri* subsp. *fraseri* and *Acacia inaequilatera* mid to tall open shrubland over *Enneapogon polyphyllus* and *Aristida contorta* low scattered tussock grasses.

## SPECIES LIST

### Name

*Abutilon cunninghamii*  
*Acacia ?adsurgens*  
*Acacia inaequilatera*  
*Acacia paraneura*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Corchorus incanus* subsp. *lithophilus*  
*Enneapogon polyphyllus*  
*Eremophila fraseri* subsp. *fraseri*  
*Goodenia muelleriana*  
*Paraneurachne muelleri*  
*Pterocaulon sphacelatum*  
*Triodia pungens*  
*Triodia wiseana*

### Specimen

WRP006.01  
WRP046.01  
  
WRP046.02  
WRP019.04



**Western Ridge Pipeline**

**Site WRP-047**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766169 mE; 7405501 mN  
 119.6051 E -23.438750 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills



**Vegetation** *Triodia wiseana* low open hummock grassland with *Eremophila ?platycalyx*, *Senna glutinosa* subsp. *pruinosa* and *Ptilotus obovatus* var. *obovatus* mid to low sparse shrubland with *Acacia bivenosa* tall scattered shrubs with occasional *Eucalyptus leucophloia* subsp. *leucophloia* low trees.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia bivenosa*  
*Acacia tetragonophylla*  
*Eremophila ?platycalyx*  
*Eriachne mucronata*  
*Ptilotus obovatus* var. *obovatus*  
*Senna glutinosa* subsp. *pruinosa*  
*Senna glutinosa* subsp. x *luerssenii*  
*Tribulus suberosus*  
*Triodia wiseana*

WRP047.01

**Western Ridge Pipeline**

**Site WRP-048**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766352 mE; 7405041 mN  
 119.6069 E -23.442875 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Hillslope



**Vegetation** *Triodia angusta* and *Triodia wiseana* low to mid hummock grassland with *Acacia ?adsurgens*, *Acacia synchronicia* and *Acacia bivenosa* mid to tall sparse shrubland over *Eremophila cuneifolia* and *Ptilotus obovatus* var. *obovatus* low scattered shrubs.

**SPECIES LIST**

**Name**

*Acacia ?adsurgens*  
*Acacia bivenosa*  
*Acacia synchronicia*  
*Eremophila cuneifolia*  
*Eriachne mucronata*  
*Indigofera monophylla*  
*Ptilotus obovatus* var. *obovatus*  
*Scaevola spinescens*  
*Senna glutinosa* subsp. *pruinosa*  
*Senna glutinosa* subsp. x *luerssenii*  
*Triodia angusta*  
*Triodia wiseana*

**Specimen**

WRP046.01



**Western Ridge Pipeline**

**Site WRP-049**

**Date** 27/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766348 mE; 7405149 mN  
 119.6069 E -23.441898 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills  
**Vegetation** *Triodia angusta* low hummock grassland with low *Eriachne mucronata* tussock grasses, low *Ptilotus obovatus* var. *obovatus* shrubs and mid *Eremophila fraseri* subsp. *fraseri* and *Acacia paraneura* shrubs.



**SPECIES LIST**

**Name**

**Specimen**

*Abutilon fraseri* subsp. *fraseri*  
*Acacia tetragonophylla*  
*Corchorus incanus* subsp. *lithophilus*  
*Cucumis variabilis*  
*Eremophila lachnocalyx*  
*Eriachne mucronata*  
*Pterocaulon sphacelatum*  
*Ptilotus obovatus* var. *obovatus*  
*Rhynchosia minima*  
*Triodia angusta*  
*Triodia wiseana*

WRP046.02

**Western Ridge Pipeline**

**Site WRP-050**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766155 mE; 7405254 mN  
 119.6050 E -23.440986 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills



**Vegetation** *Triodia wiseana* low open hummock grassland with *Acacia paraneura* and *Eucalyptus gamophylla* low scattered trees over *Acacia paraneura*, *Acacia inaequilatera* and *Acacia bivenosa* tall scattered shrubs.

**SPECIES LIST**

**Name**

**Specimen**

*Abutilon fraseri* subsp. *fraseri*  
*Abutilon* sp. Indet  
*Acacia bivenosa*  
*Acacia inaequilatera*  
*Acacia paraneura*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Boerhavia coccinea*  
*Enneapogon polyphyllus*  
*Eremophila* ?*platycalyx*  
*Eucalyptus gamophylla*  
*Evolvulus alsinoides* var. *decumbens*  
*Indigofera monophylla*  
*Ptilotus astrolasius*  
*Ptilotus obovatus* var. *obovatus*  
*Ptilotus polystachyus*  
*Senna artemisioides* subsp. *oligophylla*  
*Triodia wiseana*

WRP047.01

WRP045.01



**Western Ridge Pipeline**

**Site WRP-051**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766267 mE; 7404816 mN  
 119.6061 E -23.444918 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Hillslope



**Vegetation** *Triodia vanleeuwenii* and *Triodia wiseana* low open hummock grassland with *Acacia ?adsurgens* and *Acacia inaequilatera* tall sparse shrubland over *Senna glutinosa* subsp. *x luerssenii* and *Eremophila fraseri* subsp. *fraseri* mid to low scattered shrubs.

**SPECIES LIST**

**Name**

*Acacia ?adsurgens*  
*Acacia inaequilatera*  
*Aristida contorta*  
*Duperreya commixta*  
*Eremophila fraseri* subsp. *fraseri*  
*Hakea lorea* subsp. *lorea*  
*Ptilotus obovatus* var. *obovatus*  
*Ptilotus polystachyus*  
*Senna glutinosa* subsp. *x luerssenii*  
*Triodia vanleeuwenii*  
*Triodia wiseana*

**Specimen**

WRP046.01

WRP045.01

**Western Ridge Pipeline**

**Site WRP-052**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766211 mE; 7404585 mN  
 119.6056 E -23.447011 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Shale  
**Fire Age** Old (6+ yr)  
**Habitat** Breakaway



**Vegetation** *Acacia pteraneura* low open woodland over *Senna glutinosa* subsp. x *luerssenii*, *Eremophila ?platycalyx* and *Ptilotus obovatus* var. *obovatus* mid to low scattered shrubs over *Enneapogon polyphyllus* scattered low tussock grasses.

**SPECIES LIST**

**Name**

*Acacia pteraneura*  
*Enneapogon polyphyllus*  
*Eremophila ?platycalyx*  
*Gomphrena canescens*  
*Hibiscus sturtii* var. *campylochlamys*  
*Ptilotus exaltatus*  
*Ptilotus obovatus* var. *obovatus*  
*Senna glutinosa* subsp. x *luerssenii*

**Specimen**

WRP019.04  
 WRP047.01  
 WRP005.03



**Western Ridge Pipeline**

**Site WRP-053**

**Date** 27/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766275 mE; 7404662 mN  
 119.6063 E -23.446306 S  
**Veg Condition** Excellent  
**Soil** Light Clay  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Hillcrest/ Upper Hillslope  
**Vegetation** Open *Triodia pungens* hummock grassland with emergent *Eremophila latrobei* shrubs.



**SPECIES LIST**

**Name**

**Specimen**

*Eremophila latrobei*  
*Eremophila platycalyx* subsp. *pardalota*  
*Eriachne mucronata*  
*Ptilotus obovatus* var. *obovatus*  
*Ptilotus polystachyus*  
*Senna glutinosa* subsp. x *luerssenii*  
*Triodia pungens*

**Western Ridge Pipeline**

**Site WRP-054**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766295 mE; 7404341 mN  
 119.6065 E -23.449198 S  
**Veg Condition** Very Good  
**Soil** Silty Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia paraneura* low open woodland over *Senna glutinosa* subsp. x *luerssenii*, *Senna artemisioides* subsp. x *artemisioides* and *Tribulus suberosus* mid to low sparse shrubland over isolated patches of *\*Cenchrus ciliaris*, *Aristida contorta* and *Enneapogon caerulescens* tussock grasses.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia paraneura*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*\*Cenchrus ciliaris*  
*Enneapogon caerulescens*  
*Enteropogon ramosus*  
*Eriachne mucronata*  
*Senna artemisioides* subsp. *helmsii*  
*Senna artemisioides* subsp. x *artemisioides*  
*Senna glutinosa* subsp. x *luerssenii*  
*Tribulus suberosus*



## Western Ridge Pipeline

Site WRP-055

**Date** 27/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
766102 mE; 7404255 mN  
119.6046 E -23.450005 S

**Veg Condition** Degraded

**Soil** Clay Loam

**Rock Type** Quartz

**Fire Age** Old (6+ yr)

**Habitat** Drainage Area/ Floodplain

**Vegetation** *Acacia paraneura* and *Acacia pteraneura* low woodland with *Acacia tetragonophylla* and *Acacia bivenosa* over *Senna artemisioides* subsp. *helmsii* and *Senna glutinosa* subsp. *x luerksenii* shrubs over *Enneapogon polyphyllus* and *\*Cenchrus ciliaris* tussock grasses.



## SPECIES LIST

### Name

*Abutilon oxycarpum*  
*Acacia bivenosa*  
*Acacia paraneura*  
*Acacia pteraneura*  
*Acacia tetragonophylla*  
*\*Cenchrus ciliaris*  
*Chrysopogon fallax*  
*Enneapogon polyphyllus*  
*Eremophila ?forrestii*  
*Gomphrena canescens*  
*Heliotropium tenuifolium*  
*Rhynchosia minima*  
*Senna artemisioides* subsp. *helmsii*  
*Senna glutinosa* subsp. *x luerksenii*  
*Sida fibulifera*  
*Sporobolus australasicus*

### Specimen

WRP019.02

**Western Ridge Pipeline**

**Site WRP-056**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766410 mE; 7403872 mN  
 119.6077 E -23.453416 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia tetragonophylla*, *Acacia synchronicia* and occasional *Acacia aptaneura* mid to tall scattered shrubs over *Senna glutinosa* subsp. x *luerssenii*, *Senna artemisioides* subsp. *helmsii* and *Senna* sp. Meekatharra (E. Bailey 1-36) low scattered shrubs over *Enneapogon* scattered tussock grasses.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia synchronicia*  
*Acacia tetragonophylla*  
*\*Cenchrus setiger*  
*Portulaca cyclophylla*  
*Portulaca oleracea*  
*Ptilotus obovatus* var. *obovatus*  
*Ptilotus roei*  
*Senna artemisioides* subsp. *helmsii*  
*Senna glutinosa* subsp. x *luerssenii*  
*Senna* sp. Meekatharra (E. Bailey 1-26)  
*Sporobolus australasicus*  
*Trianthema triquetrum*

WRP038.02



**Western Ridge Pipeline**
**Site WRP-057**

**Date** 27/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone 50  
766150 mE; 7403930 mN  
119.6052 E -23.452928 S  
**Veg Condition** Degraded  
**Soil** Clay Loam  
**Rock Type** None Discernible  
**Fire Age** Old (6+ yr)  
**Habitat** Drainage Area/ Floodplain  
**Vegetation** Open *Acacia aptaneura* woodland with *Acacia tetragonophylla* over *Eremophila forrestii* subsp. *forrestii* and *Eremophila lachnocalyx* over thick tussock grasses of *Dactyloctenium radulans*, *Enneapogon polyphyllus*, *Enteropogon ramosus* and *\*Cenchrus ciliaris*.

**SPECIES LIST**

Name	Specimen
<i>Acacia aptaneura</i>	
<i>Acacia tetragonophylla</i>	
<i>Aristida contorta</i>	
<i>Arivela viscosa</i>	
<i>*Cenchrus ciliaris</i>	
<i>*Cenchrus setiger</i>	
<i>Dactyloctenium radulans</i>	
<i>Enneapogon polyphyllus</i>	
<i>Enteropogon ramosus</i>	WRP039.02
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	
<i>Eremophila lachnocalyx</i>	
<i>Heliotropium tenuifolium</i>	
<i>*Malvastrum americanum</i>	

**Western Ridge Pipeline**

**Site WRP-058**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone 50  
 766195 mE; 7403631 mN  
 119.6057 E -23.455625 S  
**Veg Condition** Good  
**Soil** Sandy Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia Tetragonophylla*, *Acacia synchronicia* and occasional *Acacia aptaneura* mid to tall scattered shrubs over *Senna artemisioides* subsp. *helmsii*, *Senna glutinosa* subsp. *x luerksenii* and *Senna artemisioides* subsp. *oligophylla* low to mid scattered shrubs over *Enneapogon caeruleus* low scattered tussock grasses with patches of *\*Cenchrus ciliaris*.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia synchronicia*  
*Acacia tetragonophylla*  
*Arivela viscosa*  
*\*Cenchrus ciliaris*  
*Enneapogon caeruleus*  
*Hibiscus sturtii* var. *platyphlamys*  
*Ptilotus obovatus* var. *obovatus*  
*Senna artemisioides* subsp. *helmsii*  
*Senna glutinosa* subsp. *x luerksenii*

CVMVopp.03



**Western Ridge Pipeline**
**Site WRP-059**

**Date** 27/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
766315 mE; 7403422 mN  
119.6069 E -23.457491 S  
**Veg Condition** Degraded  
**Soil** Light Clay  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain  
**Vegetation** Open herbland of *Portulaca cyclophylla* and *Trianthema triquetrum* with emergent shrubs of *Acacia tetragonophylla*, *Senna artemisioides* subsp. *helmsii* and *Eremophila lachnocalyx*.

**SPECIES LIST**

Name	Specimen
<i>Acacia tetragonophylla</i>	
<i>Boerhavia coccinea</i>	
<i>Dactyloctenium radulans</i>	
<i>Enteropogon ramosus</i>	WRP039.02
<i>Eremophila lachnocalyx</i>	
<i>Iseilema membranaceum</i>	
<i>Portulaca cyclophylla</i>	MvW.01
<i>Senna artemisioides</i> subsp. <i>helmsii</i>	
<i>Trianthema triquetrum</i>	

**Western Ridge Pipeline**

**Site WRP-060**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766243 mE; 7403463 mN  
 119.6062 E -23.457134 S

**Veg Condition** Poor

**Soil** Clay Loam

**Rock Type** Quartz

**Fire Age** Old (6+ yr)

**Habitat** Drainage Area/ Floodplain

**Vegetation** *Acacia tetragonophylla*, *Acacia synchronicia* and *\*Vachellia farnesiana* mid to tall scattered shrubs over *\*Cenchrus ciliaris*, *Dactyloctenium radulans* and *Enneapogon polyphyllus* low scattered tussock grasses with *Ptilotus obovatus* var. *obovatus* and *Enchylaena tomentosa* var. *tomentosa* scattered low shrubs.



**SPECIES LIST**

**Name**

**Specimen**

*Boerhavia coccinea*  
*\*Cenchrus ciliaris*  
*Dactyloctenium radulans*  
*Enchylaena tomentosa* var. *tomentosa*  
*Enteropogon ramosus*  
*Eremophila lachnocalyx*  
*\*Malvastrum americanum*  
*Portulaca oleracea*  
*Rhagodia eremaea*  
*Trianthema triquetrum*  
*\*Vachellia farnesiana*

WRP039.02



**Western Ridge Pipeline**

**Site WRP-061**

**Date** 27/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766160 mE; 7403235 mN  
 119.6054 E -23.459202 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** Open *Triodia pungens* hummock grassland with low shrubland of *Acacia sibirica* and *Acacia tetragonophylla* with *Senna glutinosa* subsp. x *luerssenii*.

**SPECIES LIST**

**Name**

*Acacia sibirica*  
*Acacia tetragonophylla*  
*Enneapogon polyphyllus*  
*Indigofera monophylla*  
*Senna artemisioides* subsp. *helmsii*  
*Senna artemisioides* subsp. *oligophylla*  
*Senna glutinosa* subsp. x *luerssenii*  
*Tephrosia* sp. Newman (A.A. Mitchell PRP 29)  
*Triodia pungens*

**Specimen**

WRP62.01

**Western Ridge Pipeline**

**Site WRP-062**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone 50  
 766270 mE; 7403270 mN  
 119.6065 E -23.458867 S  
**Veg Condition** Very Good  
**Soil** Silty Clay Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia aptaneura*, *Acacia tetragonophylla* and *Acacia inaequilatera* mid to tall shrubland over *Ptilotus obovatus* var. *obovatus*, *Senna artemisioides* subsp. *helmsii* and *Senna artemisioides* subsp. *oligophylla* low sparse shrubland over *Triodia wiseana* low sparse hummock grassland.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia aptaneura*  
*Acacia inaequilatera*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*\*Cenchrus ciliaris*  
*Eremophila forrestii* subsp. *forrestii*  
*Ptilotus obovatus* var. *obovatus*  
*Senna artemisioides* subsp. *helmsii*  
*Senna artemisioides* subsp. *oligophylla*  
*Triodia wiseana*



**Western Ridge Pipeline**

**Site WRP-063**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766348 mE; 7403112 mN  
 119.6072 E -23.460284 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia synchronicia* and *Acacia tetragonophylla* with occasional patches of *Acacia aptaneura* mid to tall scattered shrubs over *Senna glutinosa* subsp. x *luerssenii*, *Senna artemisioides* subsp. *helmsii* and *Tribulus suberosus* low scattered shrubs.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia aptaneura*  
*Acacia synchronicia*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Eremophila latrobei*  
*Hakea lorea* subsp. *lorea*  
*Portulaca filifolia*  
*Senna artemisioides* subsp. *helmsii*  
*Senna glutinosa* subsp. x *luerssenii*  
*Sporobolus australasicus*  
*Tribulus suberosus*

**Western Ridge Pipeline**

**Site WRP-064**

**Date** 27/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766190 mE; 7402996 mN  
 119.6057 E -23.461353 S

**Veg Condition** Very Good

**Soil** Clay Loam

**Rock Type** Quartz

**Fire Age** Old (6+ yr)

**Habitat** Stony Plain

**Vegetation** Open *Acacia tetragonophylla* and *Acacia aptaneura* over scattered *Senna artemisioides* subsp. *helmsii* and *Eremophila lachnocalyx* shrubs.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia aptaneura*

*Acacia tetragonophylla*

*Aristida contorta*

\**Cenchrus setiger*

*Eremophila lachnocalyx*

*Heliotropium heteranthum*

\**Malvastrum americanum*

*Portulaca filifolia*

*Portulaca oleracea*

*Rhagodia eremaea*

*Sclerolaena cornishiana*

*Senna artemisioides* subsp. *helmsii*

WRP064.01

WRP064.02



**Western Ridge Pipeline**

**Site WRP-065**

**Date** 27/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766123 mE; 7402530 mN  
 119.6051 E -23.465572 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia aptaneura* over tussock *Enneapogon polyphyllus*, *Enteropogon ramosus*, *Dactyloctenium radulans* and *Gomphrena canescens*.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia aptaneura*  
*Aristida contorta*  
*\*Cenchrus setiger*  
*\*Cynodon convergens*  
*Dactyloctenium radulans*  
*Dichanthium sericeum* subsp. *humilius*  
*Enneapogon polyphyllus*  
*Enteropogon ramosus*  
*Eriachne mucronata*  
*Gomphrena canescens*  
*Heliotropium tenuifolium*  
*Portulaca filifolia*  
*Ptilotus roei*  
*Sporobolus australasicus*

WRP039.02

## Western Ridge Pipeline

Site WRP-066

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
766162 mE; 7402798 mN  
119.6055 E -23.463142 S  
**Veg Condition** Good  
**Soil** Clay Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia aptaneura*, *Acacia tetragonophylla* and *Acacia synchronicia* mid to tall scattered shrubs over *Senna artemisioides* subsp. *oligophylla*, *Eremophila lachnocalyx* low to mid scattered shrubs over *Cynodon convergens*, *Aristida inaequiglumis* and *Dichanthium sericeum* subsp. *humilius* low scattered tussock grasses.

## SPECIES LIST

### Name

### Specimen

*Aristida inaequiglumis*  
*Cynodon convergens*  
*Dichanthium sericeum* subsp. *humilius*  
*Eremophila lachnocalyx*  
*Iseilema membranaceum*  
*Rhynchosia minima*  
*Senna artemisioides* subsp. *oligophylla*  
*Sida fibulifera*  
*Tephrosia* sp. Newman (A.A. Mitchell PRP 29)  
*\*Vachellia farnesiana*

WRP015.01

WRP010.03



## Western Ridge Pipeline

## Site WRP-067

**Date** 27/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone 50  
766198 mE; 7402253 mN  
119.6059 E -23.468060 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** Open *Acacia aptaneura* shrubland with *Acacia tetragonophylla* over low *Senna artemisioides* subsp. *helmsii* shrubland over *Enneapogon polyphyllus* tussock grasses.

## SPECIES LIST

### Name

### Specimen

*Acacia aptaneura*  
*Acacia tetragonophylla*  
*\*Cenchrus setiger*  
*Cynodon convergens*  
*Dichanthium sericeum* subsp. *humilius*  
*Enneapogon polyphyllus*  
*Eriachne flaccida*  
*Heliotropium tenuifolium*  
*Iseilema membranaceum*  
*Neptunia dimorphantha*  
*Portulaca filifolia*  
*Portulaca oleracea*  
*Senna artemisioides* subsp. *helmsii*  
*Senna artemisioides* subsp. *oligophylla*  
*Senna hamersleyensis*  
*Tephrosia* sp. Newman (A.A. Mitchell PRP 29)

WRP019.04

WRP068.01

## Western Ridge Pipeline

Site WRP-068

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
766344 mE; 7402628 mN  
119.6073 E -23.464649 S  
**Veg Condition** Very Good  
**Soil** Silty Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia aptaneura*, *Eremophila fraseri* subsp. *fraseri* and *Acacia rhodophloia* mid to tall sparse shrubland over *Senna artemisioides* subsp. *helmsii* low scattered shrubs over *Eriachne mucronata* and *Aristida contorta* low scattered tussock grasses.

## SPECIES LIST

### Name

### Specimen

*Acacia aptaneura*  
*Aristida contorta*  
*Eremophila fraseri* subsp. *fraseri*  
*Eriachne mucronata*  
*Eriachne pulchella* subsp. *pulchella*  
*Heliotropium tenuifolium*  
*Ptilotus helipteroides*  
*Senna artemisioides* subsp. *helmsii*  
*Senna hamersleyensis*

WRP068.01



**Western Ridge Pipeline**

**Site WRP-069**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766358 mE; 7401942 mN  
 119.6075 E -23.470833 S  
**Veg Condition** Degraded  
**Soil** Clay Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Medium Drainage Line  
**Vegetation** \**Cenchrus ciliaris*, \**Cenchrus setiger* and *Chrysopogon fallax* mid tussock grassland with *Acacia citrinoviridis* and *Acacia ?adsurgens* tall sparse shrubland with *Eucalyptus victrix* low to mid scattered trees.



**SPECIES LIST**

**Name**

*Acacia ?adsurgens*  
*Acacia citrinoviridis*  
*Alternanthera denticulata*  
 \**Bidens bipinnata*  
 \**Cenchrus ciliaris*  
 \**Cenchrus setiger*  
*Centipeda minima* subsp. *macrocephala*  
*Corchorus tridens*  
*Cyperus vaginatus*  
*Eragrostis tenellula*  
*Eucalyptus victrix*  
 \**Malvastrum americanum*  
*Marsilea hirsuta*  
*Portulaca oleracea*

**Specimen**

WRP023.01

**Western Ridge Pipeline**

**Site WRP-070**

**Date** 27/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766215 mE; 7401703 mN  
 119.6062 E -23.473020 S

**Veg Condition** Excellent

**Soil** Silty Loam

**Rock Type** BIF

**Fire Age** Old (6+ yr)

**Habitat** Stony Plain

**Vegetation** *Triodia vanleeuwenii* low hummock grassland with *Senna glutinosa* subsp. x *luerssenii*, *Acacia ?adsurgens* and *Acacia aptaneura* mid to tall sparse shrubland with *Acacia pruinocarpa* low scattered trees.



**SPECIES LIST**

**Name**

*Acacia ?adsurgens*  
*Acacia aptaneura*  
*Acacia pruinocarpa*  
*Acacia tetragonophylla*  
*Senna artemisioides* subsp. *helmsii*  
*Senna glutinosa* subsp. *pruinosa*  
*Senna glutinosa* subsp. x *luerssenii*  
*Triodia vanleeuwenii*

**Specimen**

WRP046.01



**Western Ridge Pipeline**

**Site WRP-071**

**Date** 28/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766288 mE; 7401493 mN  
 119.6069 E -23.474903 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** Tall open *Acacia aptaneura* and *Acacia tetragonophylla* shrubland over *Senna glutinosa* subsp. x *luerssenii*, *Senna artemisioides* subsp. *helmsii* and *Eremophila forrestii* subsp. *forrestii* over *Enneapogon polyphyllus* and *Aristida contorta* tussock grasses.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia aptaneura*  
*Acacia synchronicia*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*\*Cenchrus ciliaris*  
*Duperreya commixta*  
*Enneapogon polyphyllus*  
*Eremophila forrestii* subsp. *forrestii*  
*Eriachne mucronata*  
*Gomphrena canescens*  
*Heliotropium tenuifolium*  
*Portulaca oleracea*  
*Ptilotus astrolasius*  
*Ptilotus obovatus* var. *obovatus*  
*Senna artemisioides* subsp. *helmsii*  
*Senna* sp. Meekatharra (E. Bailey 1-26)  
*Tribulus suberosus*

**Western Ridge Pipeline**
**Site WRP-072**

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
766143 mE; 7401244 mN  
119.6056 E -23.477166 S  
**Veg Condition** Very Good  
**Soil** Silty Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia aptaneura* and *Acacia pruinocarpa* low open woodland over *Triodia pungens* low sparse hummock grassland with *Senna glutinosa* subsp. x *luerssenii*, *Tribulus suberosus* and *Acacia tetragonophylla* mid sparse shrubland.

**SPECIES LIST**
**Name**
**Specimen**

*Acacia aptaneura*  
*Acacia pruinocarpa*  
*Acacia rhodophloia*  
*Acacia tetragonophylla*  
*Duperreya commixta*  
*Enneapogon polyphyllus*  
*Eremophila ?platycalyx*  
*Eriachne pulchella* subsp. *pulchella*  
*Paraneurachne muelleri*  
*Ptilotus exaltatus*  
*Senna glutinosa* subsp. x *luerssenii*  
*Tribulus suberosus*  
*Triodia pungens*

WRP019.04  
WRP047.01



## Western Ridge Pipeline

Site WRP-073

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
766246 mE; 7401028 mN  
119.6066 E -23.479104 S  
**Veg Condition** Very Good  
**Soil** Silty Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia aptaneura* and *Acacia incurvaneura* low open woodland over *Senna glutinosa* subsp. x *luerssenii*, *Acacia tetragonophylla* and *Eremophila forrestii* subsp. *forrestii* mid to tall scattered shrubs over isolated patches of hummock and tussock grasses.

## SPECIES LIST

### Name

*Acacia aptaneura*  
*Acacia incurvaneura*  
*Acacia pruinocarpa*  
*Acacia rhodophloia*  
*Enneapogon polyphyllus*  
*Eremophila forrestii* subsp. *forrestii*  
*Ptilotus obovatus* var. *obovatus*  
*Senna glutinosa* subsp. x *luerssenii*  
*Sida ectogama*  
*Tribulus suberosus*  
*Triodia pungens*  
*Triodia wiseana*

### Specimen

WRP073.01  
  
WRP019.04

**Western Ridge Pipeline**

**Site WRP-074**

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766066 mE; 7400638 mN  
 119.6049 E -23.482655 S  
**Veg Condition** Good  
**Soil** Silty Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Hardpan Plain



**Vegetation** *Acacia incurvaneura* and *Acacia aptaneura* with occasional *Acacia pruinocarpa* and *Grevillea berryana* low woodland over *Enneapogon polyphyllus*, *Aristida contorta* and *Digitaria brownii* low scattered tussock grasses.

**SPECIES LIST**

<b>Name</b>	<b>Specimen</b>
<i>Abutilon otocarpum</i>	
<i>Acacia incurvaneura</i>	WRP073.01
<i>Acacia pruinocarpa</i>	
<i>Acacia subcontorta</i>	WRP074.01
<i>Afrohybanthus aurantiacus</i>	
<i>Aristida contorta</i>	
<i>Aristida inaequiglumis</i>	WRP005.01
* <i>Bidens bipinnata</i>	
<i>Cheilanthes sieberi</i>	
<i>Enneapogon polyphyllus</i>	WRP019.04
<i>Grevillea berryana</i>	WRP074.03
<i>Ipomoea calobra</i>	WRP074.02
<i>Solanum lasiophyllum</i>	



## Western Ridge Pipeline

Site WRP-075

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
766327 mE; 7400666 mN  
119.6075 E -23.482356 S  
**Veg Condition** Very Good  
**Soil** Silty Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia incurvaneura*, *Acacia pruinocarpa* and *Grevillea berryana* low open woodland over *Eremophila forrestii* subsp. *forrestii*, *Senna artemisioides* subsp. *oligophylla* x ? (hybrid) mid sparse shrubland over *Enneapogon polyphyllus* and *Triodia pungens* scattered tussock and hummock grassland.

## SPECIES LIST

Name	Specimen
<i>Acacia incurvaneura</i>	WRP073.01
<i>Acacia paraneura</i>	
<i>Acacia subcontorta</i>	WRP074.01
<i>Aristida contorta</i>	
<i>Aristida inaequiglumis</i>	WRP005.01
<i>Enneapogon polyphyllus</i>	WRP019.04
<i>Eragrostis xerophila</i>	WRP005.02
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	
<i>Grevillea berryana</i>	WRP074.03
<i>Hakea lorea</i> subsp. <i>lorea</i>	
<i>Hibiscus sturtii</i> var. <i>campylochlamys</i>	
<i>Senna artemisioides</i> subsp. <i>helmsii</i>	
<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x ? (hybrid)	CVMVopp.05
<i>Senna glaucifolia</i>	WRP075.01
<i>Sida ectogama</i>	
<i>Sida fibulifera</i>	
<i>Triodia pungens</i>	

**Western Ridge Pipeline**

**Site WRP-076**

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766305 mE; 7400258 mN  
 119.6073 E -23.486038 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain  
**Vegetation** *Acacia incurvaneura* tall scattered shrubs over *Senna artemisioides* subsp. *helmsii* scattered mid shrubs over isolated patches of *Aristida contorta* tussock grasses.



**SPECIES LIST**

**Name**

*Acacia incurvaneura*  
*Aristida contorta*  
*\*Bidens bipinnata*  
*Cheilanthes sieberi*  
*Eriachne pulchella* subsp. *pulchella*  
*Perotis rara*  
*Ptilotus obovatus* var. *obovatus*  
*Ptilotus schwartzii* var. *schwartzii*  
*Senna artemisioides* subsp. *helmsii*  
*Senna glaucifolia*  
*Sida ectogama*

**Specimen**

WRP073.01

WRP075.01



## Western Ridge Pipeline

Site WRP-077

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
766268 mE; 7399575 mN  
119.6071 E -23.492213 S

**Veg Condition** Good

**Soil** Clay Loam

**Rock Type** BIF

**Fire Age** Old (6+ yr)

**Habitat** Stony Plain

**Vegetation** *Acacia incurvaneura*, *Acacia subcontorta* and *Acacia aptaneura* low woodland over *Digitaria brownii*, *Aristida inaequiglumis* and *Enneapogon polyphyllus* low open tussock grassland.



## SPECIES LIST

### Name

*Abutilon macrum*  
*Acacia incurvaneura*  
*Acacia pruinocarpa*  
*Acacia subcontorta*  
*Afrohybanthus aurantiacus*  
*Aristida inaequiglumis*  
*\*Bidens bipinnata*  
*Cheilanthes sieberi*  
*Digitaria brownii*  
*Grevillea berryana*  
*Ipomoea calobra*  
*Panicum decompositum*  
*Paspalidium clementii*  
*Psyrax suaveolens*  
*Senna artemisioides* subsp. *oligophylla* x ? (hybrid)  
*Senna notabilis*  
*Sida ectogama*  
*Sida fibulifera*

### Specimen

WRP103.02  
WRP073.01  
  
WRP074.01  
  
WRP005.01  
  
WRP077.01  
WRP074.03  
WRP074.02  
  
WRP077.02  
  
CVMVopp.05

## Western Ridge Pipeline

Site WRP-078

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
766144 mE; 7399837 mN  
119.6058 E -23.489864 S

**Veg Condition** Very Good

**Soil** Clay Loam

**Rock Type** BIF

**Fire Age** Old (6+ yr)

**Habitat** Stony Plain

**Vegetation** *Acacia subcontorta*, *Acacia incurvaneura* and *Acacia aptaneura* tall scattered shrubs over *Senna glaucifolia* and *Ptilotus schwartzii* var. *schwartzii* low scattered shrubs over isolated patches of *Aristida contorta*.



## SPECIES LIST

### Name

*Acacia aptaneura*  
*Acacia incurvaneura*  
*Acacia pruinocarpa*  
*Acacia subcontorta*  
*Aristida contorta*  
*\*Bidens bipinnata*  
*Cheilanthes sieberi*  
*Eriachne pulchella* subsp. *pulchella*  
*Grevillea berryana*  
*Monachather paradoxus*  
*Psyrax suaveolens*  
*Ptilotus schwartzii* var. *schwartzii*  
*Senna glaucifolia*  
*Triodia vanleeuwenii*

### Specimen

WRP073.01  
WRP074.01  
WRP074.03  
WRP075.01



## Western Ridge Pipeline

Site WRP-079

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
766100 mE; 7400184 mN  
119.6053 E -23.486746 S  
**Veg Condition** Good  
**Soil** Clay Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia subcontorta*, *Acacia incurvaneura* and *Grevillea berryana* low woodland over *Enneapogon polyphyllus*, *Digitaria brownii*, *Aristida inaequiglumis* and *Aristida contorta* low sparse tussock grassland over *Afrohybanthus aurantiacus* low sparse herbland.

## SPECIES LIST

Name	Specimen
<i>Abutilon otocarpum</i>	
<i>Acacia incurvaneura</i>	WRP073.01
<i>Acacia subcontorta</i>	WRP074.01
<i>Afrohybanthus aurantiacus</i>	
<i>Aristida contorta</i>	
<i>Aristida inaequiglumis</i>	WRP005.01
* <i>Bidens bipinnata</i>	
<i>Cheilanthes sieberi</i>	
<i>Digitaria brownii</i>	WRP077.01
<i>Enneapogon polyphyllus</i>	WRP019.04
<i>Gomphrena canescens</i>	
<i>Grevillea berryana</i>	WRP074.03
<i>Hibiscus sturtii</i> var. <i>campyloclamys</i>	
<i>Ipomoea calobra</i>	WRP074.02
<i>Psyrax suaveolens</i>	
<i>Thyridolepis mitchelliana</i>	MvWopp003

## Western Ridge Pipeline

Site WRP-080

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
765446 mE; 7398015 mN  
119.5993 E -23.506423 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Granite  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia aptaneura* and *Grevillea berryana* low open woodland over *Triodia wiseana* low sparse hummock grassland with *Senna artemisioides* subsp. *oligophylla* x hybrid, *Eremophila forrestii* subsp. *forrestii* and *Senna artemisioides* subsp. *helmsii* low scattered shrubs.

## SPECIES LIST

### Name

*Acacia ?adsurgens*  
*Acacia aptaneura*  
*Aristida contorta*  
*Cheilanthes sieberi*  
*Enneapogon polyphyllus*  
*Eragrostis eriopoda*  
*Grevillea berryana*  
*Ptilotus obovatus* var. *obovatus*  
*Ptilotus schwartzii* var. *schwartzii*  
*Senna artemisioides* subsp. *helmsii*  
*Senna artemisioides* subsp. *oligophylla* x ? (hybrid)  
*Senna glaucifolia*  
*Sida ectogama*  
*Sida fibulifera*  
*Tephrosia* sp. Newman (A.A. Mitchell PRP 29)  
*Tribulus hirsutus*  
*Triodia wiseana*

### Specimen

WRP023.01  
  
  
WRP019.04  
WRP080.01  
WRP074.03  
  
CVMVopp.05  
WRP075.01  
  
WRP010.03



**Western Ridge Pipeline**

**Site WRP-081**

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 765923 mE; 7398340 mN  
 119.6039 E -23.503411 S

**Veg Condition** Good

**Soil** Clay Loam

**Rock Type** BIF

**Fire Age** Old (6+ yr)

**Habitat** Stony Plain

**Vegetation** *Acacia subcontorta*, *Acacia incurvaneura* and *Acacia pruinocarpa* low woodland over *Aristida inaequiglumis*, *Monachather paradoxus* and *Aristida contorta* tussock grasses.



**SPECIES LIST**

**Name**

*Acacia incurvaneura*  
*Acacia pruinocarpa*  
*Acacia subcontorta*  
*Aristida inaequiglumis*  
*\*Bidens bipinnata*  
*Cheilanthes sieberi*  
*Eremophila latrobei*  
*Evolvulus alsinoides* var. *decumbens*  
*Grevillea berryana*  
*Ipomoea calobra*  
*Monachather paradoxus*  
*Senna glaucifolia*  
*Thyridolepis mitchelliana*

**Specimen**

WRP073.01  
 WRP074.01  
 WRP005.01  
 WRP074.03  
 WRP074.02  
 WRP081.01  
 MvWopp003

**Western Ridge Pipeline**

**Site WRP-082**

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766160 mE; 7398694 mN  
 119.6062 E -23.500173 S

**Veg Condition** Poor  
**Soil** Silty Clay Loam  
**Rock Type** Granite  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain

**Vegetation** *Acacia aptaneura*, *Acacia subcontorta* and *Corymbia candida* subsp. *dipsodes* low woodland over *Enneapogon polyphyllus* and *Aristida inaequiglumis* open tussock grassland.



**SPECIES LIST**

**Name**

*Abutilon lepidum*  
*Abutilon otocarpum*  
*Acacia aptaneura*  
*Acacia subcontorta*  
*Aristida inaequiglumis*  
*Arivela viscosa*  
 \**Bidens bipinnata*  
 \**Cenchrus ciliaris*  
*Corymbia candida* subsp. *dipsodes*  
*Enneapogon polyphyllus*  
 \**Malvastrum americanum*  
*Pterocaulon sphacelatum*  
*Ptilotus obovatus* var. *obovatus*

**Specimen**

WRP004.03  
  
 WRP074.01  
 WRP005.01  
  
 WRP019.04



**Western Ridge Pipeline**

**Site WRP-083**

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 766112 mE; 7399025 mN  
 119.6057 E -23.497202 S

**Veg Condition** Good

**Soil** Clay Loam

**Rock Type** Granite

**Fire Age** Old (6+ yr)

**Habitat** Stony Plain

**Vegetation** *Acacia ?adsurgens*, *Acacia paraneura* and *Acacia subcontorta* tall scattered shrubs over *Ptilotus schwartzii* var. *schwartzii* low scattered shrubs over scattered tussock grasses.



**SPECIES LIST**

**Name**

*Acacia ?adsurgens*  
*Acacia paraneura*  
*Acacia subcontorta*  
*Aristida contorta*  
*Cheilanthes sieberi*  
*Eriachne pulchella* subsp. *pulchella*  
*Grevillea berryana*  
*Indigofera georgei*  
*Maireana villosa*  
*Panicum decompositum*  
*Portulaca filifolia*  
*Ptilotus obovatus* var. *obovatus*  
*Ptilotus roei*  
*Ptilotus schwartzii* var. *schwartzii*

**Specimen**

WRP023.01  
 WRP074.01  
 WRP074.03  
 WRPopp.01

## Western Ridge Pipeline

Site WRP-084

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
765842 mE; 7398612 mN  
119.6031 E -23.500971 S  
**Veg Condition** Poor  
**Soil** Clay Loam  
**Rock Type** Granite  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain



**Vegetation** *Acacia aptaneura*, *Acacia subcontorta* and *Acacia incurvaneura* with occasional *Corymbia candida* subsp. *dipsodes* low woodland over *Enneapogon polyphyllus*, *Aristida contorta* and *Aristida inaequiglumis* low sparse tussock grassland with \**Bidens bipinnata*, *Indigofera georgei* and *Ptilotus obovatus* var. *obovatus* low scattered shrubs and herbs.

## SPECIES LIST

### Name

### Specimen

<i>Abutilon otocarpum</i>	
<i>Acacia aptaneura</i>	
<i>Acacia incurvaneura</i>	WRP073.01
<i>Acacia subcontorta</i>	WRP074.01
<i>Aristida contorta</i>	
<i>Aristida inaequiglumis</i>	WRP005.01
<i>Arivela viscosa</i>	
* <i>Bidens bipinnata</i>	
<i>Chrysopogon fallax</i>	
<i>Corymbia candida</i> subsp. <i>dipsodes</i>	
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	
<i>Grevillea berryana</i>	WRP074.03
<i>Indigofera georgei</i>	
<i>Ptilotus obovatus</i> var. <i>obovatus</i>	
<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794) (P3)	CVMVopp.06



## Western Ridge Pipeline

Site WRP-085

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
765478 mE; 7398298 mN  
119.5996 E -23.503860 S

**Veg Condition** Poor

**Soil** Clay Loam

**Rock Type** Dolerite

**Fire Age** Old (6+ yr)

**Habitat** Sandy/ Stony Plain

**Vegetation** *Acacia incurvaneura*, *Acacia subcontorta* and *Grevillea berryana* low woodland with *Corymbia candida* subsp. *dipsodes* low trees over *Aristida inaequiglumis*, *Aristida contorta* and *Enneapogon polyphyllus* low scattered tussock grasses.



## SPECIES LIST

### Name

*Acacia incurvaneura*  
*Acacia subcontorta*  
*Aristida contorta*  
*Aristida inaequiglumis*  
*\*Bidens bipinnata*  
*Corymbia candida* subsp. *dipsodes*  
*Enneapogon polyphyllus*  
*Grevillea berryana*  
*Indigofera georgei*  
*Ipomoea calobra*  
*Psychodra suaveolens*  
*Vincetoxicum lineare*

### Specimen

WRP073.01  
WRP074.01  
  
WRP005.01  
  
WRP019.04  
WRP074.03  
  
WRP074.02

## Western Ridge Pipeline

Site WRP-086

**Date** 28/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
764923 mE; 7397743 mN  
119.5943 E -23.508960 S

**Veg Condition** Good

**Soil** Clay Loam

**Rock Type** BIF

**Fire Age** Old (6+ yr)

**Habitat** Sandy/ Stony Plain

**Vegetation** Tall *Acacia subcontorta* with *Acacia incurvaneura* and *Grevillea berryana* shrubs over *Enneapogon polyphyllus* and *Digitaria ctenantha* tussock grasses.



## SPECIES LIST

### Name

*Acacia incurvaneura*  
*Acacia subcontorta*  
*Aristida inaequiglumis*  
*\*Bidens bipinnata*  
*Digitaria ctenantha*  
*Enneapogon polyphyllus*  
*Eremophila latrobei*  
*Gomphrena canescens*  
*Grevillea berryana*  
*Senna glaucifolia*  
*Sida ectogama*  
*Tribulus suberosus*

### Specimen

WRP073.01  
WRP074.01  
WRP005.01  
  
WRP019.03  
WRP019.04  
  
WRP074.03



**Western Ridge Pipeline**

**Site WRP-087**

**Date** 28/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
 764430 mE; 7397098 mN  
 119.5895 E -23.514857 S  
**Veg Condition** Degraded  
**Soil** Clay Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain  
**Vegetation** *Cynodon convergens* tussock grassland.



**SPECIES LIST**

**Name**

**Specimen**

*Arivela viscosa*  
*Astrebla elymoides*  
*Boerhavia coccinea*  
*Cynodon convergens*  
*Dichanthium sericeum* subsp. *humilius*  
*Enchylaena tomentosa* var. *tomentosa*  
*Enneapogon polyphyllus*  
*Eragrostis xerophila*  
*Heliotropium tenuifolium*  
*Iseilema membranaceum*  
*Portulaca filifolia*  
*Ptilotus roei*  
*Rhagodia eremaea*  
*Salsola australis*  
*Senna hamersleyensis*  
*Sida fibulifera*  
*Trianthema triquetrum*

WRP87.01

WRP068.01

**Western Ridge Pipeline**

**Site WRP-088**

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone 50  
 764034 mE; 7396622 mN  
 119.5858 E -23.519218 S  
**Veg Condition** Good  
**Soil** Silty Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia aptaneura* and *Acacia synchronicia* tall sparse shrubland over *Acacia tetragonophylla*, *Senna glutinosa* subsp. x *luerssenii* and *Eremophila ?margarethae* mid to low scattered shrubs over patches of *Aristida contorta* low tussock grasses.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia aptaneura*  
*Acacia synchronicia*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Dactyloctenium radulans*  
*Eremophila ?margarethae*  
*Eremophila forrestii* subsp. *forrestii*  
*Maireana triptera*  
*Portulaca filifolia*  
*Ptilotus obovatus* var. *obovatus*  
*Rhagodia eremaea*  
*Santalum acuminatum*  
*Senna artemisioides* subsp. *helmsii*  
*Senna glutinosa* subsp. x *luerssenii*  
*Trianthema triquetrum*

WRP088.01



**Western Ridge Pipeline**

**Site WRP-089**

**Date** 28/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone 50  
 764489 mE; 7396978 mN  
 119.5901 E -23.515934 S

**Veg Condition** Very Good

**Soil** Medium Clay

**Rock Type** Quartz

**Fire Age** Old (6+ yr)

**Habitat** Sandy/ Stony Plain

**Vegetation** Open *Acacia incurvaneura* over scattered *Eremophila forrestii* subsp. *forrestii* over open *Triodia wiseana* and *Aristida contorta* hummock and tussock grasses.



**SPECIES LIST**

**Name**

*Acacia incurvaneura*  
*Acacia pruinocarpa*  
*Acacia rhodophloia*  
*Aristida contorta*  
*Boerhavia coccinea*  
*Enneapogon polyphyllus*  
*Eremophila forrestii* subsp. *forrestii*  
*Eriachne pulchella*  
*Gomphrena canescens*  
*Portulaca oleracea*  
*Ptilotus astrolasius*  
*Ptilotus obovatus* var. *obovatus*  
*Rhagodia eremaea*  
*Triodia wiseana*

**Specimen**

WRP089.01

**Western Ridge Pipeline**

**Site WRP-090**

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 763895 mE; 7396873 mN  
 119.5843 E -23.516975 S

**Veg Condition** Poor

**Soil** Sand

**Rock Type** Dolerite

**Fire Age** Old (6+ yr)

**Habitat** Major Drainage Line

**Vegetation** *Eucalyptus victrix*, *Acacia citrinoviridis* and *Acacia coriacea* subsp. *pendens* mid to low open woodland over *\*Cenchrus ciliaris*, *\*Cenchrus setiger* and *Eulalia aurea* mid open tussock grassland.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia citrinoviridis*  
*Acacia coriacea* subsp. *pendens*  
*Alternanthera nana*  
*\*Cenchrus ciliaris*  
*\*Cenchrus setiger*  
*Centipeda minima* subsp. *macrocephala*  
*Cyperus vaginatus*  
*Eragrostis tenellula*  
*Eucalyptus victrix*  
*Eulalia aurea*  
*Leptochloa digitata*  
*\*Malvastrum americanum*  
*Marsilea hirsuta*  
*Phyllanthus maderaspatensis*  
*Tephrosia rosea* var. *Fortescue* creeks (M.I.H. Brooker 2186)  
*Themeda triandra*

CVopp.02



**Western Ridge Pipeline**

**Site WRP-091**

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 763917 mE; 7397008 mN  
 119.5845 E -23.515761 S

**Veg Condition** Poor

**Soil** Clay Loam

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Drainage Area/ Floodplain

**Vegetation** *Triodia longiceps* mid sparse hummock grassland over *\*Cenchrus ciliaris*, *Eriachne aristidea* and *Dactyloctenium radulans* low sparse tussock grassland with *Eucalyptus xerothematica* low scattered trees.



**SPECIES LIST**

**Name**

*Acacia citrinoviridis*  
*Acacia tetragonophylla*  
*Boerhavia coccinea*  
*\*Cenchrus ciliaris*  
*Dactyloctenium radulans*  
*Eriachne aristidea*  
*Eucalyptus xerothematica*  
*Hakea lorea* subsp. *lorea*  
*Triodia longiceps*

**Specimen**

**Western Ridge Pipeline**

**Site WRP-092**

**Date** 28/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 764023 mE; 7397091 mN  
 119.5856 E -23.514992 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Limestone  
**Fire Age** Old (6+ yr)  
**Habitat** Calcrete Plain  
**Vegetation** *Triodia angusta* low hummock grassland with *Eucalyptus socialis* subsp. *eucentrica* low scattered trees.



**SPECIES LIST**

**Name**

*Acacia synchronicia*  
*Eucalyptus socialis* subsp. *eucentrica*  
*Ptilotus polystachyus*  
*Triodia angusta*

**Specimen**

WRP045.01



## Western Ridge Pipeline

Site WRP-093

**Date** 29/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
779525 mE; 7409451 mN  
119.7349 E -23.400874 S  
**Veg Condition** Very Good  
**Soil** Silty Clay Loam  
**Rock Type** None Discernible  
**Fire Age** Moderate (3 to 5 yr)  
**Habitat** Drainage Area/ Floodplain



**Vegetation** *Triodia pungens* low open hummock grassland with *Acacia dictyophleba*, *Acacia pachyacra* and *Eremophila longifolia* mid to tall open shrubland over *Chrysopogon fallax*, *Enneapogon polyphyllus* and *Aristida inaequiglumis* low scattered tussock grasses.

## SPECIES LIST

### Name

### Specimen

*Abutilon otocarpum*  
*Acacia ancistrocarpa*  
*Acacia aptaneura*  
*Acacia bivenosa*  
*Acacia dictyophleba*  
*Acacia maitlandii*  
*Acacia pachyacra*  
*Acacia pruinocarpa*  
*Acacia tetragonophylla*  
*Aristida inaequiglumis*  
*Arivela viscosa*  
*Boerhavia coccinea*  
*\*Cenchrus ciliaris*  
*Chrysopogon fallax*  
*Corchorus lasiocarpus* subsp. *parvus*  
*Corymbia hamersleyana*  
*Crotalaria medicaginea* var. *neglecta*  
*Cymbopogon ambiguus*  
*Enneapogon polyphyllus*  
*Eremophila longifolia*  
*Eucalyptus xerothermica*  
*Eulalia aurea*  
*Glinus lotoides*  
*Paraneurachne muelleri*  
*Ptilotus astrolasius*  
*Ptilotus exaltatus*  
*Ptilotus helipteroides*  
*Ptilotus polystachyus*  
*Santalum lanceolatum*  
*Senna artemisioides* subsp. *helmsii*  
*Senna artemisioides* subsp. *oligophylla*  
*Sida fibulifera*  
*Triodia pungens*

WRP005.01

WRP019.04

WRP093.01

## Western Ridge Pipeline

Site WRP-094

**Date** 29/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
779846 mE; 7409323 mN  
119.7381 E -23.401973 S  
**Veg Condition** Good  
**Soil** Silty Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia aptaneura* tall sparse shrubland over *Eremophila fraseri* subsp. *fraseri*, *Senna glutinosa* subsp. x *luerssenii* and juvenile *Acacia aptaneura* mid scattered shrubs over *Triodia pungens* low scattered hummock grasses and *Enneapogon polyphyllus* low scattered tussock grasses.

## SPECIES LIST

### Name

*Abutilon cunninghamii*  
*Acacia aptaneura*  
*Acacia pruinocarpa*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*\*Bidens bipinnata*  
*Boerhavia coccinea*  
*\*Cenchrus ciliaris*  
*Duperreya commixta*  
*Enneapogon polyphyllus*  
*Eremophila fraseri* subsp. *fraseri*  
*Eremophila latrobei*  
*Heliotropium tenuifolium*  
*Indigofera monophylla*  
*Ptilotus clementii*  
*Ptilotus roei*  
*Senna artemisioides* subsp. *helmsii*  
*Senna glutinosa* subsp. x *luerssenii*  
*Senna notabilis*  
*\*Setaria verticillata*  
*Sporobolus australasicus*  
*Triodia pungens*

### Specimen

WRP006.01

WRP019.04



## Western Ridge Pipeline

Site WRP-095

**Date** 29/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
780246 mE; 7409486 mN  
119.7420 E -23.400441 S

**Veg Condition** Good

**Soil** Silty Clay Loam

**Rock Type** Dolerite

**Fire Age** Old (6+ yr)

**Habitat** Stony Plain

**Vegetation** *Senna artemisioides* subsp. *helmsii*, *Senna artemisioides* subsp. *oligophylla* and *Acacia synchronicia* mid to low scattered shrubs over *Aristida contorta*, *Enneapogon polyphyllus* and *Dactyloctenium radulans* low scattered tussock grasses.



## SPECIES LIST

### Name

### Specimen

*Acacia synchronicia*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Boerhavia coccinea*  
*Calandrinia schistorhiza*  
*\*Cenchrus ciliaris*  
*Dactyloctenium radulans*  
*Enneapogon polyphyllus*  
*Eremophila fraseri* subsp. *fraseri*  
*Goodenia muelleriana*  
*Iseilema membranaceum*  
*Portulaca filifolia*  
*Portulaca oleracea*  
*Ptilotus roei*  
*Rhagodia eremaea*  
*Rhynchosia minima*  
*Senna artemisioides* subsp. *helmsii*  
*Senna artemisioides* subsp. *oligophylla*  
*Tragus australianus*  
*Trianthema triquetrum*

WRP095.01

WRP019.04

WRP095.02

**Western Ridge Pipeline**

**Site WRP-096**

**Date** 29/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone 50  
 780465 mE; 7409557 mN  
 119.7441 E -23.399757 S

**Veg Condition** Good

**Soil** Silty Clay Loam

**Rock Type** Dolerite

**Fire Age** Old (6+ yr)

**Habitat** Stony Plain

**Vegetation** *Acacia aptaneura* low open woodland over *Senna glutinosa* subsp. x *luerssenii*, *Acacia aptaneura* and *Eremophila latrobei* mid to tall scattered shrubs over *Enneapogon polyphyllus*, \**Cenchrus ciliaris* and *Eriachne mucronata* low scattered tussock grasses.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia aptaneura*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Aristida inaequiglumis*  
 \**Cenchrus ciliaris*  
*Enchylaena tomentosa* var. *tomentosa*  
*Enneapogon polyphyllus*  
*Eremophila latrobei*  
*Eriachne mucronata*  
*Eriachne pulchella* subsp. *pulchella*  
*Eulalia aurea*  
*Perotis rara*  
*Polycarpaea corymbosa*  
*Portulaca filifolia*  
*Ptilotus obovatus* var. *obovatus*  
*Senna glutinosa* subsp. x *luerssenii*  
*Tragus australianus*  
*Tribulus suberosus*  
*Trichodesma zeylanicum* var. *zeylanicum*

WRP005.01

WRP096.01

WRP095.02



**Western Ridge Pipeline**

**Site WRP-097**

**Date** 29/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone 50  
 778335 mE; 7409591 mN  
 119.7233 E -23.399822 S  
**Veg Condition** Degraded  
**Soil** Light Clay  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Minor Drainage Line  
**Vegetation** Open *Corymbia candida* subsp. *dipsodes*, *Acacia aptaneura* and *Acacia citrinoviridis* woodland over closed *\*Cenchrus ciliaris* and *Triodia angusta* hummock grassland.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia aptaneura*  
*Acacia bivenosa*  
*Acacia citrinoviridis*  
*Acacia synchronicia*  
*Acacia tetragonophylla*  
*\*Cenchrus ciliaris*  
*\*Cenchrus setiger*  
*Corymbia candida* subsp. *dipsodes*  
*Enchylaena tomentosa* var. *tomentosa*  
*Hakea lorea* subsp. *lorea*  
*Ptilotus exaltatus*  
*Rhynchosia minima*  
*Sclerolaena diacantha*  
*Sclerolaena eriacantha*  
*Triodia angusta*  
*\*Vachellia farnesiana*

WRP097.01  
 WRP038.01

## Western Ridge Pipeline

Site WRP-098

**Date** 29/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
778233 mE; 7409764 mN  
119.7223 E -23.398278 S

**Veg Condition** Excellent

**Soil** Silty Loam

**Rock Type** Dolerite

**Fire Age** Old (6+ yr)

**Habitat** Basalt Outcrops

**Vegetation** *Triodia wiseana* low hummock grassland with *Acacia bivenosa*, *Acacia inaequilatera* and *Hakea lorea* subsp. *lorea* mid to tall sparse shrubland.



## SPECIES LIST

### Name

### Specimen

*Acacia bivenosa*  
*Acacia inaequilatera*  
*Acacia tetragonophylla*  
*Corchorus incanus* subsp. *lithophilus*  
*Corchorus lasiocarpus* subsp. *parvus*  
*Duperreya commixta*  
*Eremophila fraseri* subsp. *fraseri*  
*Goodenia muelleriana*  
*Hakea lorea* subsp. *lorea*  
*Ptilotus astrolasius*  
*Ptilotus polystachyus*  
*Scaevola amblyanthera* var. *amblyanthera*  
*Senna artemisioides* subsp. *oligophylla*  
*Triodia wiseana*

WRP046.02



**Western Ridge Pipeline**

**Site WRP-099**

**Date** 29/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 777710 mE; 7409595 mN  
 119.7172 E -23.399884 S

**Veg Condition** Poor  
**Soil** Clayey Sand  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Minor Drainage Line

**Vegetation** \**Cenchrus ciliaris*, \**Cenchrus setiger* and *Themeda triandra* mid open tussock grassland with *Acacia citrinoviridis*, *Santalum lanceolatum* and *Petalostylis labicheoides* tall open shrubland with *Eucalyptus xerothermica* and *Acacia citrinoviridis* low scattered trees.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia citrinoviridis*  
*Arivela viscosa*  
 \**Cenchrus ciliaris*  
 \**Cenchrus setiger*  
*Duperreya commixta*  
*Eucalyptus xerothermica*  
*Eulalia aurea*  
*Evolvulus alsinoides* var. *decumbens*  
*Paraneurachne muelleri*  
*Petalostylis labicheoides*  
*Santalum lanceolatum*  
*Sporobolus australasicus*  
*Themeda triandra*  
*Triodia angusta*

WRP099.01

## Western Ridge Pipeline

## Site WRP-101

**Date** 29/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone 50  
774626 mE; 7408079 mN  
119.6873 E -23.414090 S  
**Veg Condition** Excellent  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain



**Vegetation** *Acacia aptaneura*, *Acacia tetragonophylla* and *Acacia synchronicia* tall shrubland over open *Senna glutinosa* subsp. x *luerssenii* over *Maireana melanocoma* and *Enneapogon polyphyllus* chenopod shrubs and tussock grasses.

## SPECIES LIST

### Name

### Specimen

*Acacia aptaneura*  
*Acacia synchronicia*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Aristida inaequiglumis*  
*Dichanthium sericeum* subsp. *humilius*  
*Enneapogon polyphyllus*  
*Eragrostis xerophila*  
*Euphorbia biconvexa*  
*Gomphrena canescens*  
*Goodenia muelleriana*  
*Hakea preissii*  
*Heliotropium tenuifolium*  
*Maireana melanocoma*  
*Portulaca filifolia*  
*Ptilotus exaltatus*  
*Rhynchosia minima*  
*Senna glutinosa* subsp. x *luerssenii*  
*Senna* sp. Meekatharra (E. Bailey 1-26)  
*Sida fibulifera*  
*Tragus australianus*

WRP005.01

WRP095.02



## Western Ridge Pipeline

## Site WRP-102

**Date** 29/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
774897 mE; 7407979 mN  
119.6900 E -23.414944 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Granite  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Eremophila lachnocalyx*, *Senna artemisioides* subsp. *oligophylla* and *Rhagodia eremaea* mid to low sparse shrubland over *Eriachne flaccida*, *Enneapogon polyphyllus* and *Dichanthium sericeum* subsp. *humilius* low sparse tussock grassland with *Acacia aptaneura* and *Acacia tetragonophylla* tall scattered shrubs.

## SPECIES LIST

### Name

### Specimen

<i>Acacia aptaneura</i>	
<i>Aristida contorta</i>	
<i>Astrebla pectinata</i>	WRP102.02
* <i>Cenchrus ciliaris</i>	
<i>Corchorus tridens</i>	
<i>Cucumis melo</i>	WRP102.03
<i>Cynodon convergens</i>	WRP015.01
<i>Dichanthium sericeum</i> subsp. <i>humilius</i>	
<i>Enneapogon polyphyllus</i>	
<i>Eremophila lachnocalyx</i>	
<i>Eriachne flaccida</i>	
<i>Indigofera linifolia</i>	
<i>Neptunia dimorphantha</i>	WRP102.01
<i>Operculina aequisejala</i>	WRP102.04
<i>Rhagodia eremaea</i>	
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	
<i>Sida fibulifera</i>	
<i>Tephrosia</i> sp. Newman (A.A. Mitchell PRP 29)	WRP010.03
<i>Tribulus suberosus</i>	

**Western Ridge Pipeline**

**Site WRP-103**

**Date** 29/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone 50  
 775221 mE; 7408395 mN  
 119.6931 E -23.411134 S  
**Veg Condition** Excellent  
**Soil** Clay Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain



**Vegetation** Low open *Acacia aptaneura* and *Acacia tetragonophylla* over *Senna glutinosa* subsp. x *luerssenii* and *Eremophila ?platycalyx* over low open *Enneapogon polyphyllus*, *Eriachne mucronata* and *Triodia pungens* tussock and hummock grasses.

**SPECIES LIST**

**Name**

**Specimen**

<i>Abutilon macrum</i>	WRP103.02
<i>Acacia ?adsurgens</i>	WRP104.02
<i>Acacia aptaneura</i>	
<i>Acacia synchronicia</i>	
<i>Acacia tetragonophylla</i>	
<i>Anthobolus leptomerioides</i>	
* <i>Cenchrus ciliaris</i>	
<i>Enneapogon polyphyllus</i>	WRP019.04
<i>Eremophila ?platycalyx</i>	WRP047.01
<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	
<i>Eriachne mucronata</i>	
<i>Evolvulus alsinoides</i>	
<i>Gomphrena canescens</i>	
<i>Maireana melanocoma</i>	
<i>Paraneurachne muelleri</i>	
<i>Ptilotus obovatus</i> var. <i>obovatus</i>	
<i>Senna glutinosa</i>	WRP103.01
<i>Senna glutinosa</i> subsp. x <i>luerssenii</i>	
<i>Senna</i> sp. Meekatharra (E. Bailey 1-26)	
<i>Themeda triandra</i>	
<i>Tribulus suberosus</i>	



**Western Ridge Pipeline**

**Site WRP-104**

**Date** 29/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 775476 mE; 7408558 mN  
 119.6955 E -23.409624 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills  
**Vegetation** *Triodia wiseana* low hummock grassland with *Acacia inaequilatera*, *Grevillea berryana* and *Acacia ?adsurgens* mid to tall sparse shrubland.



**SPECIES LIST**

<b>Name</b>	<b>Specimen</b>
<i>Abutilon lepidum</i>	WRP104.03
<i>Acacia ?adsurgens</i>	WRP104.02
<i>Acacia bivenosa</i>	
<i>Acacia inaequilatera</i>	
<i>Acacia pruinocarpa</i>	
<i>Eremophila ?platycalyx</i>	WRP104.03
<i>Eremophila latrobei</i> subsp. <i>latrobei</i>	
<i>Grevillea berryana</i>	WRP104.01
<i>Indigofera monophylla</i>	
<i>Paraneurachne muelleri</i>	
<i>Ptilotus astrolasius</i>	
<i>Ptilotus polystachyus</i>	
<i>Tribulus suberosus</i>	
<i>Triodia wiseana</i>	

**Western Ridge Pipeline**

**Site WRP-105**

**Date** 29/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 774881 mE; 7408353 mN  
 119.6897 E -23.411576 S

**Veg Condition** Degraded

**Soil** Clay Loam

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Minor Drainage Line

**Vegetation** \**Cenchrus setiger*, \**Cenchrus ciliaris* and *Chrysopogon fallax* low tussock grassland with *Acacia aptaneura* and *Acacia sibirica* tall scattered shrubs.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia aptaneura*  
*Acacia sibirica*  
*Acacia tetragonophylla*  
 \**Bidens bipinnata*  
 \**Cenchrus ciliaris*  
 \**Cenchrus setiger*  
*Chrysopogon fallax*  
*Duperreya commixta*  
*Hakea lorea* subsp. *lorea*  
 \**Malvastrum americanum*



**Western Ridge Pipeline**

**Site WRP-106**

**Date** 29/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 775405 mE; 7408908 mN  
 119.6948 E -23.406474 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Triodia wiseana* low hummock grassland with *Acacia inaequilatera*, *Acacia pruinocarpa* and *Acacia ?adsurgens* mid to tall sparse shrubland over *Senna artemisioides* subsp. *oligophylla*, *Corchorus incanus* subsp. *lithophilus* and *Ptilotus astrolasius* low scattered shrubs.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia ?adsurgens*  
*Acacia inaequilatera*  
*Acacia pruinocarpa*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Corchorus incanus* subsp. *lithophilus*  
*Dipteracanthus australasicus* subsp. *australasicus*  
*Eremophila latrobei* subsp. *latrobei*  
*Euphorbia boophthona*  
*Ptilotus astrolasius*  
*Ptilotus obovatus* var. *obovatus*  
*Scaevola amblyanthera* var. *amblyanthera*  
*Senna artemisioides* subsp. *oligophylla*  
*Tribulus hirsutus*  
*Triodia wiseana*

WRP104.02

WRP046.02

**Western Ridge Pipeline**

**Site WRP-107**

**Date** 29/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
 774988 mE; 7408976 mN  
 119.6907 E -23.405933 S

**Veg Condition** Very Good

**Soil** Clay Loam

**Rock Type** BIF

**Fire Age** Old (6+ yr)

**Habitat** Sandy/ Stony Plain

**Vegetation** Low open *Acacia aptaneura* and *Acacia paraneura* shrubland with scattered *Corymbia hamersleyana* trees over *Triodia pungens* hummock grassland.



**SPECIES LIST**

**Name**

*Acacia ?adsurgens*  
*Acacia aptaneura*  
*Acacia paraneura*  
*Acacia pruinocarpa*  
*Aristida contorta*  
*Corymbia hamersleyana*  
*Enneapogon polyphyllus*  
*Eriachne pulchella*  
*Gomphrena canescens*  
*Goodenia muelleriana*  
*Hibiscus coatesii*  
*Pterocaulon sphacelatum*  
*Ptilotus astrolasius*  
*Senna glutinosa* subsp. x *luerssenii*  
*Solanum lasiophyllum*  
*Triodia pungens*

**Specimen**

WRP104.02

WRP019.04

CVopp.11



**Western Ridge Pipeline**

**Site WRP-108**

**Date** 29/03/2021  
**Described by** CvdB & MvW  
**Type** Relevé  
**Location** MGA Zone50  
 774227 mE; 7407983 mN  
 119.6834 E -23.415024 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Basalt Outcrops  
**Vegetation** *Triodia vanleeuwenii* low open hummock grassland with *Eremophila fraseri* subsp. *fraseri*, *Senna artemisioides* subsp. *oligophylla* and *Acacia adsurgens* mid to low sparse shrubland over *Themeda triandra*, *Eriachne mucronata* and *Enneapogon polyphyllus* low scattered tussock grasses.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia adsurgens*  
*Cucumis variabilis*  
*Enneapogon polyphyllus*  
*Eremophila fraseri* subsp. *fraseri*  
*Eriachne mucronata*  
*Santalum lanceolatum*  
*Senna artemisioides* subsp. *oligophylla*  
*Themeda triandra*  
*Tribulus suberosus*  
*Triodia vanleeuwenii*

WRP108.02

WRP108.01

**Western Ridge Pipeline**

**Site WRP-109**

**Date** 29/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
 775089 mE; 7408756 mN  
 119.6917 E -23.407900 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain  
**Vegetation** Open *Acacia ?adsurgens* and *Acacia sibirica* over *Triodia pungens* and *Enneapogon polyphyllus* hummock and tussock grasses.



**SPECIES LIST**

**Name**

*Acacia ?adsurgens*  
*Acacia sibirica*  
*Aristida inaequiglumis*  
*\*Bidens bipinnata*  
*Cheilanthes sieberi*  
*Chrysopogon fallax*  
*Dichanthium sericeum* subsp. *humilius*  
*Digitaria brownii*  
*Evolvulus alsinoides*  
*Gomphrena canescens*  
*Hibiscus burtonii*  
*Sporobolus australasicus*  
*Themeda triandra*  
*Triodia pungens*

**Specimen**

WRP109.01  
 WRP109.02

WRP010.04



**Western Ridge Pipeline**

**Site WRP-110**

**Date** 30/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 773830 mE; 7408091 mN  
 119.6795 E -23.414114 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Triodia angusta* and *Triodia wiseana* low hummock grassland with *Acacia synchronicia*, *Acacia bivenosa* and *Acacia sibirica* mid to tall scattered shrubs with *Eucalyptus gamophylla* low scattered mallee trees.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia aptaneura*  
*Acacia bivenosa*  
*Acacia sibirica*  
*Acacia synchronicia*  
*Duperreya commixta*  
*Eucalyptus gamophylla*  
*Goodenia vilmorinae*  
*Indigofera monophylla*  
*Paraneurachne muelleri*  
*Ptilotus obovatus* var. *obovatus*  
*Senna artemisioides* subsp. *oligophylla*  
*Senna glutinosa* subsp. *x. luerksenii*  
*Tribulus suberosus*  
*Triodia angusta*  
*Triodia wiseana*

**Western Ridge Pipeline**

**Site WRP-111**

**Date** 30/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
 773632 mE; 7407916 mN  
 119.6776 E -23.415723 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Footslope



**Vegetation** Mid dense *Triodia angusta* and *Triodia wiseana* hummock grassland with open low *Acacia bivenosa* and *Acacia synchronicia* shrubland.

**SPECIES LIST**

Name	Specimen
<i>Acacia synchronicia</i>	
<i>Corchorus incanus</i> subsp. <i>lithophilus</i>	WRP046.02
<i>Corchorus laniflorus</i>	
<i>Eriachne mucronata</i>	
<i>Goodenia muelleriana</i>	
<i>Indigofera monophylla</i>	
<i>Paraneurachne muelleri</i>	
<i>Pterocaulon sphacelatum</i>	
<i>Ptilotus exaltatus</i>	
<i>Ptilotus polystachyus</i>	
<i>Scaevola amblyanthera</i> var. <i>centralis</i>	WRP005.04
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	
<i>Tribulus hirsutus</i>	
<i>Tribulus suberosus</i>	
<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	
<i>Triodia angusta</i>	
<i>Triodia wiseana</i>	



## Western Ridge Pipeline

## Site WRP-116

**Date** 30/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
773559 mE; 7408907 mN  
119.6767 E -23.406795 S

**Veg Condition** Good

**Soil** Clayey Sand

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Drainage Area/ Floodplain

**Vegetation** *Acacia aptaneura* and *Acacia rhodophloia* x *sibirica* low open woodland over *Enneapogon polyphyllus*, *Chrysopogon fallax*, *Dactyloctenium radulans* and *Perotis rara* low open tussock grassland.



## SPECIES LIST

### Name

### Specimen

<i>Abutilon otocarpum</i>	
<i>Acacia rhodophloia</i> x <i>sibirica</i>	WRP116.02
<i>Arivela viscosa</i>	
* <i>Bidens bipinnata</i>	
<i>Bulbostylis barbata</i>	WRP116.01
* <i>Cenchrus ciliaris</i>	
<i>Chrysopogon fallax</i>	
<i>Corchorus tridens</i>	
<i>Dactyloctenium radulans</i>	
<i>Dichanthium sericeum</i> subsp. <i>humilius</i>	
<i>Enneapogon polyphyllus</i>	
<i>Eriachne mucronata</i>	
<i>Goodenia muelleriana</i>	
<i>Hakea lorea</i> subsp. <i>lorea</i>	
<i>Hibiscus sturtii</i> var. <i>campylochlamys</i>	WRP005.03
<i>Iseilema membranaceum</i>	
* <i>Malvastrum americanum</i>	
<i>Paspalidium constrictum</i>	WRP112.01
<i>Perotis rara</i>	
<i>Polycarpaea corymbosa</i>	WRP096.01
<i>Ptilotus helipteroides</i>	
<i>Sida fibulifera</i>	
<i>Sporobolus australasicus</i>	
<i>Tragus australianus</i>	WRP095.02

**Western Ridge Pipeline**

**Site WRP-117**

**Date** 30/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 773043 mE; 7408886 mN  
 119.6717 E -23.407069 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills



**Vegetation** *Triodia vanleeuwenii* and *Triodia angusta* low hummock grassland with *Acacia bivenosa*, *Senna* sp. Meekatharra (E. Bailey 1-26) and *Acacia synchronicia* mid to tall sparse shrubland with *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia bivenosa*  
*Acacia synchronicia*  
*Eriachne pulchella* subsp. *pulchella*  
*Eucalyptus leucophloia* subsp. *leucophloia*  
*Ptilotus astrolasius*  
*Ptilotus obovatus* var. *obovatus*  
*Senna artemisioides* subsp. *oligophylla*  
*Senna glutinosa* subsp. x *luerssenii*  
*Senna* sp. Meekatharra (E. Bailey 1-26)  
*Triodia angusta*  
*Triodia vanleeuwenii*



## Western Ridge Pipeline

Site WRP-118

**Date** 30/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
772736 mE; 7408594 mN  
119.6687 E -23.409758 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills



**Vegetation** *Triodia wiseana*, *Triodia angusta* low hummock grassland with *Acacia bivenosa* (wispy) tall sparse shrubland with *Eucalyptus leucophloia* subsp. *leucophloia* and occasional *Eucalyptus socialis* subsp. *eucentrica* low scattered trees.

## SPECIES LIST

### Name

*Acacia bivenosa*  
*Acacia tetragonophylla*  
*Eucalyptus leucophloia* subsp. *leucophloia*  
*Eucalyptus socialis* subsp. *eucentrica*  
*Jasminum didymum* subsp. *lineare*  
*Triodia angusta*  
*Triodia wiseana*

### Specimen

## Western Ridge Pipeline

## Site WRP-119

**Date** 30/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone 50  
772675 mE; 7408925 mN  
119.6681 E -23.406780 S

**Veg Condition** Very Good

**Soil** Clay Loam

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Drainage Area/ Floodplain

**Vegetation** Open low *Acacia incurvaneura* and *Acacia tetragonophylla* shrubs over tussock grasses of *\*Cenchrus ciliaris*, *Enneapogon polyphyllus* and *Chrysopogon fallax*, and *Triodia pungens* hummock grasses.



## SPECIES LIST

### Name

### Specimen

*Abutilon* sp. Indet  
*Acacia inaequilatera*  
*Acacia incurvaneura*  
*Acacia tetragonophylla*  
*Arivela viscosa*  
*\*Bidens bipinnata*  
*\*Cenchrus ciliaris*  
*Chrysopogon fallax*  
*Enneapogon polyphyllus*  
*Euphorbia biconvexa*  
*Evolvulus alsinoides*  
*Goodenia muelleriana*  
*Iseilema membranaceum*  
*Kennedia prorepens*  
*Ptilotus exaltatus*  
*Rhagodia eremaea*  
*Sida fibulifera*  
*Sporobolus australasicus*  
*Triodia pungens*

WRP119.01

WRP019.04



**Western Ridge Pipeline**

**Site WRP-120**

**Date** 30/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 772980 mE; 7408365 mN  
 119.6712 E -23.411788 S

**Veg Condition** Poor

**Soil** Silty Clay Loam

**Rock Type** Dolerite

**Fire Age** Old (6+ yr)

**Habitat** Boulders/ Rockpiles

**Vegetation** *Acacia aptaneura* and *Acacia tetragonophylla* tall sparse shrubland over *\*Cenchrus ciliaris* low sparse tussock grassland over herbs dominated by *Trianthema triquetrum* and *Boerhavia coccinea*.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia aptaneura*  
*Acacia synchronicia*  
*Acacia tetragonophylla*  
*Boerhavia coccinea*  
*\*Cenchrus ciliaris*  
*Cucumis variabilis*  
*Cynodon prostratus*  
*Eremophila latrobei*  
*Eriachne mucronata*  
*Rhagodia eremaea*  
*Senna artemisioides* subsp. *helmsii*  
*Senna glutinosa* subsp. *x luerksenii*  
*Trianthema triquetrum*  
*Vincetoxicum flexuosum*

WRC20-02

**Western Ridge Pipeline**

**Site WRP-121**

**Date** 30/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone 50  
 772812 mE; 7407894 mN  
 119.6696 E -23.416066 S

**Veg Condition** Degraded

**Soil** Clay Loam

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Drainage Area/ Floodplain

**Vegetation** Open *Acacia tetragonophylla*, *Acacia ?adsurgens* and *Acacia sibirica* tall Shrubland over mid tussock grasses of *\*Cenchrus ciliaris* and *Triodia pungens* hummock grasses.



**SPECIES LIST**

**Name**

**Specimen**

<i>Acacia ?adsurgens</i>	WRP023.01
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	
<i>Acacia sibirica</i>	WRP004.01
<i>Acacia tetragonophylla</i>	
<i>Aristida inaequiglumis</i>	WRP005.01
<i>Arivela viscosa</i>	
<i>*Bidens bipinnata</i>	
<i>*Cenchrus ciliaris</i>	
<i>*Cenchrus setiger</i>	
<i>Chrysopogon fallax</i>	
<i>Dactyloctenium radulans</i>	
<i>Enneapogon polyphyllus</i>	WRP019.04
<i>Eremophila lachnocalyx</i>	
<i>Evolvulus alsinoides</i>	
<i>Iseilema membranaceum</i>	
<i>Portulaca filifolia</i>	
<i>Ptilotus exaltatus</i>	
<i>Ptilotus obovatus</i> var. <i>obovatus</i>	
<i>Rhagodia eremaea</i>	
<i>Sida fibulifera</i>	
<i>Sporobolus australasicus</i>	
<i>Triodia pungens</i>	



**Western Ridge Pipeline**

**Site WRP-122**

**Date** 30/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 773504 mE; 7408461 mN  
 119.6763 E -23.410827 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills



**Vegetation** *Triodia wiseana* low hummock grassland with *Acacia adsurgens*, *Senna glutinosa* subsp. x *luerssenii* and *Acacia tetragonophylla* mid sparse shrubland with *Acacia inaequilatera* and *Hakea lorea* subsp. *lorea* tall scattered shrubs.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia adsurgens*  
*Acacia inaequilatera*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Hakea lorea* subsp. *lorea*  
*Paraneurachne muelleri*  
*Senna glutinosa* subsp. x *luerssenii*  
*Sporobolus australasicus*  
*Triodia wiseana*

**Western Ridge Pipeline**

**Site WRP-123**

**Date** 30/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone 50  
 773319 mE; 7408068 mN  
 119.6745 E -23.414405 S

**Veg Condition** Degraded

**Soil** Light Clay

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Drainage Area/ Floodplain

**Vegetation** Low shrubland of *Acacia ?adsurgens* and *Acacia tetragonophylla* over mid tussock grassland of *\*Cenchrus ciliaris* and *Dactyloctenium radulans*.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia ?adsurgens*

WRP023.01

*Acacia inaequilatera*

*Acacia pachyacra*

*Acacia tetragonophylla*

*Arivela viscosa*

*Boerhavia coccinea*

*\*Cenchrus ciliaris*

*\*Cenchrus setiger*

*Chrysopogon fallax*

*Dactyloctenium radulans*

*Duperreya commixta*

*Enneapogon polyphyllus*

WRP019.04

*Euphorbia biconvexa*

*Evolvulus alsinoides* var. *villosicalyx*

*Hakea lorea* subsp. *lorea*

*Hibiscus sturtii* var. *campylochlamys*

WRP005.03

*Iseilema membranaceum*

*Ptilotus exaltatus*

*Ptilotus obovatus* var. *obovatus*

*Rhynchosia minima*

*Sporobolus australasicus*



**Western Ridge Pipeline**

**Site WRP-124**

**Date** 30/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 773900 mE; 7408398 mN  
 119.6801 E -23.411331 S

**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Granite  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills

**Vegetation** *Triodia wiseana* low hummock grassland with *Acacia bivenosa*, *Acacia inaequilatera* and *Hakea lorea* subsp. *lorea* tall scattered shrubs.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia inaequilatera*  
*Duperreya commixta*  
*Eremophila fraseri* subsp. *fraseri*  
*Hakea lorea* subsp. *lorea*  
*Ptilotus obovatus* var. *obovatus*  
*Ptilotus polystachyus*  
*Ptilotus rotundifolius*  
*Senna artemisioides* subsp. *oligophylla*  
*Senna glutinosa* subsp. *pruinosa*  
*Senna glutinosa* subsp. x *luerssenii*  
*Triodia wiseana*

**Western Ridge Pipeline**

**Site WRP-125**

**Date** 30/03/2021  
**Described by** MvW  
**Type** Relevé  
**Location** MGA Zone50  
 773646 mE; 7408204 mN  
 119.6777 E -23.413128 S  
**Veg Condition** Excellent  
**Soil** Clay Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Hillcrest/ Upper Hillslope  
**Vegetation** Open *Triodia wiseana* hummock grassland with open low *Eremophila fraseri* subsp. *fraseri* and *Ptilotus rotundifolius* with emergent *Acacia inaequilatera* trees.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia inaequilatera*  
*Acacia tetragonophylla*  
*Aristida contorta*  
*Corchorus incanus* subsp. *lithophilus*  
*Enneapogon polyphyllus*  
*Eremophila fraseri* subsp. *fraseri*  
*Indigofera monophylla*  
*Ptilotus rotundifolius*  
*Senna artemisioides* subsp. *helmsii*  
*Tribulus hirsutus*  
*Triodia pungens*  
*Triodia wiseana*



**Western Ridge Pipeline**

**Site WRP-126**

**Date** 30/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 774162 mE; 7408326 mN  
 119.6827 E -23.411938 S  
**Veg Condition** Excellent  
**Soil** Silty Loam  
**Rock Type** Granite  
**Fire Age** Old (6+ yr)  
**Habitat** Hillslope



**Vegetation** *Triodia wiseana* low hummock grassland with *Acacia inaequilatera*, *Hakea lorea* subsp. *lorea* and *Acacia tetragonophylla* mid to tall scattered shrubs with *Eucalyptus gamophylla* low scattered trees.

**SPECIES LIST**

**Name**

**Specimen**

*Acacia bivenosa*  
*Acacia inaequilatera*  
*Acacia tetragonophylla*  
*Eucalyptus gamophylla*  
*Hakea chordophylla*  
*Hakea lorea* subsp. *lorea*  
*Ptilotus astrolasius*  
*Ptilotus clementii*  
*Tribulus hirsutus*  
*Triodia wiseana*

**Western Ridge Pipeline**

**Site WRP-127**

**Date** 31/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 774058 mE; 7408765 mN  
 119.6816 E -23.407997 S

**Veg Condition** Good

**Soil** Silty Clay Loam

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Drainage Area/ Floodplain

**Vegetation** *Acacia aptaneura* low open woodland over *Digitaria ctenantha*, *Chrysopogon fallax* and *Enneapogon polyphyllus* low open tussock grassland with *Abutilon lepidum*, *Hibiscus sturtii* var. *campylochlamys* and *Evolvulus alsinoides* var. *decumbens* scattered low shrubs and herbs.



**SPECIES LIST**

**Name**

**Specimen**

<i>Abutilon cryptopetalum</i>	
<i>Abutilon lepidum</i>	WRP004.03
<i>Acacia aptaneura</i>	
<i>Aristida contorta</i>	
<i>Arivela viscosa</i>	
* <i>Bidens bipinnata</i>	
* <i>Cenchrus ciliaris</i>	
<i>Chrysopogon fallax</i>	
<i>Dactyloctenium radulans</i>	
<i>Digitaria ctenantha</i>	WRP019.03
<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	
<i>Enneapogon polyphyllus</i>	WRP019.04
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	
<i>Gomphrena canescens</i>	
<i>Hibiscus burtonii</i>	WRP010.04
<i>Hibiscus sturtii</i> var. <i>campylochlamys</i>	WRP005.03
<i>Iseilema membranaceum</i>	
<i>Paspalidium constrictum</i>	WRP112.01
<i>Perotis rara</i>	
<i>Ptilotus exaltatus</i>	
<i>Ptilotus helipteroides</i>	
<i>Rhagodia eremaea</i>	
<i>Sporobolus australasicus</i>	
<i>Triodia pungens</i>	



**Western Ridge Pipeline**

**Site WRP-128**

**Date** 31/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
 774274 mE; 7408938 mN  
 119.6837 E -23.406395 S

**Veg Condition** Excellent  
**Soil** Clay Loam  
**Rock Type** Granite  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills

**Vegetation** *Triodia angusta* and *Triodia wiseana* low hummock grassland with *Acacia bivenosa*, *Acacia synchronicia* and *Senna glutinosa* subsp. x *luerssenii* mid to tall scattered shrubs with *Eucalyptus socialis* subsp. *eucentrica* low scattered trees.



**SPECIES LIST**

**Name**

**Specimen**

*Acacia bivenosa*  
*Acacia synchronicia*  
*Acacia tetragonophylla*  
*Duperreya commixta*  
*Enneapogon polyphyllus*  
*Eucalyptus socialis* subsp. *eucentrica*  
*Ptilotus obovatus* var. *obovatus*  
*Senna artemisioides* subsp. *oligophylla*  
*Senna glutinosa* subsp. x *luerssenii*  
*Senna* sp. Meekatharra (E. Bailey 1-26)  
*Triodia angusta*  
*Triodia wiseana*

## Western Ridge Pipeline

Site WRP-129

**Date** 31/03/2021  
**Described by** CvdB  
**Type** Relevé  
**Location** MGA Zone50  
774500 mE; 7408709 mN  
119.6860 E -23.408427 S

**Veg Condition** Poor

**Soil** Sandy Clay Loam

**Rock Type** None Discernible

**Fire Age** Old (6+ yr)

**Habitat** Drainage Area/ Floodplain

**Vegetation** *Acacia aptaneura* low open woodland over *Digitaria ctenantha*, *Chrysopogon fallax* and *Enneapogon polyphyllus* low open tussock grassland with *\*Bidens bipinnata*, *Hibiscus sturtii* var. *campylochlamys* and *Abutilon lepidum* low scattered herbs and shrubs.



## SPECIES LIST

### Name

### Specimen

<i>Abutilon fraseri</i> subsp. <i>fraseri</i>	WRP129.01
<i>Abutilon lepidum</i>	WRP004.03
<i>Acacia aptaneura</i>	
<i>Acacia tetragonophylla</i>	
<i>Aristida inaequiglumis</i>	
<i>*Bidens bipinnata</i>	WRP005.01
<i>*Cenchrus ciliaris</i>	
<i>Chrysopogon fallax</i>	
<i>Corymbia candida</i> subsp. <i>dipsodes</i>	
<i>Dactyloctenium radulans</i>	
<i>Digitaria ctenantha</i>	WRP019.03
<i>Enneapogon polyphyllus</i>	WRP019.04
<i>Eriachne mucronata</i>	
<i>Euphorbia biconvexa</i>	
<i>Hibiscus sturtii</i> var. <i>campylochlamys</i>	WRP005.03
<i>Iseilema membranaceum</i>	
<i>Kennedia prorepens</i>	
<i>Paraneurachne muelleri</i>	
<i>Paspalidium constrictum</i>	WRP112.01
<i>Perotis rara</i>	
<i>Ptilotus helipteroides</i>	
<i>Ptilotus polystachyus</i>	
<i>Senna artemisioides</i> subsp. <i>helmsii</i>	
<i>Sida fibulifera</i>	
<i>Triodia pungens</i>	



## Western Ridge Pipeline

Site PDP-001

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
758344 mE; 7401749 mN  
119.529237 E -  
23.473867 S  
**Veg Condition** Excellent  
**Soil** Sandy Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Hillslope  
**Vegetation** *Triodia wiseana* hummock grassland with *Eucalyptus leucophloia* low scattered trees over *Acacia aptaneura* tall open shrubland.



## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Abutilon macrum</i>				PDP01-03
<i>Acacia aptaneura</i>				PDP01-02
<i>Acacia sibirica</i>				
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>*Bidens bipinnata</i>				
<i>Duperreya commixta</i>				
<i>Eremophila cuneifolia</i>				
<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>				
<i>Rhagodia eremaea</i>				
<i>Senna artemisioides</i> subsp. <i>helmsii</i>				
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>				
<i>Triodia pungens</i>				
<i>Triodia wiseana</i>				PDP01-01

**Western Ridge Pipeline**
**Site PDP-002**

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
758216 mE; 7401682 mN  
119.527998 E -  
23.474500 S  
**Veg Condition** Very Good  
**Soil** Sandy Clay Loam  
**Rock Type** Quartz  
**Fire Age** Moderate (3 to 5 yr)  
**Habitat** Sandy/ Stony Plain  
**Vegetation** *Triodia wiseana* open hummock grassland with *Eucalyptus leucophloia* low scattered trees over *Acacia synchronicia* and *Eremophila cuneifolia* open shrubland.


**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Eremophila cuneifolia</i>				PDP-02-01
<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>				
<i>Hakea preissii</i>				
<i>Maireana tomentosa</i>				
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>				PDP-02-02
<i>Tecticornia</i> sp. indet				
<i>Triodia wiseana</i>				



**Western Ridge Pipeline**

**Site PDP-003**

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 757746 mE; 7401689 mN  
 119.523399 E -  
 23.474509 S  
**Veg Condition** Excellent  
**Soil** Sandy Clay Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills  
**Vegetation** *Triodia wiseana* open hummock grassland with *Hakea leuoptera* subsp. *sericipes*, *Acacia synchronicia* and *Acacia tetragonophylla* open shrubland over *Eremophila cuneifolia* low open shrubland.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Eremophila cuneifolia</i>				
<i>Hakea leuoptera</i> subsp. <i>sericipes</i>				PDP03-02
<i>Maireana</i> sp. indet				PDP03-01
<i>Maireana tomentosa</i>				
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>				
<i>Triodia wiseana</i>				

**Western Ridge Pipeline**

**Site PDP-004**

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 756807 mE; 7401791 mN  
 119.514194 E -  
 23.473732 S  
**Veg Condition** Very Good  
**Soil** Sand  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain  
**Vegetation** Chenopod low open shrubland with *Hakea preissii* and *Acacia synchronicia* scattered shrubs and *Eremophila cuneifolia* and *Eremophila forrestii* low scattered shrubs.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia synchronicia</i>				
<i>Aristida contorta</i>				
<i>Chenopodiaceae</i> sp. indet				PDP-04-04
<i>Cynodon prostratus</i>				PDP-04-03
<i>Enneapogon polyphyllus</i>				WRC308-09
<i>Eremophila cuneifolia</i>				PDP-02-01
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>				
<i>Frankenia</i> sp. indet				PDP-04-01
<i>Goodenia muelleriana</i>				PDP-04-05
<i>Hakea preissii</i>				
<i>Maireana</i> sp. indet				
<i>Maireana tomentosa</i>				
<i>Oxychloris scariosa</i>				PDP-04-07
<i>Portulaca pilosa</i>				
<i>Sclerolaena ? eriacantha</i>				PDP-04-06
<i>Sclerolaena cuneata</i>				PDP-04-02
<i>Tecticornia</i> sp. indet				



**Western Ridge Pipeline**

**Site PDP-005**

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 756734 mE; 7401883 mN  
 119.513463 E -  
 23.472919 S  
**Veg Condition** Excellent  
**Soil** Clay Loam  
**Rock Type** None Discernible  
**Fire Age** Old (6+ yr)  
**Habitat** Claypan  
**Vegetation** *Triodia longiceps* hummock grassland with *Acacia aptaneura* and *Acacia synchronicia* tall open shrubland over mixed low open shrubland.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Abutilon macrum</i>				PDP01-03
<i>Acacia aptaneura</i>				
<i>Acacia synchronicia</i>				
<i>Chrysopogon fallax</i>				
<i>Eragrostis eriopoda</i>				
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>				
<i>Eremophila maculata</i> subsp. <i>brevifolia</i>				
<i>Eriachne pulchella</i>				
<i>Fimbristylis dichotoma</i>				
<i>Hibiscus sturtii</i> var. <i>campylochlamys</i>				
<i>Maireana</i> sp. indet				PDP03-01
<i>Ptilotus obovatus</i> var. <i>obovatus</i>				
<i>Scaevola spinescens</i>				
<i>Senna hamersleyensis</i>				PDP05-01
<i>Solanum ?lasiophyllum</i>				WRC304-13
<i>Triodia longiceps</i>				
<i>Triodia wiseana</i>				

## Western Ridge Pipeline

Site PDP-006

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
757183 mE; 7401988 mN  
119.517840 E -  
23.471895 S  
**Veg Condition** Good  
**Soil** Sand  
**Rock Type** Quartz  
**Fire Age** Moderate (3 to 5 yr)  
**Habitat** Minor Drainage Line  
**Vegetation** *Triodia angusta* hummock grassland with *Acacia aptaneura* tall open shrubland and *Acacia tetragonophylla* low open shrubland.



## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				PDP-06-01
<i>Acacia tetragonophylla</i>				
<i>Amyema fitzgeraldii</i>				
* <i>Bidens bipinnata</i>				
* <i>Cenchrus setiger</i>				
* <i>Citrullus amarus</i>				WRC306-03
<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>				PDP-06-03
<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>				
<i>Malvastrum americanum</i>				
<i>Portulaca pilosa</i>				
<i>Ptilotus obovatus</i> var. <i>obovatus</i>				
<i>Triodia angusta</i>				PDP-06-02



**Western Ridge Pipeline**

**Site PDP-007**

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 757855 mE; 7401914 mN  
 119.524421 E -  
 23.472462 S  
**Veg Condition** Excellent  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Drainage Area/ Floodplain  
**Vegetation** *Triodia angusta*, *Triodia pungens* and *Triodia wiseana* hummock grassland with *Acacia aptaneura*, *Acacia tetragonophylla* and *Acacia synchronicia* tall shrubland and *Eucalyptus leucophloia* low scattered trees.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Chrysopogon fallax</i>				
<i>Duperreya commixta</i>				
<i>Eremophila cuneifolia</i>				
<i>Eremophila latrobei</i> subsp. <i>filiformis</i>				
<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>				
<i>Paraneurachne muelleri</i>				WRC307-10
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>				
<i>Sida</i> sp. dark green fruits (S. van Leeuwen 2260)				PDP07-01
<i>Themeda triandra</i>				
<i>Triodia angusta</i>				
<i>Triodia pungens</i>				
<i>Triodia wiseana</i>				

**Western Ridge Pipeline**

**Site PDP-008**

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 757456 mE; 7401758 mN  
 119.520543 E -  
 23.473932 S  
**Veg Condition** Very Good  
**Soil** Sand  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain  
**Vegetation** Chenopod low open shrubland with *Eremophila cuneifolia* low scattered shrubs.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
Chenopodiaceae sp. indet				PDP-04-04
<i>Eremophila cuneifolia</i>				PDP-02-01
<i>Frankenia</i> sp. indet				PDP-04-01
<i>Maireana</i> sp. indet				
<i>Portulaca pilosa</i>				
<i>Sclerolaena ?eriacantha</i>				PDP-04-06
<i>Sclerolaena cuneata</i>				PDP-04-02
<i>Sporobolus actinocladius</i>				PDP-08-01
<i>Tecticornia</i> sp. indet				



**Western Ridge Pipeline**
**Site PDP-009**

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
758094 mE; 7401975 mN  
119.526750 E -  
23.471875 S  
**Veg Condition** Excellent  
**Soil** Sandy Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills  
**Vegetation** *Triodia wiseana* and *Triodia longiceps* hummock grassland with *Melaleuca eleuterostachya*, *Acacia synchronicia* and *Acacia tetragonophylla* open shrubland.


**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Duperreya commixta</i>				
<i>Enneapogon caeruleus</i>				
<i>Eucalyptus trivalva</i>				PDP09-01
<i>Maireana villosa</i>				
<i>Melaleuca eleuterostachya</i>				
<i>Ptilotus exaltatus</i>				
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>				
<i>Senna symonii</i>				
<i>Sida fibulifera</i>				
<i>Triodia longiceps</i>				
<i>Triodia wiseana</i>				

**Western Ridge Pipeline**

**Site PDP-010**

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 765102 mE; 7401820 mN  
 119.595330 E -  
 23.472139 S  
**Veg Condition** Very Good  
**Soil** Clayey Sand  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Minor Drainage Line  
**Vegetation** *Acacia macraneura* tall shrubland over *Acacia tetragonophylla* and *Acacia sclerosperma* subsp. *sclerosperma* open shrubland over *Themeda triandra* and *Paraneurachne muelleri* open tussock grassland.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia macraneura</i>				WRC305-03
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>				
<i>Acacia tetragonophylla</i>				
<i>Amphipogon sericeus</i>				
<i>Chrysopogon fallax</i>				
<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>				
<i>Indigofera monophylla</i>				
<i>Paraneurachne muelleri</i>				
<i>Ptilotus obovatus</i> var. <i>obovatus</i>				
<i>Senna artemisioides</i> subsp. <i>helmsii</i>				
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>				
<i>Senna</i> sp. Meekatharra (E. Bailey 1-26)				
<i>Themeda triandra</i>				
<i>Triodia pungens</i>				WRC308-07



**Western Ridge Pipeline**

**Site PDP-011**

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 765538 mE; 7401871 mN  
 119.599594 E -  
 23.471613 S  
**Veg Condition** Excellent  
**Soil** Sandy Clay Loam  
**Rock Type** Quartz  
**Fire Age** Moderate (3 to 5 yr)  
**Habitat** Stony Plain  
**Vegetation** *Acacia pruinocarpa*, *Acacia synchronicia* and *Acacia tetragonophylla* tall shrubland over mixed *Senna* open shrubland over *Amphipogon sericeus* open tussock grassland.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				
<i>Acacia pruinocarpa</i>				
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Amphipogon sericeus</i>				
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>				
<i>Maireana villosa</i>				
<i>Ptilotus obovatus</i> var. <i>obovatus</i>				
<i>Senna artemisioides</i> subsp. <i>helmsii</i>				
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>				
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>				
<i>Senna</i> sp. Meekatharra (E. Bailey 1-26)				PDP11-01
<i>Tribulus suberosus</i>				

**Western Ridge Pipeline**

**Site PDP-012**

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 765014 mE; 7401968 mN  
 119.594447 E -  
 23.470825 S  
**Veg Condition** Very Good  
**Soil** Clayey Sand  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain  
**Vegetation** *Triodia wiseana* and *Triodia longiceps* open hummock grassland with *Acacia synchronicia* scattered shrubs over *Eremophila cuneifolia* low scattered shrubs.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Eremophila cuneifolia</i>				
<i>Santalum lanceolatum</i>				
<i>Senna artemisioides</i> subsp. <i>helmsii</i>				
<i>Senna glutinosa</i> subsp. <i>x luerksenii</i>				
<i>Triodia longiceps</i>				
<i>Triodia wiseana</i>				



**Western Ridge Pipeline**

**Site PDP-013**

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 764460 mE; 7401865 mN  
 119.589048 E -  
 23.471840 S  
**Veg Condition** Excellent  
**Soil** Sandy Clay Loam  
**Rock Type** None Discernible  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills  
**Vegetation** *Triodia vanleeuwenii* open hummock grassland with *Acacia pruinocarpa*, *Acacia aptaneura* and *Acacia ancistrocarpa* tall shrubland over *Acacia tetragonophylla* and *Eremophila forrestii* open shrubland.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia ancistrocarpa</i>				PDP13-01
<i>Acacia aptaneura</i>				
<i>Acacia ayersiana</i>				PDP13-02
<i>Acacia pruinocarpa</i>				
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Eragrostis eriopoda</i>				
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>				
<i>Eremophila latrobei</i> subsp. <i>filiformis</i>				
<i>Hakea lorea</i> subsp. <i>lorea</i>				
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>				
<i>Triodia vanleeuwenii</i>				

**Western Ridge Pipeline**

**Site PDP-014**

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 765049 mE; 7402102 mN  
 119.594768 E -  
 23.469604 S  
**Veg Condition** Very Good  
**Soil** Clayey Sand  
**Rock Type** None Discernible  
**Fire Age** Old (6+ yr)  
**Habitat** Drainage Area/ Floodplain  
**Vegetation** *Triodia longiceps* hummock grassland with *Acacia aptaneura* and *Acacia sclerosperma* subsp. *sclerosperma* tall open shrubland.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				PDP-14-01
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>				
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Maireana tomentosa</i>				
<i>Rhagodia eremaea</i>				
<i>Triodia longiceps</i>				PDP-14-02



## Western Ridge Pipeline

Site PDP-015

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
764629 mE; 7401920 mN  
119.590689 E -  
23.471313 S  
**Veg Condition** Excellent  
**Soil** Sandy Clay Loam  
**Rock Type** None Discernible  
**Fire Age** Old (6+ yr)  
**Habitat** Drainage Area/ Floodplain  
**Vegetation** *Triodia pungens* open hummock grassland with *Acacia aptaneura* and *Acacia pruinocarpa* tall shrubland over *Eremophila forrestii* open shrubland.



## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				
<i>Acacia pruinocarpa</i>				
<i>Aristida obscura</i>				PDP15-01
<i>Duperreya commixta</i>				
<i>Eragrostis eriopoda</i>				
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>				
<i>Eremophila fraseri</i> subsp. <i>fraseri</i>				
<i>Maireana villosa</i>				
<i>Ptilotus exaltatus</i>				
<i>Rhagodia eremaea</i>				
<i>Senna artemisioides</i> subsp. <i>helmsii</i>				
<i>Sida</i> sp. dark green fruits (S. van Leeuwen 2260)				PDP07-01
<i>Tribulus suberosus</i>				
<i>Triodia pungens</i>				
<i>Triodia vanleeuwenii</i>				

**Western Ridge Pipeline**

**Site PDP-016**

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 765859 mE; 7402102 mN  
 119.602685 E -  
 23.469477 S  
**Veg Condition** Good  
**Soil** Sandy Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Medium Drainage Line  
**Vegetation** \**Cenchrus ciliaris* tussock grassland with *Acacia citrinoviridis* and *Eucalyptus victrix* woodland over mixed low open shrubland.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia citrinoviridis</i>				
* <i>Bidens bipinnata</i>				
* <i>Cenchrus ciliaris</i>				
* <i>Cenchrus setiger</i>				
<i>Cheilanthes sieberi</i>				
* <i>Citrullus amarus</i>				WRC306-03
<i>Corchorus tridens</i>				
<i>Duperreya commixta</i>				
<i>Eremophila latrobei</i> subsp. <i>filiformis</i>				
<i>Eucalyptus victrix</i>				
* <i>Malvastrum americanum</i>				
<i>Marsilea drummondii</i>				WRC304-07
<i>Rhynchosia minima</i>				
* <i>Vachellia farnesiana</i>				



## Western Ridge Pipeline

Site PDP-017

**Date** 12/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
765701 mE; 7401891 mN  
119.601178 E -  
23.471407 S  
**Veg Condition** Excellent  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain  
**Vegetation** *Acacia tetragonophylla* and *Acacia synchronicia* tall shrubland with *Acacia aptaneura* low open woodland over *Senna artemisioides* subsp. *helmsii*, *Senna* sp. Meekatharra (E. Bailey 1-26) and *Ptilotus obovatus* var. *obovatus* open shrubland over *Amphipogon sericeus*



## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Amphipogon sericeus</i>				
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>				
<i>Gomphrena canescens</i>				WRC308-02
<i>Ptilotus obovatus</i> var. <i>obovatus</i>				
<i>Sclerolaena cornishiana</i>				PDP17-02
<i>Senna artemisioides</i> subsp. <i>helmsii</i>				
<i>Senna</i> sp. Meekatharra (E. Bailey 1-26)				PDP11-01

**Western Ridge Pipeline**

**Site PDP-018**

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 760929 mE; 7401938 mN  
 119.554492 E -  
 23.471748 S  
**Veg Condition** Very Good  
**Soil** Sand  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain  
**Vegetation** *Triodia longiceps* open hummock grassland with *Acacia macraneura*, *Acacia synchronicia* and *Hakea lorea* subsp. *lorea* tall open shrubland.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia macraneura</i>				PDP-18-01
<i>Acacia synchronicia</i>				
<i>Boerhavia</i> sp. indet				
* <i>Cenchrus ciliaris</i>				
* <i>Cenchrus setiger</i>				
<i>Hakea lorea</i> subsp. <i>lorea</i>				
<i>Sclerolaena ?eriacantha</i>				PDP-04-06
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>				
<i>Triodia longiceps</i>				PDP-14-02



## Western Ridge Pipeline

Site PDP-019

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
761210 mE; 7401780 mN  
119.557271 E -  
23.473136 S  
**Veg Condition** Good  
**Soil** Clay Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Medium Drainage Line  
**Vegetation** \**Cenchrus setiger* tussock grassland with *Acacia citrinoviridis* and *Corymbia hamersleyana* woodland over mixed open shrubland.



## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Abutilon amplum</i>				
<i>Acacia citrinoviridis</i>				
<i>Arivela viscosa</i>				
* <i>Bidens bipinnata</i>				
<i>Boerhavia coccinea</i>				WRC307-07
* <i>Cenchrus setiger</i>				
<i>Corchorus tridens</i>				
<i>Corymbia candida</i>				
<i>Corymbia hamersleyana</i>				
<i>Duperreya commixta</i>				
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>				
* <i>Malvastrum americanum</i>				
<i>Senna artemisioides</i> subsp. <i>filifolia</i>				
<i>Solanum cleistogamum</i>				PDP-op10
<i>Tephrosia rosea</i> var. <i>Fortescue creeks</i> (M.I.H. Brooker 2186)				WRC308-03
<i>Triodia longiceps</i>				
* <i>Vachellia farnesiana</i>				

## Western Ridge Pipeline

Site PDP-020

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
761901 mE; 7401812 mN  
119.564026 E -  
23.472729 S  
**Veg Condition** Very Good  
**Soil** Sand  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain  
**Vegetation** *Triodia longiceps* closed hummock grassland with *Acacia sclerosperma* subsp. *sclerosperma*, *Acacia synchronicia* and *Acacia tetragonophylla* open shrubland.



## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>				
<i>Acacia sibirica</i>				
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Enneapogon polyphyllus</i>				WRC308-09
<i>Eremophila lachnocalyx</i>				
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>				
<i>Solanum cleistogamum</i>				PDP-op10
<i>Solanum lasiophyllum</i>				
<i>Triodia longiceps</i>				PDP-14-02



**Western Ridge Pipeline**

**Site PDP-021**

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 761387 mE; 7401814 mN  
 119.558991 E -  
 23.472799 S  
**Veg Condition** Excellent  
**Soil** Sandy Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain  
**Vegetation** *Acacia synchronicia* low open woodland over *Acacia tetragonophylla* and *Acacia aptaneura* tall open shrubland over *Eremophila lachnocalyx* and *Eremophila cuneifolia* open shrubland.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				PDP01-02
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Enteropogon ramosus</i>				WRC304-05
<i>Eragrostis eriopoda</i>				
<i>Eremophila cuneifolia</i>				PDP-02-01
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>				
<i>Eremophila lachnocalyx</i>				PDP21-01
<i>Gomphrena canescens</i>				WRC308-02
<i>Goodenia microptera</i>				WRC307-08
<i>Maireana tomentosa</i>				
<i>Maireana villosa</i>				
<i>Sclerolaena cornishiana</i>				PDP17-02
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>				

**Western Ridge Pipeline**

**Site PDP-022**

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 762530 mE; 7401967 mN  
 119.570148 E -  
 23.471232 S  
**Veg Condition** Very Good  
**Soil** Clayey Sand  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain  
**Vegetation** *Triodia wiseana* hummock grassland with *Acacia sibirica* and *Acacia synchronicia* tall scattered shrubs over *Eremophila cuneifolia* and *Eremophila fraseri* subsp. *fraseri* low scattered shrubs.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				PDP-14-01
<i>Acacia pruinocarpa</i>				
<i>Acacia sibirica</i>				
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Eremophila cuneifolia</i>				PDP-02-01
<i>Eremophila fraseri</i> subsp. <i>fraseri</i>				PFOM-04-01
<i>Maireana tomentosa</i>				
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>				PDP-02-02
<i>Triodia wiseana</i>				PDP-22-01



## Western Ridge Pipeline

Site PDP-023

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
761776 mE; 7401757 mN  
119.562808 E -  
23.473254 S  
**Veg Condition** Excellent  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain  
**Vegetation** *Acacia synchronicia*, *Hakea preissii* and *Acacia tetragonophylla* open shrubland over mixed *Senna* sp. low open shrubland over *Triodia longiceps* scattered hummock grassland.



## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Adriana tomentosa</i>				
<i>Amphipogon sericeus</i>				
<i>Enteropogon ramosus</i>				WRC304-05
<i>Eremophila lachnocalyx</i>				PDP21-01
<i>Hakea preissii</i>				
<i>Maireana</i> sp. indet				PDP03-01
<i>Ptilotus obovatus</i> var. <i>obovatus</i>				
<i>Senna artemisioides</i> subsp. <i>filifolia</i>				
<i>Senna artemisioides</i> subsp. <i>helmsii</i>				
<i>Senna</i> sp. Meekatharra (E. Bailey 1-26)				PDP17-01
<i>Sida fibulifera</i>				
<i>Triodia longiceps</i>				

**Western Ridge Pipeline**

**Site PDP-024**

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 762654 mE; 7401844 mN  
 119.571384 E -  
 23.472320 S  
**Veg Condition** Very Good  
**Soil** Clayey Sand  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain  
**Vegetation** *Acacia synchronicia* and *Acacia sibirica* scattered shrubs over *Aristida contorta* and *Enneapogon polyphyllus* scattered tussock grasses.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia coriacea</i> subsp. <i>pendens</i>				
<i>Acacia sibirica</i>				
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Aristida contorta</i>				
<i>Enneapogon polyphyllus</i>				
<i>Goodenia muelleriana</i>				WRC308-09
<i>Senna artemisioides</i> subsp. <i>helmsii</i>				PDP-04-05
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>				
<i>Tribulus suberosus</i>				



**Western Ridge Pipeline**

**Site PDP-025**

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 762080 mE; 7401716 mN  
 119.565785 E -  
 23.473575 S  
**Veg Condition** Excellent  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Triodia wiseana* hummock grassland with *Acacia synchronicia* and *Acacia tetragonophylla* tall open shrubland over mixed low open shrubland.

**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia ancistrocarpa</i>				PDP13-01
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Enneapogon caerulescens</i>				
<i>Eremophila cuneifolia</i>				PDP-02-01
<i>Senna artemisioides</i> subsp. <i>helmsii</i>				
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>				
<i>Triodia angusta</i>				PDP-06-02
<i>Triodia wiseana</i>				

**Western Ridge Pipeline**

**Site PDP-026**

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 763610 mE; 7401950 mN  
 119.580720 E -  
 23.471216 S  
**Veg Condition** Very Good  
**Soil** Clayey Sand  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Sandy/ Stony Plain  
**Vegetation** *Acacia macraneura* and *Hakea preissii* tall open shrubland over *Acacia synchronicia* and *Acacia tetragonophylla* open shrubland over *Amphipogon sericeus* scattered tussock grasses.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia macraneura</i>				PDP-18-01
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Amphipogon sericeus</i>				
<i>Hakea preissii</i>				
<i>Portulaca pilosa</i>				WRC307-05
<i>Sclerolaena ?eriacantha</i>				PDP-04-06
<i>Senna</i> sp. Meekatharra (E. Bailey 1-26)				PDP11-01



## Western Ridge Pipeline

Site PDP-027

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 763111 mE; 7401752 mN  
 119.575870 E -  
 23.473083 S  
**Veg Condition** Excellent  
**Soil** Sandy Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills  
**Vegetation** *Triodia wiseana* and *Triodia pungens* open hummock grassland with *Acacia aptaneura*, *Acacia synchronicia* and *Acacia tetragonophylla* tall shrubland over *Eremophila cuneifolia* low open shrubland.



## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				PDP01-02
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Amphipogon sericeus</i>				
<i>Enneapogon caerulescens</i>				
<i>Eremophila cuneifolia</i>				PDP-02-01
<i>Eremophila latrobei</i> subsp. <i>filiformis</i>				
<i>Scaevola spinescens</i>				
<i>Sclerolaena cornishiana</i>				PDP17-02
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>				
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>				
<i>Triodia pungens</i>				
<i>Triodia wiseana</i>				

## Western Ridge Pipeline

Site PDP-028

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
760556 mE; 7401626 mN  
119.550898 E -  
23.474626 S  
**Veg Condition** Very Good  
**Soil** Clayey Sand  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain  
**Vegetation** *Acacia macraneura* tall open shrubland over *Eremophila fraseri* subsp. *fraseri* open shrubland over *Triodia pungens* and *Triodia wiseana* scattered hummock grasses.



## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Amphipogon sericeus</i>				
<i>Eragrostis eriopoda</i>				
<i>Hibiscus coatesii</i>				
<i>Psyrax rigidula</i>				
<i>Senna</i> sp. Meekatharra (E. Bailey 1-26)				PDP17-01
<i>Solanum cleistogamum</i>				PDP-op10
<i>Tribulus suberosus</i>				
<i>Triodia pungens</i>				WRC308-07



## Western Ridge Pipeline

Site PDP-029

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
763708 mE; 7401849 mN  
119.581694 E -  
23.472106 S  
**Veg Condition** Excellent  
**Soil** Sandy Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain  
**Vegetation** *Triodia wiseana* hummock grassland with *Acacia aptaneura*, *Acacia synchronicia* and *Acacia pruinocarpa* tall open shrubland over *Eremophila cuneifolia* and *Senna glutinosa* subsp. *x luerssenii* scattered shrubs.



## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				PDP01-02
<i>Acacia pruinocarpa</i>				
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Enneapogon caerulescens</i>				
<i>Eremophila cuneifolia</i>				PDP-02-01
<i>Maireana</i> sp. indet				PDP03-01
<i>Scaevola spinescens</i>				
<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>				
<i>Solanum cleistogamum</i>				WRC304-14
<i>Triodia angusta</i>				PDP-06-02
<i>Triodia wiseana</i>				

**Western Ridge Pipeline**

**Site PDP-030**

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 759462 mE; 7401873 mN  
 119.540150 E -  
 23.472570 S  
**Veg Condition** Good  
**Soil** Clayey Sand  
**Rock Type** None Discernible  
**Fire Age** Old (6+ yr)  
**Habitat** Medium Drainage Line  
**Vegetation** \**Cenchrus ciliaris* and \**Cenchrus setiger* tussock grassland with *Acacia citrinoviridis*, *Acacia macraneura* and *Corymbia candida* open woodland.



**SPECIES LIST**

<b>Name</b>	<b>Cover</b>	<b>C Class</b>	<b>Height</b>	<b>Specimen Notes</b>
<i>Acacia macraneura</i>				PDP-18-01
<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>				
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Amyema fitzgeraldii</i>				
* <i>Cenchrus ciliaris</i>				
* <i>Cenchrus setiger</i>				
<i>Corymbia candida</i>				
<i>Eucalyptus xerothermica</i>				
* <i>Malvastrum americanum</i>				
<i>Ptilotus obovatus</i> var. <i>obovatus</i>				



**Western Ridge Pipeline**

**Site PDP-031**

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 760439 mE; 7401686 mN  
 119.549746 E -  
 23.474105 S  
**Veg Condition** Excellent  
**Soil** Sandy Clay Loam  
**Rock Type** Quartz  
**Fire Age** Moderate (3 to 5 yr)  
**Habitat** Sandy/ Stony Plain  
**Vegetation** *Acacia aptaneura*, *Hakea lorea* subsp. *lorea* and *Acacia tetragonophylla* tall open shrubland over *Eremophila fraseri* subsp. *fraseri*, *Senna glutinosa* subsp. *xluerssenii* and *Ptilotus obovatus* var. *obovatus* open shrubland.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				PDP-14-01
<i>Acacia tetragonophylla</i>				
<i>Eragrostis eriopoda</i>				
<i>Eremophila fraseri</i> subsp. <i>fraseri</i>				
<i>Hakea lorea</i> subsp. <i>lorea</i>				
<i>Ptilotus calostachyus</i>				
<i>Ptilotus obovatus</i> var. <i>obovatus</i>				
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>				PDP-02-02
<i>Senna glutinosa</i> subsp. <i>x luerssenii</i>				
<i>Senna</i> sp. Meekatharra (E. Bailey 1-26)				PDP17-01
<i>Tribulus suberosus</i>				
<i>Triodia wiseana</i>				

**Western Ridge Pipeline**

**Site PDP-032**

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 759591 mE; 7401926 mN  
 119.541401 E -  
 23.472076 S  
**Veg Condition** Very Good  
**Soil** Clayey Sand  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Undulating Low Hills  
**Vegetation** *Triodia wiseana* hummock grassland with *Acacia synchronicia* and *Melaleuca eleuterostachya* open shrubland.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia synchronicia</i>				
<i>Indigofera monophylla</i>				
<i>Melaleuca eleuterostachya</i>				PDP-op05
<i>Ptilotus clementii</i>				
<i>Triodia wiseana</i>				PDP-32-01



## Western Ridge Pipeline

Site PDP-033

**Date** 13/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
759043 mE; 7401641 mN  
119.536093 E -  
23.474736 S  
**Veg Condition** Very Good  
**Soil** Clay Loam  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Minor Drainage Line  
**Vegetation** *Acacia aptaneura* and *Acacia pruinocarpa* low woodland with *Triodia pungens* open hummock grassland and *Corymbia candida* scattered trees over *Eremophila forrestii* and *Senna glutinosa* subsp. *pruinosa* open shrubland.



## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Abutilon amplum</i>				
<i>Acacia aptaneura</i>				PDP-06-01
<i>Acacia pruinocarpa</i>				
<i>Amphipogon sericeus</i>				
<i>Chrysopogon fallax</i>				
<i>Corymbia candida</i>				
<i>Eremophila forrestii</i> subsp. <i>forrestii</i>				
<i>Eremophila latrobei</i> subsp. <i>filiformis</i>				
<i>Hibiscus coatesii</i>				
<i>Senna artemisioides</i> subsp. <i>helmsii</i>				
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>				PDP-02-02
<i>Triodia pungens</i>				WRC308-07

## Western Ridge Pipeline

Site PDP-034

**Date** 14/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
755706 mE; 7402110 mN  
119.503362 E -  
23.471032 S  
**Veg Condition** Very Good  
**Soil** Sand  
**Rock Type** Quartz  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** Chenopod low open shrubland with *Acacia synchronicia* and *Acacia tetragonophylla* scattered shrubs over *Senna* sp. Meekatharra (E. Bailey 1-26) and *Eremophila cuneifolia* low scattered shrubs.

## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Cynodon prostratus</i>				PDP-04-03
<i>Enneapogon polyphyllus</i>				WRC308-09
<i>Enteropogon ramosus</i>				PDP-34-01
<i>Eremophila cuneifolia</i>				PDP-02-01
<i>Frankenia</i> sp. indet				PDP-04-01
<i>Hakea leucoptera</i> subsp. <i>sericipes</i>				PDP03-02
<i>Oxychloris scariosa</i>				PDP-04-07
<i>Portulaca pilosa</i>				
<i>Sclerolaena ?eriacantha</i>				PDP-04-06
<i>Sclerolaena cuneata</i>				PDP-04-02
<i>Senna</i> sp. Meekatharra (E. Bailey 1-26)				PDP17-01
<i>Sporobolus actinocladus</i>				PDP-08-01
<i>Tecticornia</i> sp. indet				



## Western Ridge Pipeline

Site PDP-035

**Date** 14/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
755517 mE; 7402221 mN  
119.501502 E -  
23.470058 S  
**Veg Condition** Very Good  
**Soil** Sandy Loam  
**Rock Type** Quartz  
**Fire Age** Moderate (3 to 5 yr)  
**Habitat** Minor Drainage Line  
**Vegetation** *Acacia aptaneura* and *Acacia pruinocarpa* low open woodland with *Triodia pungens*, *Triodia angusta* and *Themeda triandra* open hummock and tussock grassland with *Eucalyptus xerothermica* scattered trees over mixed low open shrubland.



## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				PDP-06-01
<i>Acacia pruinocarpa</i>				
<i>Androcalva loxophylla</i>				PDP35-01
<i>Chrysopogon fallax</i>				
<i>Corchorus tridens</i>				
<i>Enneapogon caeruleus</i>				
<i>Eucalyptus xerothermica</i>				
<i>Hibiscus coatesii</i>				
<i>Indigofera monophylla</i>				
<i>Paraneurachne muelleri</i>				WRC307-10
<i>Ptilotus obovatus</i> var. <i>obovatus</i>				
<i>Sporobolus australasicus</i>				
<i>Themeda triandra</i>				
<i>Triodia angusta</i>				WRC-301-04
<i>Triodia pungens</i>				WRC308-07

**Western Ridge Pipeline**

**Site PDP-036**

**Date** 14/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 756143 mE; 7402058 mN  
 119.507653 E -  
 23.471433 S  
**Veg Condition** Very Good  
**Soil** Clayey Sand  
**Rock Type** None Discernible  
**Fire Age** Old (6+ yr)  
**Habitat** Drainage Area/ Floodplain  
**Vegetation** *Triodia longiceps* hummock grassland with *Acacia aptaneura* and *Hakea leuoptera* subsp. *sericipes* tall open shrubland over *Acacia synchronicia*, *Acacia tetragonophylla* and *Eremophila cuneifolia* open shrubland.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				PDP-36-01
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Eremophila cuneifolia</i>				PDP-02-01
<i>Hakea leuoptera</i> subsp. <i>sericipes</i>				PDP03-02
<i>Lepidium platypetalum</i>				PDP-36-03
<i>Ptilotus obovatus</i> var. <i>obovatus</i>				
<i>Scaevola spinescens</i>				
<i>Senna hamersleyensis</i>				PDP-36-02
<i>Triodia longiceps</i>				PDP-14-02



**Western Ridge Pipeline**

**Site PDP-037**

**Date** 14/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 756322 mE; 7402131 mN  
 119.509388 E -  
 23.470739 S  
**Veg Condition** Excellent  
**Soil** Sandy Clay Loam  
**Rock Type** Dolerite  
**Fire Age** Moderate (3 to 5 yr)  
**Habitat** Hillcrest/ Upper Hillslope  
**Vegetation** *Triodia wiseana* open hummock grassland with *Acacia synchronicia* and *Acacia aptaneura* tall open shrubland over *Acacia tetragonophylla* and *Senna glutinosa* subsp. *pruinosa* open shrubland.



**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia aptaneura</i>				PDP01-02
<i>Acacia synchronicia</i>				
<i>Acacia tetragonophylla</i>				
<i>Enneapogon caerulescens</i>				
<i>Eremophila cuneifolia</i>				PDP-02-01
<i>Hibiscus coatesii</i>				
<i>Indigofera monophylla</i>				
<i>Maireana</i> sp. indet				PDP03-01
<i>Ptilotus obovatus</i> var. <i>obovatus</i>				
<i>Senna glutinosa</i> subsp. <i>pruinosa</i>				
<i>Sida</i> ?sp. spiciform panicles (E. Leyland s.n. 14/8/90)				PDP37-01
<i>Solanum</i> ? <i>lasiophyllum</i>				WRC304-13
<i>Tribulus suberosus</i>				
<i>Triodia wiseana</i>				PDP37-02

**Western Ridge Pipeline**

**Site PDP-038**

**Date** 14/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
 754898 mE; 7402042 mN  
 119.495469 E -  
 23.471768 S  
**Veg Condition** Very Good  
**Soil** Clayey Sand  
**Rock Type** BIF  
**Fire Age** Old (6+ yr)  
**Habitat** Stony Plain



**Vegetation** *Acacia synchronicia* and *Hakea preissii* open shrubland over *Eremophila cuneifolia* and *Senna artemisioides* subsp. *oligophylla* low open shrubland over chenopod low open shrubland and mixed scattered tussock grasses.

**SPECIES LIST**

Name	Cover	C Class	Height	Specimen Notes
<i>Acacia synchronicia</i>				
<i>Chenopodiaceae</i> sp. indet				PDP-04-04
<i>Enteropogon ramosus</i>				PDP-34-01
<i>Eragrostis xerophila</i>				PDP-38-01
<i>Frankenia</i> sp. indet				PDP-04-01
<i>Hakea preissii</i>				
<i>Ptilotus exaltatus</i>				
<i>Sclerolaena cuneata</i>				PDP-04-02
<i>Senna artemisioides</i> subsp. <i>oligophylla</i>				
<i>Senna</i> sp. Meekatharra (E. Bailey 1-26)				PDP11-01
<i>Sporobolus australasicus</i>				



## Western Ridge Pipeline

Site PDP-039

**Date** 14/03/2022  
**Described by** CJW, EM  
**Type** R  
**Location** MGA Zone 50  
755116 mE; 7402171 mN  
119.497587 E -  
23.470573 S  
**Veg Condition** Good  
**Soil** Sandy Loam  
**Rock Type** Dolerite  
**Fire Age** Old (6+ yr)  
**Habitat** Major Drainage Line  
**Vegetation** \**Cenchrus setiger* and \**Cenchrus ciliaris* tussock grassland with *Acacia citrinoviridis* and *Eucalyptus victrix* open woodland over mixed scattered shrubs.



## SPECIES LIST

Name	Cover	C Class	Height	Specimen Notes
<i>Abutilon amplum</i>				
<i>Acacia citrinoviridis</i>				
<i>Acacia pyrifolia</i>				
<i>Arivela viscosa</i>				
* <i>Cenchrus ciliaris</i>				
* <i>Cenchrus setiger</i>				
<i>Chrysopogon fallax</i>				
<i>Corchorus tridens</i>				
<i>Dicladanthera forrestii</i>				
<i>Duperreya commixta</i>				WRC304-09
<i>Eucalyptus victrix</i>				
<i>Ptilotus obovatus</i> var. <i>obovatus</i>				
<i>Tephrosia rosea</i> var. <i>Fortescue creeks</i> (M.I.H. Brooker 2186)				WRC308-03
<i>Themeda triandra</i>				

## Appendix D: Vegetation Structure Definition



**NVIS Vegetation Structural Classifications**

Cover Characteristics							
Foliage cover *	70-100	30-70	10-30	<10	≈0	0-5	unknown
Crown cover **	>80	50-80	20-50	0.25-20	<0.25	0-5	unknown
% Crown cover ***	>80	50-80	20-50	0.25-20	<0.25	0-5	unknown
Cover code	d	c	i	r	bi	bc	unknown

Growth Form	Height ranges (m)	Structural Formation Classes						
tree, palm	>30 Tall	closed forest	open forest	woodland	open woodland	isolated trees	isolated clumps of trees	trees
	10-30 Mid							
	<10 Low							
tree mallee	10-30 Tall	closed mallee forest	open mallee forest	mallee woodland	open mallee woodland	isolated mallee trees	isolated clumps of mallee trees	mallee trees
	<10 Mid							
	<3 Low							
shrub, cycad, grass-tree, fern	>2 Tall	closed shrubland	shrubland	open shrubland	sparse shrubland	isolated shrubs	isolated clumps of shrubs	shrubs
	1-2 Mid							
	<1 Low							
mallee shrub	10-30 Tall	closed mallee shrubland	mallee shrubland	open mallee shrubland	sparse mallee shrubland	isolated mallee shrubs	isolated clumps of mallee shrubs	mallee shrubs
	<10 Mid							
	<3 Low							
heath shrub	>2 Tall	closed heathland	heathland	open heathland	sparse heathland	isolated heath shrubs	isolated clumps of heath shrubs	heath shrubs
	1-2 Mid							
	<1 Low							
chenopod shrub	>2 Tall	closed chenopod shrubland	chenopod shrubland	open chenopod shrubland	sparse chenopod shrubland	isolated chenopod shrubs	isolated clumps of chenopod shrubs	chenopod shrubs
	1-2 Mid							
	<1 Low							
samphire shrub	>0.5 Low	closed samphire shrubland	samphire shrubland	open samphire shrubland	sparse samphire shrubland	isolated samphire shrubs		samphire shrubs

Growth Form	Height ranges (m)	Structural Formation Classes						
	<0.5 Low						isolated clumps of samphire shrubs	
hummock grass	>2 Tall	closed hummock grassland	hummock grassland	open hummock grassland	sparse hummock grassland	isolated hummock grasses	isolated clumps of hummock grasses	hummock grasses
	<2 Tall							
tussock grass	>0.5 Mid	closed tussock grassland	tussock grassland	open tussock grassland	sparse tussock grassland	isolated tussock grasses	isolated clumps of tussock grasses	tussock grasses
	<0.5 Low							
other grass	>0.5 Mid	closed grassland	grassland	open grassland	sparse grassland	isolated grasses	isolated clumps of grasses	other grasses
	<0.5 Low							
sedge	>0.5 Mid	closed sedgeland	sedgeland	open sedgeland	sparse sedgeland	isolated sedges	isolated clumps of sedges	sedges
	<0.5 Low							
rush	>0.5 Mid	closed rushland	rushland	open rushland	sparse rushland	isolated rushes	isolated clumps of rushes	rushes
	<0.5 Low							
forb	>0.5 Mid	closed forbland	forbland	open forbland	sparse forbland	isolated forbs	isolated clumps of forbs	forbs
	<0.5 Low							
fern	>2 Tall	closed fernland	fernland	open fernland	sparse fernland	isolated ferns	isolated clumps of ferns	ferns
	1-2 Tall							
	<1 Low							
bryophyte	<0.5	closed bryophyte land	bryophyte land	open bryophyte land	sparse bryophyte land	isolated bryophytes	isolated clumps of bryophytes	bryophytes
lichen	<0.5	closed lichenland	lichenland	open lichenland	sparse lichenland	isolated lichens	isolated clumps of lichens	lichens
vine	>30 Tall	closed vineland	vineland	open vineland	sparse vineland	isolated vines	isolated clumps of vines	vines
	10-30 Med							
	<10 Low							
aquatic	<1 Tall	closed aquatic bed	aquatic bed	open aquatic bed	sparse aquatics	isolated aquatics	isolated clumps of aquatics	aquatics
	0-0.5 Low							
seagrass	<1 Tall	closed seagrass bed	Seagrass bed	open seagrass bed	sparse seagrass bed	isolated seagrasses	isolated clumps of seagrasses	seagrasses



From: NVIS Structural Formation Terminology (Australian Vegetation Attribute Manual Version 6.0 August 2003  
<http://www.environment.gov.au/erin/nvis/publications/avam/pubs/vegetation-attribute-manual-6.pdf>)

\* Foliage Cover is defined for each stratum as 'the proportion of the ground, which would be shaded if sunshine came from directly overhead'. It includes branches and leaves and is similar to the Crown type of Walker and Hopkins (1990) but is applied to a stratum or plot rather than an individual crown. It is generally not directly measured in the field for the upper stratum, although it can be measured by various line interception methods for ground layer vegetation. For the attribute COVER CODE in the Stratum table, the ground cover category refers to ground foliage cover not percentage cover.

\*\* Crown Cover (canopy cover) as per Walker and Hopkins (1990). Although relationships between the two are dependent on season, species, species age etc. (Walker & Hopkins, 1990), the crown cover category classes have been adopted as the defining measure.

\*\*\* The percentage cover is defined as the percentage of a strictly defined plot area, covered by vegetation. This can be an estimate and is a less precise measure than using, for example, a point intercept transect methods on ground layer, or overstorey vegetative cover. That is for precisely measured values (e.g., crown densitometer or point intercept transects) the value measured would be 'foliage' cover. Where less precise or qualitative measures are used these will most probably be recorded as 'percentage' cover.

## Appendix E: Vegetation Condition Definition



**Vegetation Condition Scale (adapted from Keighery (1994) and Trudgen (1988))**

Condition Scale	Description
<b>Excellent (1)</b>	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement
<b>Very Good (2)</b>	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
<b>Good (3)</b>	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
<b>Poor (4)</b>	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires, or aggressive weeds.
<b>Degraded (5)</b>	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
<b>Completely Degraded (6)</b>	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e., areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

## **Appendix F: Significant Flora Assessment of Occurrence**



Taxon	Conservation Code			Habit and Habitat	Habitat within Survey Area	Within Current Known Distribution	Distance to Nearest Record	Likelihood Pre-survey	Likelihood Post-Survey
	DBCA	BC Act	EPBC Act						
<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727)	P3			Open, erect annual or biennial, herb, to 0.2 m high. Fl. yellow. Red-brown clay soil, calcrete pebbles. Low undulating plain, swampy plains.	Yes	Yes	0.4 km SE	Highly Likely	Unlikely
<i>Swainsona thompsoniana</i>	P3			Prostrate annual herb, to 0.2m high, Fl. blue. Higher altitude floodplains, top of hilltops and cracking clays on red-brown clay.	Yes	Yes	1.5 km N	Likely	Possible
<i>Goodenia nuda</i>	P4			Erect to ascending herb, to 0.5 m high. Fl. yellow, Apr to Aug. Mulga hardpan plains, undulating plains, floodplains, minor drainage lines on red sandy-loams, clay-loams.	Yes	Yes	4.5 km NE	Likely	Possible
<i>Hibiscus campanulatus</i>	P1			Erect bushy shrub, 1-3.5 m high. Fl. White/pale pink. Brown loamy to skeletal soils. Rocky gullies, ironstone range.	Possible	Adjacent	10 km NW	Possible	Highly Unlikely
<i>Ipomoea racemigera</i>	P2			Creeping annual, herb or climber. Fl. white.	Possible	Yes	2.8 km NNW	Possible	Confirmed
<i>Isotropis parviflora</i>	P2			Shrub, 0.1 m high. Fl. white/pink, Mar. Valley slope of ironstone plateau.	Possible	Yes	7.5 km NNW <sup>5</sup>	Possible	Highly Unlikely
<i>Aristida jerichoensis</i> var. <i>subspinulifera</i>	P3			Compactly tufted perennial, grass-like or herb, 0.3-0.8 m high, lemma groove muricate. Hardpan plains.	Possible	Yes	3.3 km NW	Possible	Possible
<i>Gymnanthera cunninghamii</i>	P3			Erect shrub, 1-2 m high. Fl. cream-yellow-green, Jan to Dec. Sandy soils.	Possible	Yes	4.8 km NE	Possible	Unlikely
<i>Indigofera gilesii</i>	P3			Shrub, to 1.5 m high. Fl. purple-pink, May or Aug. Pebbly loam. Amongst boulders & outcrops, hills.	Possible	Yes	12.8 km NNW	Possible	Highly Unlikely
<i>Lepidium catapycnon</i>	P4			Open, woody perennial, herb or shrub, 0.2-0.3 m high, stems zigzag. Fl. white, Oct. Skeletal soils. Hillsides.	Yes	Adjacent	5.6 km NW	Possible	Highly Unlikely
<i>Acacia corusca</i>	P1			Shrub, 1.5-5(-7) m high. Red brown sandy loam soils. Hill slopes, hillcrests, drainage lines.	No	No	25.8 km ENE	Unlikely	Highly Unlikely
<i>Eremophila capricornica</i>	P1			Compact shrub, 0.2-0.5(-0.75) m high. Fl. blue-purple. Red brown loam soil. Hardpan plain over granite.	Possible	No	27.6 km ENE	Unlikely	Unlikely
<i>Eremophila rhexos</i>	P1			Erect shrub, ca 1 m high. Fl. blue-purple-white, Sep. Skeletal stony loam over granite.	No	No	27.6 km SE	Unlikely	Highly Unlikely
<i>Eremophila</i> sp. West Angelas (S. van Leeuwen 4068)	P1			Spindly shrub, 0.4-3 m high. Skeletal brown-red soil or loam. Hill slopes and summits.	No	No	32.9 km NW	Unlikely	Highly Unlikely
<i>Vittadinia</i> sp. Coondewanna Flats (S. van Leeuwen 4684)	P1			Erect annual herb, 0.3-1 m high. Fl. cream. Red-brown sandy loam. Drainage areas, floodplains, flat and/or stony plains.	Possible	Yes	22.6 km ESE	Unlikely	Unlikely
<i>Aristida lazardis</i>	P2			Tufted perennial, grass-like or herb, 0.4-1.5 m high. Fl. green/purple, Apr. Sand, or loam. Floodplains, drainage lines.	Possible	No	29.9 km NW	Unlikely	Possible
<i>Euphorbia inappendiculata</i> var. <i>inappendiculata</i>	P2			Prostrate annual herb, to 0.1 m high. Red brown clay loam. Flat plain, cracking clay floodplain, gentle slopes.	Possible	Yes	23.5 km E	Unlikely	Highly Unlikely
<i>Oxalis</i> sp. Pilbara (M.E. Trudgen 12725)	P2			Annual herb, 0.1-0.3 m high. Fl. Yellow. Brown sandy loam or clay. Gorge, ironstone outcrops, gully, shaded areas, creeklines.	Possible	Adjacent	41.2 km NW	Unlikely	Unlikely
<i>Acacia subtiliformis</i>	P3			Spindly, slender, erect shrub, to 3.5 m high, phyllodes green; inflorescence in heads to 6 mm diameter; peduncles red. Fl. yellow, Jun. On rocky calcrete plateau.	No	No	31 km NNW	Unlikely	Highly Unlikely
<i>Amaranthus centralis</i>	P3			Annual herb, decumbent or erect to 0.6 m high. Red clay loam or sand. Flats, plains, granite outcrops, riverbanks.	No	No	39.4 km NE	Unlikely	Highly Unlikely
<i>Crotalaria smithiana</i>	P3			Annual, herb, to 0.4 m high. Fl. yellow, Jun. Regeneration site on floodplain.	Possible	No	20.7 km NNE	Unlikely	Unlikely
<i>Eremophila magnifica</i> subsp. <i>velutina</i>	P3			Shrub, 0.5-1.5 m high. Fl. blue-purple, Aug to Sep. Skeletal soils over ironstone. Summits.	No	Yes	26.9 km SE	Unlikely	Highly Unlikely
<i>Eremophila rigida</i>	P3			Bushy shrub, 0.3-4 m high. Fl. cream, Sep. Red sand alluvium. Hardpan plains, stony clay depressions.	Possible	Yes	16.6 km S	Unlikely	Highly Unlikely
<i>Eremophila</i> sp. Hamersley Range (K. Walker KW 136)	P3			Erect shrub, 1-3 m high. Fl. White/pale blue. Red brown sandy clay loam. Upper slopes, gullies, gorges.	Possible	Yes	5 km NW	Unlikely	Highly Unlikely
<i>Maireana prosthochaeta</i>	P3			Open, densely-leaved shrub, 0.3-0.6 m high. Laterite. Hills, salty places.	No	No	21.2 km SSW	Unlikely	Highly Unlikely
<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794)	P3			Tall spindly shrub, 1.5-4 m high. Fl. yellow. Red brown sandy loam or clay, ironstone plain. Undulating plains, floodplain.	Possible	Yes	17.6 km NNE	Unlikely	Confirmed
<i>Themeda</i> sp. Hamersley Station (M.E. Trudgen 11431)	P3			Tussocky perennial, grass-like or herb, 0.9-1.8 m high. Fl. Aug. Red clay. Clay pan, grass plain.	Possible	Yes	23.7 km NNE	Unlikely	Unlikely
<i>Triodia</i> sp. Mt Ella (M.E. Trudgen 12739)	P3			Perennial, grass-like or herb, 0.4 m high. Light orange-brown, pebbly loam. Amongst rocks & outcrops, gully slopes.	No	Yes	15.3 km NNW	Unlikely	Highly Unlikely

<sup>5</sup> Nearest record recorded by ENV (2012)

Taxon	Conservation Code			Habit and Habitat	Habitat within Survey Area	Within Current Known Distribution	Distance to Nearest Record	Likelihood Pre-survey	Likelihood Post-Survey
	DBCA	BC Act	EPBC Act						
<i>Acacia bromilowiana</i>	P4			Tree or shrub, to 12 m high, bark dark grey, fibrous; inflorescence in spikes. Fl. yellow/pink, Jul to Aug. Red skeletal stony loam, orange-brown pebbly, gravel loam, laterite, banded ironstone, basalt. Rocky hills, breakaways, scree slopes, gorges, creek beds.	Possible	Yes	32.9 km NW	Unlikely	Highly Unlikely
<i>Eremophila magnifica</i> subsp. <i>magnifica</i>	P4			Shrub, 0.5-1.5 m high. Fl. blue, Aug to Nov. Skeletal soils over ironstone. Rocky screes.	No	Adjacent	5.7 km NNW	Unlikely	Highly Unlikely
<i>Eremophila youngii</i> subsp. <i>lepidota</i>	P4			Dense, spreading shrub, (0.2-)1-3 m high. Fl. purple-red-pink, Jan or Mar or Jun or Aug to Sep. Stony red sandy loam. Flats, plains, floodplains, sometimes semi-saline, clay flats.	Possible	Yes	11.8 km NNE	Unlikely	Highly Unlikely
<i>Goodenia berringbinensis</i>	P4			Ascending annual, herb, 0.1-0.3 m high. Fl. yellow, Oct. Red sandy loam. Along watercourses.	Possible	Yes	17.3 km ESE	Unlikely	Unlikely
<i>Goodenia hartiana</i>	P2			Erect to spreading, multistemmed perennial, herb, or shrub (sub-shrub). Fl. blue-purple. Sand. Sand dune swales, sandhills.	No	No	20.9 km E	Highly Unlikely	Highly Unlikely
<i>Dampiera metallorum</i>	P3			Rounded, multistemmed perennial, herb, to 0.5 m high. Fl. blue, Apr, or Jun to Oct. Skeletal red-brown gravelly soil over banded ironstone. Steep slopes, summits of hills.	No	No	45.9 km WNW	Highly Unlikely	Highly Unlikely
<i>Pityrodia augustensis</i>	T		VUL	Bushy shrub, ca 1 m high. Fl. purple/purple-red, Aug to Sep. Amongst rocks on slopes or in drainage lines.	No	No	>200 km SW	Highly Unlikely	Highly Unlikely



## **Appendix G: Key Findings from the Literature Review**

Survey Details	Methods	Results	Significant Findings	Limitations
<p>Biota (2001)</p> <p><b>Client:</b> BHP Iron Ore Pty Ltd</p> <p><b>Type:</b> Biological Survey</p> <p><b>Location:</b> Mining Lease 244SA (partially overlaps Survey Area)</p> <p><b>Timing:</b> September – October 2000</p>	<ul style="list-style-type: none"> <li>60 detailed floristic sites (quadrats)</li> <li>Targeted Searches</li> </ul>	<ul style="list-style-type: none"> <li>380 plant taxa from 98 families and 168 genera</li> <li>27 vegetation associations</li> <li>Four major landform groups</li> <li>11 introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>One Priority flora species recorded: <ul style="list-style-type: none"> <li><i>Eriachne tenuiculmis</i> (P3) – no longer a priority flora species</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Poor seasonal conditions</li> <li>Recently burnt</li> <li>Lack of aerial photography for portion of survey area</li> </ul>
<p>GHD (2011a)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Detailed Flora and Vegetation Survey</p> <p><b>Location:</b> Orebody 35 and Surrounds (partially overlaps Survey Area)</p> <p><b>Timing:</b> May and August 2010</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>88 detailed floristic sites (quadrats)</li> <li>35 relevé plots</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>347 plant taxa from 48 families and 159 genera</li> <li>22 vegetation associations</li> <li>10 broad floristic formations</li> <li>Vegetation condition ranged from 'Pristine' to 'Completely Degraded'</li> <li>13 introduced taxa</li> </ul>	<ul style="list-style-type: none"> <li>Three Priority flora taxa recorded: <ul style="list-style-type: none"> <li><i>Gymnanthera cunninghamii</i> (P3)</li> <li><i>Indigofera gilesii</i> subsp. <i>gilesii</i> (P4) (now <i>Indigofera gilesii</i> (P3))</li> <li><i>Goodenia nuda</i> (P4)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>Onshore (2014a)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Mapping Consolidation</p> <p><b>Location:</b> BHP's central, eastern, and mainline rail tenements (partially overlaps Survey Area)</p> <p><b>Timing:</b> Mapping consolidation completed in 2015. Additional field surveys completed in July and August 2013</p>	<ul style="list-style-type: none"> <li>A combination of: <ul style="list-style-type: none"> <li>Review of historical surveys</li> <li>Field surveys to fill 'gaps'</li> <li>Consolidation of vegetation mapping</li> <li>Review significant plant taxa</li> <li>Review of introduced weed taxa</li> <li>Consolidation of vegetation condition mapping</li> <li>Review and consolidation of raw and spatial data</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>15 landform types described and mapped</li> <li>218 vegetation associations</li> <li>53 broad floristic formations.</li> </ul>	<ul style="list-style-type: none"> <li>Themeda grasslands on cracking clay TEC present</li> <li>Six PECs represented in the Study Area</li> <li>57 significant plant taxa including one threatened<sup>6</sup>, 14 P1, 11 P2, 26 P3, and four P4</li> <li>56 introduced weed taxa, including seven recognised as DPs under the BAM Act</li> <li>Three introduced weed taxa that are listed as WoNS (<i>*Jatropha gossypifolia</i>, <i>*Parkinsonia aculeata</i> and <i>*Tamarix aphylla</i>).</li> </ul>	<ul style="list-style-type: none"> <li>Timing of historical field surveys</li> <li>Detail in raw data lacking</li> <li>Variability in scope and resources for previous baseline surveys</li> <li>Variability in completeness of raw data</li> <li>Vegetation mapping linework and overlapping datasets</li> <li>Mis-identification of keystone plant taxa.</li> <li>Gaps in vegetation datasets.</li> </ul>

<sup>6</sup> *Lepidium catapycnon* is no longer listed as a Threatened flora species. It is now listed as Priority 4.



Survey Details	Methods	Results	Significant Findings	Limitations
<p>Onshore (2014b)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Detailed Flora and Vegetation Survey</p> <p><b>Location:</b> Western Ridge (partially overlaps Survey Area)</p> <p><b>Timing:</b> June 2014</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>12 detailed floristic sites (quadrats)</li> <li>116 relevé plots</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>199 plant taxa from 32 families and 93 genera</li> <li>17 vegetation associations</li> <li>10 broad floristic formations</li> <li>Vegetation condition ranged from 'Excellent' to 'Good'</li> <li>Seven introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>One Priority listed flora taxon and one taxon of interest recorded: <ul style="list-style-type: none"> <li><i>Calotis latiuscula</i> – no longer a priority flora species</li> <li><i>Aristida</i> cf. <i>nitidula</i> (species of interest)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>Onshore (2016)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Desktop Assessment</p> <p><b>Location:</b> Western Ridge Southern Tenements (partially overlaps Survey Area)</p> <p><b>Timing:</b> October 2016</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> </ul>	<ul style="list-style-type: none"> <li>13 vegetation associations</li> <li>Nine broad floristic formations</li> </ul>	<ul style="list-style-type: none"> <li>Significant flora identified as likely to occur in the study area: <ul style="list-style-type: none"> <li><i>Aristida lazaridis</i> (P2)</li> <li><i>Calotis latiuscula</i> (P3) – no longer a priority flora species</li> <li><i>Eremophila magnifica</i> subsp. <i>magnifica</i> (P4)</li> <li><i>Eremophila magnifica</i> subsp. <i>velutina</i> (P3)</li> <li><i>Goodenia nuda</i> (P4)</li> <li><i>Gymnanthera cunninghamii</i> (P3)</li> <li><i>Indigofera gilesii</i> (P3)</li> <li><i>Ipomoea racemigera</i> (P2)</li> <li><i>Isotropis parviflora</i> (P2)</li> <li><i>Lepidium catapycnon</i> (P4)</li> <li><i>Triodia</i> sp. Mt Ella (M.E. Trudgen 12739) (P3)</li> </ul> </li> <li>One vegetation association closely affiliated to the West Angelas Cracking Clay PEC (P1).</li> <li>Three vegetation associations supporting Mulga Low Open Forest were representative of 'Valley Floor Mulga' within the Hamersley subregion (considered an ecosystem at risk)</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>

Survey Details	Methods	Results	Significant Findings	Limitations
<p>Biologic (2020a)</p> <p><b>Client:</b> BHP Western Australia Iron Ore</p> <p><b>Type:</b> Detailed Flora and Vegetation Survey</p> <p><b>Location:</b> Coomabanbunna Well (partially overlaps Survey Area)</p> <p><b>Timing:</b> March 2019</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>44 detailed floristic sites (quadrats)</li> <li>Six relevé plots</li> <li>Targeted searching</li> </ul>	<ul style="list-style-type: none"> <li>185 plant taxa from 34 families and 91 genera</li> <li>18 vegetation associations</li> <li>Nine broad floristic formations</li> <li>Vegetation condition ranged from 'Excellent' to 'Completely Degraded'</li> <li>Nine introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>Poor seasonal conditions</li> </ul>
<p>HGM (1999b)</p> <p><b>Client:</b> BHP Iron Ore Pty Ltd</p> <p><b>Type:</b> Biological Survey</p> <p><b>Location:</b> Orebody 30 and 35 (adjacent north)</p> <p><b>Timing:</b> August 1999</p>	<ul style="list-style-type: none"> <li>10 detailed floristic sites (quadrats)</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>206 plant taxa from 44 families and 101 genera</li> <li>Five vegetation associations</li> <li>Four introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>One priority listed flora taxon: <ul style="list-style-type: none"> <li><i>Triumfetta leptacantha</i> (P3) – no longer a priority flora species</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Poor seasonal conditions</li> </ul>
<p>ecologia (2004)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Targeted flora survey and weed survey</p> <p><b>Location:</b> Newman Hub (adjacent north)</p> <p><b>Timing:</b> June 2004</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>Linear transects</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>Five vegetation associations</li> <li>Four introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora species recorded</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>ecologia (2005)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Biological Survey</p> <p><b>Location:</b> Western Ridge (adjacent west)</p> <p><b>Timing:</b> May 2005</p>	<ul style="list-style-type: none"> <li>Seven detailed floristic sites (quadrats)</li> <li>Targeted searching</li> </ul>	<ul style="list-style-type: none"> <li>91 plant taxa from 28 families and 47 genera</li> <li>Three vegetation types</li> <li>No introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>Recently burnt in some areas</li> </ul>
<p>ecologia (2006a)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Biological Survey</p> <p><b>Location:</b> Western Ridge (adjacent north &amp; west)</p> <p><b>Timing:</b> May – June 2006</p>	<ul style="list-style-type: none"> <li>36 proposed drill pads surveyed (20m x 20m)</li> <li>1 km of track line surveyed (10m x 10m)</li> </ul>	<ul style="list-style-type: none"> <li>152 plant taxa from 35 families and 79 genera</li> <li>Five vegetation types</li> <li>Three introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>One Priority flora species recorded: <ul style="list-style-type: none"> <li><i>Calotis latiuscula</i> – no longer a priority flora species</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Poor seasonal conditions</li> </ul>



Survey Details	Methods	Results	Significant Findings	Limitations
<p>ENV (2006a)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Flora and Vegetation Assessment</p> <p><b>Location:</b> Mt Whaleback and Orebody 29 (adjacent north)</p> <p><b>Timing:</b> August 2006</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>81 detailed floristic sites (quadrats)</li> <li>Relevé plots</li> <li>Opportunistic collections</li> <li>Targeted searching</li> </ul>	<ul style="list-style-type: none"> <li>243 plant taxa from 42 families and 117 genera</li> <li>Ten broad floristic formations</li> <li>Vegetation condition ranged from 'Excellent' to 'Poor'</li> <li>Seven introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>One significant flora taxon recorded: <ul style="list-style-type: none"> <li><i>Lepidium catapycnon</i> (T) – now a P4</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>Biologic (2009)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Detailed Flora and Vegetation Survey</p> <p><b>Location:</b> Newman Power Network (adjacent north)</p> <p><b>Timing:</b> July 2009</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>All species recorded and identified from over 132 km of power lines</li> <li>Targeted searching</li> </ul>	<ul style="list-style-type: none"> <li>319 plant taxa from 54 families and 148 genera</li> <li>10 vegetation associations</li> <li>Vegetation condition ranged from 'Very Good' to 'Totally Degraded'</li> <li>14 introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>One Priority listed taxon: <ul style="list-style-type: none"> <li><i>Goodenia nuda</i> (P3) – now a P4</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>Onshore and Biologic (2009)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Detailed Flora and Vegetation Survey</p> <p><b>Location:</b> Whaleback mine site (adjacent north)</p> <p><b>Timing:</b> June 2009</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>30 detailed floristic sites (quadrats)</li> <li>Relevé plots</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>201 plant taxa from 40 families and 100 genera</li> <li>Nine vegetation associations</li> <li>Seven broad floristic formations</li> <li>Vegetation condition ranged from 'Excellent' to 'Completely Degraded'</li> <li>17 introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>Poor seasonal conditions</li> </ul>
<p>Astron (2010)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Detailed Flora and Vegetation Survey</p> <p><b>Location:</b> Mt Whaleback Tailings Storage Facility (adjacent north)</p> <p><b>Timing:</b> March 2010</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>Five detailed floristic sites (quadrats)</li> <li>Two relevé plots</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>71 plant taxa from 18 families and 38 genera</li> <li>Three vegetation associations</li> <li>One broad floristic formation</li> <li>Vegetation condition ranged from 'Excellent' to 'Completely Degraded'</li> <li>Two introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>Timing of Survey (poor seasonal conditions)</li> </ul>

Survey Details	Methods	Results	Significant Findings	Limitations
<p>ENV (2010)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Detailed Flora and Vegetation Survey</p> <p><b>Location:</b> Orebody 35 (adjacent west)</p> <p><b>Timing:</b> December 2009</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>28 detailed floristic sites (quadrats)</li> <li>One relevé plot</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>189 plant taxa from 37 families and 86 genera</li> <li>10 vegetation associations</li> <li>Vegetation condition ranged from 'Excellent' to 'Completely Degraded'</li> <li>Three introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>One Priority listed taxon: <ul style="list-style-type: none"> <li><i>Tephrosia</i> sp. Pilbara Ranges (S. van Leeuwen 4246) – now known as <i>Tephrosia oxalidea</i> which is not a priority taxon</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Timing of survey</li> </ul>
<p>ENV (2011a)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Detailed Flora and Vegetation Survey</p> <p><b>Location:</b> Whaleback East (adjacent north)</p> <p><b>Timing:</b> January 2011</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>15 detailed floristic sites (quadrats)</li> <li>Three relevé plots</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>127 plant taxa from 31 families and 64 genera</li> <li>Eight vegetation associations</li> <li>Vegetation condition ranged from 'Pristine' to 'Completely Degraded'</li> <li>Seven introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>Timing of survey</li> </ul>
<p>ENV (2012)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Detailed Flora and Vegetation Survey</p> <p><b>Location:</b> Eastern Ridge (adjacent north)</p> <p><b>Timing:</b> April &amp; July 2011</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>51 detailed floristic sites (quadrats)</li> <li>One mapping note</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>422 plant taxa from 52 families and 167 genera</li> <li>13 vegetation associations</li> <li>Ten broad floristic formations</li> <li>Vegetation condition ranged from 'Pristine' to 'Completely Degraded'</li> <li>19 introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>Five Priority listed flora taxa recorded: <ul style="list-style-type: none"> <li><i>Aristida jerichoensis</i> var. <i>subspinulifera</i> (P1) – now a P3</li> <li><i>Calotis latiuscula</i> (P3) – no longer a priority flora species</li> <li><i>Goodenia nuda</i> (P4)</li> <li><i>Eremophila magnifica</i> var. <i>velutina</i> (P3)</li> <li><i>Isotropis parviflora</i> (P2)</li> </ul> </li> <li>One WoNS and DP recorded: <ul style="list-style-type: none"> <li>*<i>Tamarix aphylla</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>Onshore (2013)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Desktop Assessment</p> <p><b>Location:</b> Mt Whaleback (8.6 km north)</p> <p><b>Timing:</b> April 2013</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>Consolidation of 40 flora and vegetation reports completed at Mt Whaleback</li> </ul>	<ul style="list-style-type: none"> <li>352 plant taxa from 48 families and 147 genera</li> <li>20 vegetation associations</li> <li>Six broad floristic formations</li> <li>Vegetation condition ranged from 'Pristine' to 'Completely Degraded'</li> <li>19 introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>Three Priority listed flora taxa recorded: <ul style="list-style-type: none"> <li><i>Calotis latiuscula</i> – no longer a priority flora species</li> <li><i>Eremophila magnifica</i> subsp. <i>magnifica</i> (P4)</li> <li><i>Lepidium catapycnon</i> (T) – now a P4</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>



Survey Details	Methods	Results	Significant Findings	Limitations
<p>Onshore (2018)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Desktop Assessment</p> <p><b>Location:</b> Western Ridge Exploration Tenement (adjacent north)</p> <p><b>Timing:</b> November 2018</p>	<ul style="list-style-type: none"> <li>Desktop Assessment</li> </ul>	<ul style="list-style-type: none"> <li>13 vegetation associations</li> <li>Six broad floristic formations</li> </ul>	<ul style="list-style-type: none"> <li>One Threatened and 37 Priority flora taxa identified as potentially occurring within the vicinity of the study area.</li> <li>Significant flora identified as likely to occur in the study area: <ul style="list-style-type: none"> <li><i>Calotis latiuscula</i> (P3) – no longer a priority flora species</li> <li><i>Eremophila magnifica</i> subsp. <i>magnifica</i> (P4)</li> <li><i>Goodenia nuda</i> (P4)</li> <li><i>Ipomoea racemigera</i> (P2)</li> </ul> </li> <li>Two vegetation associations supporting Mulga Low Open Forest were representative of 'Valley Floor Mulga' within the Hamersley subregion (considered an 'ecosystem at risk')</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>Biologic (2020b)</p> <p><b>Client:</b> BHP Western Australia Iron Ore</p> <p><b>Type:</b> Detailed Flora and Vegetation Survey</p> <p><b>Location:</b> Western Ridge exploration tenement (adjacent south)</p> <p><b>Timing:</b> March 2019</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>34 detailed floristic sites (quadrats)</li> <li>Five relevé plots</li> <li>Additional 45 quadrats and five relevés sampled in Coombanbunna Well</li> <li>Targeted searching</li> </ul>	<ul style="list-style-type: none"> <li>152 plant taxa from 29 families and 70 genera</li> <li>16 vegetation associations</li> <li>Seven broad floristic formations</li> <li>Vegetation condition ranged from 'Excellent' to 'Degraded'</li> <li>Three introduced flora species</li> <li>Additional 66 native taxa and six introduced species from Coombanbunna Well</li> <li>Total of 209 native flora taxa and nine introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>Poor seasonal conditions</li> <li>Proportion of flora recorded and/or collected</li> </ul>
<p>ENV (2006c)</p> <p><b>Client:</b> Mine and Port Developments Joint Venture</p> <p><b>Type:</b> Flora and Vegetation Assessment</p> <p><b>Location:</b> RGP4 Newman hub infrastructure area (1 km north)</p> <p><b>Timing:</b> September 2006</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>Ten detailed floristic sites (quadrats)</li> <li>Relevé plots</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>168 plant taxa from 39 families and 99 genera</li> <li>11 vegetation associations</li> <li>Seven broad floristic formations</li> <li>Eight introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>

Survey Details	Methods	Results	Significant Findings	Limitations
<p>Eco Logical (2012)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Reconnaissance Flora and Vegetation Survey</p> <p><b>Location:</b> Great Northern Highway (1.3 km west)</p> <p><b>Timing:</b> August 2011</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>Three detailed floristic sites (quadrats)</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>52 plant taxa from 14 families and 26 genera</li> <li>Seven vegetation associations</li> <li>Vegetation condition ranged from 'Pristine' to 'Completely Degraded'</li> <li>One introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>ENV (2006d)</p> <p><b>Client:</b> Mine and Port Developments Joint Venture</p> <p><b>Type:</b> Flora and Vegetation Assessment</p> <p><b>Location:</b> RGP4 Newman hub stockpile and borrow areas for construction (1.5 km northwest)</p> <p><b>Timing:</b> October 2006</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>41 detailed floristic sites (quadrats)</li> <li>Four relevé plots</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>285 plant taxa from 47 families and 115 genera</li> <li>Seven broad floristic formations</li> <li>13 introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>One Priority listed flora species recorded: <ul style="list-style-type: none"> <li><i>Acacia kenneallyi</i> (P3)<sup>7</sup></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>ENV (2009a)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Reconnaissance Flora and Vegetation Survey</p> <p><b>Location:</b> Homestead Creek Culvert (1.5 km northeast)</p> <p><b>Timing:</b> July 2009</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>Four detailed floristic sites (quadrats)</li> <li>One relevé plot</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>80 plant taxa from 24 families and 53 genera</li> <li>Three vegetation associations</li> <li>Vegetation condition ranged from 'Excellent' to 'Completely Degraded'</li> <li>Six introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>Eco Logical (2011)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Reconnaissance Flora and Vegetation</p> <p><b>Location:</b> Newman power line corridor (1.9 km north)</p> <p><b>Timing:</b> August 2011</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>Relevé plots</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>33 plant taxa from 6 families and 15 genera</li> <li>14 vegetation associations</li> <li>Vegetation condition ranged from 'Excellent' to 'Completely Degraded'</li> <li>Three introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>

<sup>7</sup> *Acacia kenneallyi* is restricted to the northern Kimberley region of Western Australia and the Whaleback record was a misidentification.

Survey Details	Methods	Results	Significant Findings	Limitations
<p>ENV (1999b)</p> <p><b>Client:</b> BHP Iron Ore Pty Ltd</p> <p><b>Type:</b> Targeted Flora Survey</p> <p><b>Location:</b> Greater Newman Area (2.8 km north)</p> <p><b>Timing:</b> September &amp; November 1999</p>	<ul style="list-style-type: none"> <li>Targeted searching</li> </ul>	<ul style="list-style-type: none"> <li>No introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>One significant flora taxon recorded: <ul style="list-style-type: none"> <li><i>Lepidium catapycnon</i> (T) – now a P4</li> </ul> </li> <li>Eight new populations identified</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>Astron (2014)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Reconnaissance Flora and Vegetation Survey</p> <p><b>Location:</b> Coolibah Village (4.3 km southeast)</p> <p><b>Timing:</b> May 2014</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>Eight relevé plots</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>54 plant taxa from 21 families and 35 genera</li> <li>Three vegetation associations</li> <li>Three broad floristic formations</li> <li>Vegetation condition ranged from 'Excellent' to 'Completely Degraded'</li> <li>Two introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>ENV (2009c)</p> <p><b>Client:</b> WorleyParsons Services</p> <p><b>Type:</b> Detailed Flora and Vegetation Survey</p> <p><b>Location:</b> Whaleback Power Station (4.4 km north)</p> <p><b>Timing:</b> April 2009</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>Seven detailed floristic sites (quadrats)</li> <li>Three relevé plots</li> <li>Opportunistic collections</li> <li>Targeted searching</li> </ul>	<ul style="list-style-type: none"> <li>124 plant taxa from 28 families and 65 genera</li> <li>Seven vegetation associations</li> <li>Vegetation condition ranged from 'Excellent' to 'Completely Degraded'</li> <li>Five introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>ENV (1999a)</p> <p><b>Client:</b> BHP Iron Ore Pty Ltd</p> <p><b>Type:</b> Targeted Flora Survey</p> <p><b>Location:</b> Mt Whaleback and surrounds (5 km north)</p> <p><b>Timing:</b> June – August 1999</p>	<ul style="list-style-type: none"> <li>Targeted searching</li> <li>Ten foot traverses</li> </ul>	<ul style="list-style-type: none"> <li>No introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>One significant flora taxon recorded: <ul style="list-style-type: none"> <li><i>Lepidium catapycnon</i> (T) – now a P4</li> <li>36 sub-populations of <i>Lepidium catapycnon</i> identified during the survey</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>Onshore (2015)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Reconnaissance Flora and Vegetation Survey</p> <p><b>Location:</b> Kurra Village (5.1 km north)</p> <p><b>Timing:</b> December 2014</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>35 relevé plots</li> <li>Targeted searching</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>125 plant taxa from 25 families and 73 genera</li> <li>14 vegetation associations</li> <li>10 broad floristic formations</li> <li>Vegetation condition ranged from 'Good' to 'Degraded'</li> <li>15 introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>



Survey Details	Methods	Results	Significant Findings	Limitations
<p>GHD (2008a)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Detailed Flora and Vegetation Survey</p> <p><b>Location:</b> Myopic Project Area (5.2 km northwest)</p> <p><b>Timing:</b> May – June 2008</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>119 detailed floristic sites (quadrats)</li> <li>22 relevé plots</li> <li>Targeted searching</li> </ul>	<ul style="list-style-type: none"> <li>321 plant taxa from 52 families</li> <li>Nine vegetation types</li> <li>Four major landscape types</li> <li>Vegetation condition ranged from 'Pristine' to 'Good'</li> <li>14 introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>Two priority listed flora taxa: <ul style="list-style-type: none"> <li><i>Brunonia</i> sp. Long hairs (D.E. Symon 2440) – no longer a priority flora species</li> <li><i>Triumfetta leptacantha</i> – no longer a priority flora species</li> </ul> </li> <li>Four range extensions: <ul style="list-style-type: none"> <li><i>Fimbristylis leucocolea</i> (250 km south)</li> <li><i>Acacia cuthbertsonii</i> subsp. <i>cuthbertsonii</i> (50 km north)</li> <li><i>Acrachne racemose</i> (100 km east)</li> <li>*<i>Pennisetum setaceum</i> (400 km south)</li> </ul> </li> <li>One WoNS and DP recorded: <ul style="list-style-type: none"> <li>*<i>Tamarix aphylla</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Poor seasonal conditions</li> </ul>
<p>ENV (2006b)</p> <p><b>Client:</b> Mine and Port Developments Joint Venture</p> <p><b>Type:</b> Flora and Vegetation Assessment</p> <p><b>Location:</b> Kurra Village (5.5 km north)</p> <p><b>Timing:</b> September 2006</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>Nine detailed floristic sites (quadrats)</li> <li>Relevé plots</li> <li>Opportunistic collections</li> </ul>	<ul style="list-style-type: none"> <li>117 plant taxa from 25 families and 59 genera</li> <li>Nine vegetation associations</li> <li>Two broad floristic formations</li> <li>Seven introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora or ecological communities recorded</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>

Survey Details	Methods	Results	Significant Findings	Limitations
<p>ENV (2009b)</p> <p><b>Client:</b> WorleyParsons Services</p> <p><b>Type:</b> Detailed Flora and Vegetation Survey</p> <p><b>Location:</b> Newman to Yandi Transmission Line (5.5 km north)</p> <p><b>Timing:</b> May 2009</p>	<ul style="list-style-type: none"> <li>Desktop assessment</li> <li>151 detailed floristic sites (quadrats)</li> <li>29 relevé plots</li> <li>Opportunistic collections</li> <li>Targeted searching</li> </ul>	<ul style="list-style-type: none"> <li>501 plant taxa from 58 families and 172 genera</li> <li>30 vegetation associations</li> <li>Vegetation condition ranged from 'Pristine' to 'Completely Degraded'</li> <li>14 introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>One Threatened and seven Priority flora taxa recorded: <ul style="list-style-type: none"> <li><i>Lepidium catapycnon</i> (T) – now a P4</li> <li><i>Goodenia</i> sp. East Pilbara (AA Mitchell PRP 727) (P1) – now a P3</li> <li><i>Euphorbia</i> sp. Mt Bruce flats (S. van Leeuwen 3861) (P2)<sup>8</sup></li> <li><i>Vigna</i> sp. Central (M.E. Trudgen 1626) (P2)<sup>9</sup></li> <li><i>Acacia subtiliformis</i> (P3)</li> <li><i>Goodenia nuda</i> (P3) – now a P4</li> <li><i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794) (P3)</li> <li><i>Tephrosia</i> sp. Pilbara Ranges (S. van Leeuwen 4246) (P3)<sup>10</sup></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Poor seasonal conditions</li> </ul>
<p>ecologia (2006b)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Targeted flora survey</p> <p><b>Location:</b> Proposed ammonium nitrate storage facility (6.3 km north)</p> <p><b>Timing:</b> January 2006</p>	<ul style="list-style-type: none"> <li>Targeted searching</li> <li>Walking transects</li> </ul>	<ul style="list-style-type: none"> <li>64 plant taxa</li> <li>Two vegetation types</li> <li>One introduced flora taxon</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora recorded</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>
<p>ecologia (2006c)</p> <p><b>Client:</b> BHP Billiton Iron Ore</p> <p><b>Type:</b> Targeted flora survey</p> <p><b>Location:</b> Proposed ammonium nitrate storage facility (6.3 km north)</p> <p><b>Timing:</b> April 2006</p>	<ul style="list-style-type: none"> <li>Targeted searching</li> <li>Walking transects</li> </ul>	<ul style="list-style-type: none"> <li>122 plant taxa from 30 families and 58 genera</li> <li>Five vegetation types</li> <li>Three introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>No significant flora recorded</li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>

<sup>8</sup> *Euphorbia* sp. Mt Bruce flats (S. van Leeuwen 3861) is not current and is more recently known as *Euphorbia australis* var. *glabra*, a Priority 3 species.

<sup>9</sup> *Vigna* sp. Central (M.E. Trudgen 1626) is not current and is more recently known as *Vigna* sp. Hamersley clay (A.A. Mitchell PRP 113), which is not listed as a Priority flora species.

<sup>10</sup> *Tephrosia* sp. Pilbara Ranges (S. van Leeuwen 4246) is not current and is more recently known as *Tephrosia oxalidea* which is not listed as a Priority flora species.

Survey Details	Methods	Results	Significant Findings	Limitations
HGM (1997) <b>Client:</b> BHP Iron Ore Pty Ltd <b>Type:</b> Targeted Flora Survey <b>Location:</b> Mt Whaleback and surrounds (8 km northwest) <b>Timing:</b> November 1996 & January 1997	<ul style="list-style-type: none"> <li>Targeted searching</li> <li>Traversed transects</li> </ul>	<ul style="list-style-type: none"> <li>No introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>One significant flora taxon recorded: <ul style="list-style-type: none"> <li><i>Lepidium catapycnon</i> (T) – now a P4</li> </ul> </li> <li>3,184 live and 1,048 dead individuals of <i>Lepidium catapycnon</i></li> </ul>	<ul style="list-style-type: none"> <li>Poor seasonal conditions</li> </ul>
HGM (1999a) <b>Client:</b> BHP Iron Ore Pty Ltd <b>Type:</b> Targeted Flora Survey <b>Location:</b> Mt Whaleback and surrounds (8 km northwest) <b>Timing:</b> May 1999	<ul style="list-style-type: none"> <li>Follow up survey, relocating and resurveying identified and established populations</li> </ul>	<ul style="list-style-type: none"> <li>No introduced flora species</li> </ul>	<ul style="list-style-type: none"> <li>One significant flora taxon recorded: <ul style="list-style-type: none"> <li><i>Lepidium catapycnon</i> (T) – now a P4</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>No substantial limitations</li> </ul>



## Appendix H: Database Search Results

Family	Taxon	Source						Conservation Code			Introduced
		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Acanthaceae	<i>Dicladanthera forrestii</i>	•	•								
	<i>Dipteracanthus australasicus</i>		•								
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	•									
Aizoaceae	<i>Trianthema glossostigmum</i>	•	•								
	<i>Trianthema pilosum</i>	•	•								
	<i>Trianthema triquetrum</i>	•	•								
Alismataceae	<i>Sagittaria platyphylla</i>						•				Y
Amaranthaceae	<i>Alternanthera angustifolia</i>	•	•								
	<i>Alternanthera nana</i>	•	•								
	<i>Alternanthera nodiflora</i>	•	•								
	<i>Alternanthera pungens</i>	•	•								Y
	<i>Amaranthus centralis</i>				•			P3			
	<i>Amaranthus cuspidifolius</i>	•	•								
	<i>Amaranthus mitchellii</i>	•	•								
	<i>Amaranthus undulatus</i>	•	•								
	<i>Gomphrena canescens</i>	•	•								
	<i>Gomphrena cunninghamii</i>	•	•								
	<i>Gomphrena kanisii</i>	•	•								
	<i>Gomphrena lanata</i>	•	•								
	<i>Gomphrena sordida</i>	•	•								
	<i>Ptilotus aervoides</i>	•	•								
	<i>Ptilotus aphyllus</i>		•								
	<i>Ptilotus astrolasius</i>	•	•								
	<i>Ptilotus auriculifolius</i>	•	•								
	<i>Ptilotus axillaris</i>	•									
	<i>Ptilotus calostachyus</i>	•	•								
	<i>Ptilotus carinatus</i>	•	•								
	<i>Ptilotus clementii</i>	•	•								
	<i>Ptilotus exaltatus</i>	•									
	<i>Ptilotus fusiformis</i>	•	•								
	<i>Ptilotus gaudichaudii</i>	•	•								
	<i>Ptilotus gomphrenoides</i>	•	•								
	<i>Ptilotus helipteroides</i>	•	•								
	<i>Ptilotus incanus</i>	•	•								
	<i>Ptilotus nobilis</i>		•								
	<i>Ptilotus obovatus</i>	•	•								
	<i>Ptilotus polystachyus</i>	•	•								
	<i>Ptilotus rotundifolius</i>	•	•								
	<i>Ptilotus schwartzii</i>	•	•								
	<i>Ptilotus xerophilus</i>		•								
Apocynaceae	<i>Calotropis procera</i>						•				Y
	<i>Cryptostegia madagascariensis</i>						•				Y
	<i>Cynanchum floribundum</i>	•	•								
	<i>Gymnanthera cunninghamii</i>	•		•	•			P3			
Araceae	<i>Pistia stratiotes</i>						•				Y

Family	Taxon	Source						Conservation Code			Introduced
		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Araceae cont.	<i>Zantedeschia aethiopica</i>						•				Y
Araliaceae	<i>Astrotricha hamptonii</i>	•	•								
	<i>Hydrocotyle ranunculoides</i>						•				Y
	<i>Trachymene bialata</i>	•	•								
	<i>Trachymene glaucifolia</i>		•								
	<i>Trachymene oleracea</i>	•	•								
	<i>Trachymene oleracea</i> subsp. <i>oleracea</i>	•									
Asparagaceae	<i>Asparagus asparagoides</i>						•				Y
Asteraceae cont.	<i>Actinobole oldfieldianum</i>	•	•								
	<i>Bidens bipinnata</i>	•	•								Y
	<i>Bidens subalternans</i>		•								Y
	<i>Bidens subalternans</i> var. <i>araneosa</i>	•									Y
	<i>Bidens subalternans</i> var. <i>simulans</i>	•									Y
	<i>Brachyscome ciliaris</i>		•								
	<i>Brachyscome rudallensis</i>	•	•								
	<i>Calocephalus beardii</i>	•	•								
	<i>Calocephalus knappii</i>		•								
	<i>Calocephalus pilbarensis</i>	•	•								
	<i>Calotis hispidula</i>	•	•								
	<i>Calotis latiuscula</i>	•									
	<i>Calotis multicaulis</i>	•	•								
	<i>Calotis plumulifera</i>	•	•								
	<i>Centipeda minima</i>		•								
	<i>Centipeda minima</i> subsp. <i>macrocephala</i>	•									
	<i>Chondrilla juncea</i>						•				Y
	<i>Chrysocephalum apiculatum</i>	•	•								
	<i>Chrysocephalum gilesii</i>		•								
	<i>Chrysocephalum pterochaetum</i>	•	•								
	<i>Erigeron bonariensis</i>		•								Y
	<i>Erigeron</i> sp.	•									Y
	<i>Flaveria trinervia</i>	•	•								Y
	<i>Gnephosis arachnoidea</i>		•								
	<i>Ixiochlamys cuneifolia</i>	•	•								
	<i>Lactuca saligna</i>	•	•								Y
	<i>Leiocarpa semicalva</i>		•								
	<i>Leiocarpa semicalva</i> subsp. <i>semicalva</i>	•									
	<i>Minuria integerrima</i>	•	•								
	<i>Olearia fluvialis</i>		•								
	<i>Olearia xerophila</i>		•								
	<i>Onopordum acaulon</i>						•				Y
	<i>Peripleura virgata</i>	•									
	<i>Pluchea ferdinandi-muelleri</i>		•								
	<i>Podolepis capillaris</i>	•	•								
	<i>Pterocaulon sphacelatum</i>	•	•								
	<i>Rhodanthe charsleyae</i>	•	•								



Family	Taxon	Source						Conservation Code			Introduced
		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Asteraceae cont.	<i>Rhodanthe floribunda</i>	•	•								
	<i>Rhodanthe margarethae</i>	•	•								
	<i>Rhodanthe polakii</i>	•	•								
	<i>Rhodanthe propinqua</i>		•								
	<i>Rhodanthe sterilescens</i>	•	•								
	<i>Rhodanthe stricta</i>	•	•								
	<i>Roebuckiella similis</i>	•	•								
	<i>Rutidosia helichrysoides</i>	•	•								
	<i>Rutidosia helichrysoides</i> subsp. <i>helichrysoides</i>	•									
	<i>Silybum marianum</i>						•				Y
	<i>Sonchus asper</i>		•								Y
	<i>Sonchus oleraceus</i>	•	•								Y
	<i>Streptoglossa cylindriceps</i>	•	•								
	<i>Streptoglossa decurrens</i>	•	•								
	<i>Streptoglossa liatroides</i>	•	•								
	<i>Streptoglossa odora</i>	•	•								
	<i>Symphotrichum squamatum</i>	•	•								Y
	<i>Vittadinia arida</i>		•								
	<i>Vittadinia eremaea</i>	•	•								
	<i>Vittadinia virgata</i>		•								
	<i>Xanthium spinosum</i>						•				Y
	<i>Xanthium strumarium</i>						•				Y
Boraginaceae	<i>Echium plantagineum</i>						•				Y
	<i>Halgania erecta</i>	•	•								
	<i>Halgania solanacea</i>		•								
	<i>Heliotropium cunninghamii</i>	•	•								
	<i>Heliotropium heteranthum</i>	•	•								
	<i>Heliotropium ovalifolium</i>		•								
	<i>Heliotropium pachyphyllum</i>	•	•								
	<i>Heliotropium tanythrix</i>	•	•								
	<i>Heliotropium tenuifolium</i>	•	•								
	<i>Trichodesma zeylanicum</i>	•	•								
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	•									
Brassicaceae	<i>Lepidium catapycnon</i>	•	•	•	•			P4			
	<i>Lepidium echinatum</i>	•	•								
	<i>Lepidium muelleri-ferdinandii</i>		•								
	<i>Lepidium oxytrichum</i>		•								
	<i>Lepidium pedicellosum</i>	•	•								
	<i>Lepidium phlebopetalum</i>	•	•								
	<i>Lepidium pholidogynum</i>		•								
	<i>Lepidium platypetalum</i>	•	•								
	<i>Stenopetalum decipiens</i>	•	•								
	<i>Stenopetalum nutans</i>		•								
	<i>Stenopetalum velutinum</i>	•	•								
Cactaceae	<i>Austrocylindropuntia cylindrica</i>						•				Y

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		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Cactaceae cont.	<i>Austrocylindropuntia subulata</i>						•				Y
	<i>Cylindropuntia fulgida</i>						•				Y
	<i>Cylindropuntia imbricata</i>						•				Y
	<i>Cylindropuntia kleiniae</i>						•				Y
	<i>Cylindropuntia pallida</i>						•				Y
	<i>Cylindropuntia tunicata</i>						•				Y
	<i>Opuntia elata</i>						•				Y
	<i>Opuntia elatior</i>						•				Y
	<i>Opuntia engelmannii</i>						•				Y
	<i>Opuntia ficus-indica</i>						•				Y
	<i>Opuntia microdasys</i>						•				Y
	<i>Opuntia monacantha</i>						•				Y
	<i>Opuntia polyacantha</i>						•				Y
	<i>Opuntia puberula</i>						•				Y
	<i>Opuntia stricta</i>						•				Y
	<i>Opuntia tomentosa</i>						•				Y
Campanulaceae	<i>Wahlenbergia tumidifructa</i>	•	•								
Capparaceae	<i>Capparis lasiantha</i>	•	•								
	<i>Capparis umbonata</i>	•	•								
Caryophyllaceae	<i>Polycarpaea corymbosa</i>		•								
	<i>Polycarpaea holtzei</i>	•	•								
	<i>Polycarpaea involucrata</i>	•	•								
	<i>Polycarpaea longiflora</i>	•	•								
Celastraceae	<i>Maytenus</i> sp. Mt Windell (S. van Leeuwen 846)	•	•								
	<i>Stackhousia intermedia</i>	•	•								
	<i>Stackhousia</i> sp. swollen gynophore (W.R. Barker 2041)	•									
Chenopodiaceae cont.	<i>Atriplex codonocarpa</i>	•	•								
	<i>Atriplex lindleyi</i>		•								
	<i>Atriplex semilunaris</i>	•	•								
	<i>Atriplex vesicaria</i>	•	•								
	<i>Dysphania kalpari</i>		•								
	<i>Dysphania melanocarpa</i>	•	•								
	<i>Dysphania rhadinostachya</i>		•								
	<i>Dysphania rhadinostachya</i> subsp. <i>rhadinostachya</i>	•									
	<i>Enchylaena tomentosa</i>		•								
	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	•									
	<i>Maireana carnosa</i>	•	•								
	<i>Maireana georgei</i>	•	•								
	<i>Maireana melanocoma</i>	•	•								
	<i>Maireana planifolia</i>	•	•								
	<i>Maireana prosthecochaeta</i>	•		•	•			P3			
	<i>Maireana pyramidata</i>		•								
	<i>Maireana tomentosa</i>	•	•								
	<i>Maireana triptera</i>		•								
	<i>Maireana villosa</i>		•								

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Chenopodiaceae cont.	<i>Rhagodia eremaea</i>	•	•								
	<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794)	•		•	•			P3			
	<i>Salsola australis</i>	•	•								
	<i>Sclerolaena convexula</i>	•	•								
	<i>Sclerolaena cornishiana</i>	•	•								
	<i>Sclerolaena costata</i>		•								
	<i>Sclerolaena cuneata</i>	•	•								
	<i>Sclerolaena densiflora</i>		•								
	<i>Sclerolaena diacantha</i>		•								
	<i>Sclerolaena lanicuspis</i>	•	•								
	<i>Sclerolaena minuta</i>	•	•								
	<i>Tecticornia disarticulata</i>	•	•								
Cleomaceae	<i>Areocleome oxalidea</i>	•	•								
	<i>Arivela viscosa</i>		•								
Colchicaceae	<i>Wurmbea deserticola</i>	•	•								
Convolvulaceae	<i>Bonamia erecta</i>	•	•								
	<i>Bonamia pilbarensis</i>	•	•								
	<i>Convolvulus clementii</i>	•	•								
	<i>Evolvulus alsinoides</i>		•								
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	•									
	<i>Ipomoea costata</i>	•	•								
	<i>Ipomoea lonchophylla</i>	•	•								
	<i>Ipomoea muelleri</i>	•	•								
	<i>Ipomoea pes-caprae</i>		•								
	<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i>	•									
	<i>Ipomoea plebeia</i>	•	•								
	<i>Ipomoea racemigera</i>	•	•	•				P2			
	<i>Operculina aequisepala</i>	•	•								
	<i>Polymeria ambigua</i>		•								
	<i>Polymeria calycina</i>	•	•								
	<i>Polymeria</i> sp.	•									
Cucurbitaceae	<i>Austrobryonia pilbarensis</i>		•								
	<i>Citrullus amarus</i>	•	•								Y
Cyperaceae cont.	<i>Bulbostylis barbata</i>	•	•								
	<i>Bulbostylis turbinata</i>	•	•								
	<i>Cyperus betchei</i>		•								
	<i>Cyperus betchei</i> subsp. <i>commiscens</i>	•									
	<i>Cyperus bifax</i>	•	•								
	<i>Cyperus cunninghamii</i>		•								
	<i>Cyperus cunninghamii</i> subsp. <i>cunninghamii</i>	•									
	<i>Cyperus ixiocarpus</i>	•	•								
	<i>Cyperus pulchellus</i>		•								
	<i>Cyperus tenuiflorus</i>	•	•								Y
	<i>Cyperus vaginatus</i>	•	•								
	<i>Eleocharis pallens</i>	•	•								



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		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Cyperaceae cont.	<i>Fimbristylis dichotoma</i>	•	•								
	<i>Fimbristylis microcarya</i>	•	•								
	<i>Fimbristylis simulans</i>	•	•								
	<i>Fimbristylis</i> sp.	•									
	<i>Schoenoplectiella laevis</i>	•	•								
Droseraceae	<i>Drosera finlaysoniana</i>	•	•								
	<i>Drosera indica</i>		•								
Elatinaceae	<i>Bergia pedicellaris</i>	•	•								
Euphorbiaceae	<i>Euphorbia australis</i>		•								
	<i>Euphorbia australis</i> var. <i>subtomentosa</i>	•									
	<i>Euphorbia biconvexa</i>	•	•								
	<i>Euphorbia careyi</i>	•	•								
	<i>Euphorbia coghlanii</i>	•	•								
	<i>Euphorbia inappendiculata</i> var. <i>inappendiculata</i>			•				P2			
	<i>Euphorbia porcata</i>		•								
	<i>Euphorbia tannensis</i>		•								
	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	•									
	<i>Jatropha gossypifolia</i>						•				Y
Fabaceae cont.	<i>Acacia acradenia</i>	•	•								
	<i>Acacia adoxa</i>		•								
	<i>Acacia adoxa</i> var. <i>adoxo</i>	•									
	<i>Acacia adoxa</i> var. <i>adoxo</i> x <i>spondylophylla</i>	•									
	<i>Acacia adsurgens</i>	•	•								
	<i>Acacia ampliceps</i>	•	•								
	<i>Acacia ancistrocarpa</i>	•	•								
	<i>Acacia aneura</i>		•								
	<i>Acacia aptaneura</i>	•	•								
	<i>Acacia arida</i>	•	•								
	<i>Acacia atkinsiana</i>	•	•								
	<i>Acacia ayersiana</i>	•	•								
	<i>Acacia bivenosa</i>	•	•								
	<i>Acacia bromilowiana</i>			•	•			P4			
	<i>Acacia catenulata</i>		•								
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	•									
	<i>Acacia citrinoviridis</i>	•	•								
	<i>Acacia coolgardiensis</i>		•								
	<i>Acacia coriacea</i>	•	•								
	<i>Acacia coriacea</i> subsp. <i>pendens</i>	•									
	<i>Acacia corusca</i>			•				P1			
	<i>Acacia cuspidifolia</i>	•	•								
	<i>Acacia dictyophleba</i>	•	•								
	<i>Acacia elachantha</i>	•	•								
	<i>Acacia eriopoda</i>	•	•								
	<i>Acacia fuscaneura</i>		•								
	<i>Acacia hamersleyensis</i>	•	•								

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		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Fabaceae cont.	<i>Acacia hilliana</i>	•	•								
	<i>Acacia inaequilatera</i>	•	•								
	<i>Acacia incurvaneura</i>	•	•								
	<i>Acacia intorta</i>	•									
	<i>Acacia kempeana</i>		•								
	<i>Acacia ligulata</i>		•								
	<i>Acacia macraneura</i>	•	•								
	<i>Acacia maitlandii</i>	•	•								
	<i>Acacia marramamba</i>	•	•								
	<i>Acacia melleodora</i>	•	•								
	<i>Acacia monticola</i>	•	•								
	<i>Acacia mulganeura</i>		•								
	<i>Acacia pachyacra</i>	•	•								
	<i>Acacia pachycarpa</i>	•	•								
	<i>Acacia paraneura</i>	•	•								
	<i>Acacia pruinocarpa</i>	•	•								
	<i>Acacia pteraneura</i>		•								
	<i>Acacia ptychophylla</i>	•	•								
	<i>Acacia pyrifolia</i>		•								
	<i>Acacia pyrifolia</i> var. <i>morrisonii</i>	•									
	<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>	•									
	<i>Acacia rhodophloia</i>	•	•								
	<i>Acacia rhodophloia</i> x <i>sibirica</i>	•	•								
	<i>Acacia sclerosperma</i>		•								
	<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	•									
	<i>Acacia sericophylla</i>	•	•								
	<i>Acacia sibirica</i>	•	•								
	<i>Acacia</i> sp. Jimblebar (S. van Leeuwen 1342)	•	•								
	<i>Acacia spondylophylla</i>	•	•								
	<i>Acacia subcontorta</i>		•								
	<i>Acacia subtiliformis</i>			•	•			P3			
	<i>Acacia synchronicia</i>	•	•								
	<i>Acacia tenuissima</i>	•	•								
	<i>Acacia tetragonophylla</i>	•	•								
	<i>Acacia trudgeniana</i>		•								
	<i>Acacia tumida</i>		•								
	<i>Acacia victoriae</i>	•	•								
	<i>Acacia wanyu</i>	•	•								
	<i>Aenictophyton reconditum</i>		•								
	<i>Alhagi maurorum</i>						•				Y
	<i>Crotalaria medicaginea</i>		•								
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	•									
	<i>Crotalaria smithiana</i>			•				P3			
	<i>Cullen cinereum</i>	•	•								
	<i>Cullen graveolens</i>	•	•								

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Fabaceae cont.	<i>Cullen lachnostachys</i>		•								
	<i>Cullen leucanthum</i>	•	•								
	<i>Cullen leucochaites</i>	•	•								
	<i>Cullen pogonocarpum</i>	•	•								
	<i>Desmanthus virgatus</i>	•	•								Y
	<i>Desmodium campylocaulon</i>	•	•								
	<i>Desmodium filiforme</i>	•	•								
	<i>Glycine canescens</i>		•								
	<i>Gompholobium oreophilum</i>	•	•								
	<i>Gompholobium polyzygum</i>		•								
	<i>Indigofera colutea</i>	•	•								
	<i>Indigofera georgei</i>	•	•								
	<i>Indigofera gilesii</i>	•	•	•	•			P3			
	<i>Indigofera monophylla</i>	•	•								
	<i>Indigofera rugosa</i>	•	•								
	<i>Isotropis atropurpurea</i>	•	•								
	<i>Isotropis iophyta</i>	•									
	<i>Isotropis parviflora</i>	•		•				P2			
	<i>Jacksonia aculeata</i>	•	•								
	<i>Kennedia prorepens</i>	•	•								
	<i>Lotus cruentus</i>	•	•								
	<i>Mirbelia ramulosa</i>	•									
	<i>Mirbelia viminalis</i>	•	•								
	<i>Muelleranthus trifoliolatus</i>	•	•								
	<i>Neptunia dimorphantha</i>	•	•								
	<i>Parkinsonia aculeata</i>						•				Y
	<i>Petalostylis cassioides</i>	•	•								
	<i>Petalostylis labicheoides</i>	•	•								
	<i>Prosopis glandulosa</i> x <i>velutina</i>						•				Y
	<i>Rhynchosia australis</i>	•	•								
	<i>Rhynchosia minima</i>		•								
	<i>Senna alata</i>						•				Y
	<i>Senna artemisioides</i>	•	•								
	<i>Senna artemisioides</i> subsp. <i>filifolia</i>	•									
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	•									
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	•									
	<i>Senna ferraria</i>	•	•								
	<i>Senna glaucifolia</i>	•	•								
	<i>Senna glutinosa</i>		•								
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	•									
	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	•									
	<i>Senna glutinosa</i> subsp. x <i>luerssenii</i>	•									
	<i>Senna hamersleyensis</i>	•	•								
	<i>Senna notabilis</i>	•	•								
	<i>Senna obtusifolia</i>						•				Y



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Fabaceae cont.	<i>Senna occidentalis</i>	•	•								Y
	<i>Senna</i> sp. Billabong (J.D. Alonzo 721)	•	•								
	<i>Senna</i> sp. Meekatharra (E. Bailey 1-26)	•	•								
	<i>Senna stricta</i>	•	•								
	<i>Senna venusta</i>	•	•								
	<i>Swainsona decurrens</i>	•	•								
	<i>Swainsona formosa</i>		•								
	<i>Swainsona leeana</i>	•	•								
	<i>Swainsona thompsoniana</i>			•				P3			
	<i>Tephrosia densa</i>	•	•								
	<i>Tephrosia oxalidea</i>	•	•								
	<i>Tephrosia rosea</i>		•								
	<i>Tephrosia rosea</i> var. Fortescue creeks (M.I.H. Brooker 2186)	•									
	<i>Tephrosia</i> sp. clay soils (S. van Leeuwen et al. PBS 0273)	•	•								
	<i>Tephrosia</i> sp. deserts (J.R. Maconochie 1403)		•								
	<i>Tephrosia</i> sp. Newman (A.A. Mitchell PRP 29)	•	•								
	<i>Tephrosia</i> sp. Willowra (G.M. Chippendale 4809)		•								
	<i>Tephrosia supina</i>	•	•								
	<i>Ulex europaeus</i>						•				Y
	<i>Vigna</i> sp. Hamersley Clay (A.A. Mitchell PRP 113)	•	•								
Frankeniaceae	<i>Frankenia setosa</i>	•	•								
Geraniaceae	<i>Erodium cygnorum</i>	•	•								
Goodeniaceae cont.	<i>Brunonia australis</i>	•	•								
	<i>Brunonia australis</i> var. A Kimberley Flora (K.F. Kenneally 5452)	•									
	<i>Dampiera candicans</i>	•	•								
	<i>Dampiera cinerea</i>	•	•								
	<i>Dampiera metallorum</i>			•				P3			
	<i>Goodenia azurea</i>		•								
	<i>Goodenia azurea</i> subsp. <i>hesperia</i>	•									
	<i>Goodenia berringbinensis</i>	•		•				P4			
	<i>Goodenia forrestii</i>	•	•								
	<i>Goodenia hartiana</i>			•	•			P2			
	<i>Goodenia lamprosperma</i>	•	•								
	<i>Goodenia microptera</i>	•	•								
	<i>Goodenia mimuloides</i>		•								
	<i>Goodenia muelleriana</i>	•	•								
	<i>Goodenia nuda</i>	•		•				P4			
	<i>Goodenia pascua</i>		•								
	<i>Goodenia prostrata</i>	•	•								
	<i>Goodenia ramelii</i>	•	•								
	<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727)	•		•	•			P3			
	<i>Goodenia</i> sp. Sandy Creek (R.D. Royce 1653)	•	•								
	<i>Goodenia stellata</i>		•								
	<i>Goodenia stobbsiana</i>	•	•								
	<i>Goodenia tenuiloba</i>	•	•								

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Goodeniaceae cont.	<i>Goodenia triodiophila</i>	•	•								
	<i>Goodenia vilmorinae</i>	•	•								
	<i>Scaevola acacioides</i>	•	•								
	<i>Scaevola browniana</i>	•	•								
	<i>Scaevola browniana</i> subsp. <i>browniana</i>	•									
	<i>Scaevola parvifolia</i>		•								
	<i>Scaevola parvifolia</i> subsp. <i>pilbarae</i>	•									
	<i>Scaevola</i> sp. Mt Nameless (P.A.S. Wurm 1443)	•	•								
	<i>Scaevola spinescens</i>	•	•								
	<i>Velleia connata</i>		•								
	<i>Velleia glabrata</i>	•									
Gyrostemonaceae	<i>Codonocarpus cotinifolius</i>	•	•								
Haloragaceae	<i>Gonocarpus ephemerus</i>	•	•								
	<i>Haloragis gossei</i>	•	•								
	<i>Haloragis gossei</i> var. <i>gossei</i>	•									
	<i>Haloragis maierae</i>	•	•								
Hemerocallidaceae	<i>Tricoryne</i> sp. Hamersley Range (S. van Leeuwen 915)		•								
Iridaceae	<i>Moraea flaccida</i>						•				Y
	<i>Moraea miniata</i>						•				Y
Lamiaceae	<i>Clerodendrum floribundum</i>		•								
	<i>Clerodendrum floribundum</i> var. <i>angustifolium</i>	•									
	<i>Dicrastylis cordifolia</i>	•	•								
	<i>Dicrastylis kumarinensis</i>	•	•								
	<i>Newcastelia cephalantha</i>	•	•								
	<i>Newcastelia</i> sp. Hamersley Range (S. van Leeuwen 4264)	•	•								
	<i>Pityrodia augustensis</i>					•		T		VUL	
Lauraceae	<i>Cassytha capillaris</i>	•	•								
Loganiaceae	<i>Mitrasacme connata</i>	•	•								
Loranthaceae	<i>Amyema bifurcata</i>	•	•								
	<i>Amyema fitzgeraldii</i>	•	•								
	<i>Amyema gibberula</i>		•								
	<i>Amyema gibberula</i> var. <i>gibberula</i>	•									
	<i>Amyema hilliana</i>	•	•								
	<i>Amyema preissii</i>	•	•								
	<i>Lysiana casuarinae</i>	•	•								
	<i>Lysiana murrayi</i>		•								
	<i>Lysiana subfalcata</i>		•								
Lythraceae	<i>Ammannia multiflora</i>	•	•								
	<i>Rotala diandra</i>	•	•								
Malvaceae	<i>Abutilon amplum</i>	•	•								
	<i>Abutilon cryptopetalum</i>		•								
	<i>Abutilon cunninghamii</i>	•	•								
	<i>Abutilon fraseri</i>	•	•								
	<i>Abutilon lepidum</i>	•	•								
	<i>Abutilon macrum</i>		•								

Family	Taxon	Source						Conservation Code			Introduced
		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Malvaceae cont.	<i>Abutilon malvifolium</i>	•	•								
	<i>Abutilon otocarpum</i>	•	•								
	<i>Abutilon oxycarpum</i>	•	•								
	<i>Abutilon</i> sp. Dioicum (A.A. Mitchell PRP 1618)	•	•								
	<i>Abutilon</i> sp. Pilbara (W.R. Barker 2025)	•	•								
	<i>Androcalva loxophylla</i>		•								
	<i>Androcalva luteiflora</i>	•	•								
	<i>Corchorus crozophorifolius</i>	•	•								
	<i>Corchorus laniflorus</i>		•								
	<i>Corchorus lasiocarpus</i>	•	•								
	<i>Corchorus lasiocarpus</i> subsp. <i>lasiocarpus</i>	•									
	<i>Corchorus lasiocarpus</i> subsp. <i>parvus</i>	•									
	<i>Corchorus</i> sp. Hamersley Range hilltops (S. van Leeuwen 3826)	•	•								
	<i>Corchorus tridens</i>	•	•								
	<i>Corchorus walcottii</i>		•								
	<i>Gossypium sturtianum</i>		•								
	<i>Gossypium sturtianum</i> var. <i>sturtianum</i>	•									
	<i>Hibiscus austrinus</i>		•								
	<i>Hibiscus austrinus</i> var. <i>austrinus</i>	•									
	<i>Hibiscus burtonii</i>	•	•								
	<i>Hibiscus campanulatus</i>	•						P1			
	<i>Hibiscus coatesii</i>	•	•								
	<i>Hibiscus goldsworthii</i>	•	•								
	<i>Hibiscus haynaldii</i>	•	•								
	<i>Hibiscus sturtii</i>	•	•								
	<i>Hibiscus sturtii</i> var. <i>grandiflorus</i>	•									
	<i>Hibiscus sturtii</i> var. <i>truncatus</i>	•									
	<i>Hibiscus verdcourtii</i>	•	•								
	<i>Malvastrum americanum</i>	•	•								Y
	<i>Seringia exastia</i>	•									
	<i>Seringia nephrosperma</i>	•	•								
	<i>Sida arenicola</i>	•	•								
	<i>Sida brownii</i>	•	•								
	<i>Sida calyxhymania</i>	•	•								
	<i>Sida cardiophylla</i>	•	•								
	<i>Sida corrugata</i>		•								
	<i>Sida echinocarpa</i>	•	•								
	<i>Sida ectogama</i>		•								
	<i>Sida fibulifera</i>	•	•								
	<i>Sida</i> sp. Excedentifolia (J.L. Egan 1925)	•	•								
	<i>Sida</i> sp. Kathleen Springs (A.C. Beaglehole 26934)		•								
	<i>Sida</i> sp. L (A.M. Ashby 4202)	•	•								
	<i>Sida</i> sp. Pilbara (A.A. Mitchell PRP 1543)	•	•								
	<i>Sida</i> sp. Shovelanna Hill (S. van Leeuwen 3842)	•	•								
	<i>Sida</i> sp. spiciform panicles (E. Leyland s.n. 14/8/90)	•	•								



Family	Taxon	Source						Conservation Code			Introduced
		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Malvaceae cont.	<i>Sida</i> sp. tiny glabrous fruit (A.A. Mitchell PRP1152)	•									
	<i>Sida trichopoda</i>	•	•								
	<i>Triumfetta leptacantha</i>	•	•								
	<i>Triumfetta maconochieana</i>	•	•								
	<i>Waltheria virgata</i>		•								
Marsileaceae	<i>Marsilea exarata</i>	•	•								
	<i>Marsilea hirsuta</i>	•	•								
Molluginaceae	<i>Hypertelis cerviana</i>		•								
	<i>Trigastrotheca molluginea</i>		•								
Moraceae	<i>Ficus brachypoda</i>	•	•								
Myrtaceae	<i>Calytrix carinata</i>	•	•								
	<i>Corymbia aspera</i>	•	•								
	<i>Corymbia candida</i>	•	•								
	<i>Corymbia candida</i> subsp. <i>dipsodes</i>	•									
	<i>Corymbia deserticola</i>		•								
	<i>Corymbia deserticola</i> subsp. <i>deserticola</i>	•									
	<i>Corymbia ferriticola</i>	•	•								
	<i>Corymbia hamersleyana</i>	•	•								
	<i>Corymbia lenziana</i>		•								
	<i>Corymbia opaca</i>	•	•								
	<i>Corymbia terminalis</i>		•								
	<i>Eucalyptus camaldulensis</i>		•								
	<i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>	•									
	<i>Eucalyptus ewartiana</i>	•	•								
	<i>Eucalyptus gamophylla</i>	•	•								
	<i>Eucalyptus kingsmillii</i>	•	•								
	<i>Eucalyptus leucophloia</i>		•								
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	•									
	<i>Eucalyptus lucasii</i>	•	•								
	<i>Eucalyptus patellaris</i>		•								
	<i>Eucalyptus pilbarensis</i>		•								
	<i>Eucalyptus repullulans</i>	•	•								
	<i>Eucalyptus socialis</i>	•	•								
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	•									
	<i>Eucalyptus striaticalyx</i>		•								
	<i>Eucalyptus trivalva</i>	•	•								
	<i>Eucalyptus victrix</i>	•	•								
	<i>Eucalyptus xerothermica</i>	•	•								
	<i>Lamarchea sulcata</i>	•	•								
	<i>Melaleuca eleuterostachya</i>		•								
	<i>Melaleuca glomerata</i>	•	•								
Nyctaginaceae	<i>Boerhavia repleta</i>	•	•								
Oleaceae	<i>Jasminum didymum</i>		•								
	<i>Jasminum didymum</i> subsp. <i>lineare</i>	•									
Oxalidaceae	<i>Oxalis</i> sp. Pilbara (M.E. Trudgen 12725)			•				P2			

Family	Taxon	Source						Conservation Code			Introduced
		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Phrymaceae	<i>Mimulus gracilis</i>	•	•								
	<i>Peplidium maritimum</i>		•								
Phyllanthaceae	<i>Phyllanthus virgatus</i>	•	•								
	<i>Synostemon rhytidospermus</i>	•	•								
Plantaginaceae	<i>Stemodia viscosa</i>	•	•								
Plumbaginaceae	<i>Plumbago zeylanica</i>	•	•								
Poaceae	<i>Amphipogon caricinus</i>	•	•								
	<i>Amphipogon sericeus</i>	•	•								
	<i>Aristida burbidgeae</i>	•	•								
	<i>Aristida contorta</i>	•	•								
	<i>Aristida inaequiglumis</i>	•	•								
	<i>Aristida jerichoensis</i> var. <i>subspinulifera</i>	•		•				P3			
	<i>Aristida latifolia</i>	•	•								
	<i>Aristida lazardis</i>			•				P2			
	<i>Aristida nitidula</i>	•									
	<i>Aristida obscura</i>	•	•								
	<i>Aristida</i> sp.	•									
	<i>Astrebla elymoides</i>	•	•								
	<i>Austrostipa nitida</i>	•	•								
	<i>Brachyachne prostrata</i>		•								
	<i>Cenchrus ciliaris</i>	•	•			•					Y
	<i>Cenchrus setiger</i>	•	•								Y
	<i>Chloris pectinata</i>	•	•								
	<i>Chloris pumilio</i>	•	•								
	<i>Chloris</i> sp.	•									
	<i>Chloris virgata</i>	•	•								Y
	<i>Chrysopogon fallax</i>	•	•								
	<i>Cymbopogon ambiguus</i>	•	•								
	<i>Cynodon convergens</i>	•	•								
	<i>Cynodon dactylon</i>	•	•								Y
	<i>Cynodon prostratus</i>	•	•								
	<i>Dactyloctenium radulans</i>	•	•								
	<i>Dichanthium fecundum</i>	•	•								
	<i>Dichanthium sericeum</i>		•								
	<i>Dichanthium sericeum</i> subsp. <i>humilius</i>	•									
	<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	•									
	<i>Digitaria ammophila</i>	•	•								
	<i>Digitaria brownii</i>	•	•								
	<i>Digitaria ciliaris</i>		•								Y
	<i>Digitaria ctenantha</i>	•	•								
	<i>Diplachne fusca</i>		•								Y
	<i>Diplachne fusca</i> subsp. <i>muelleri</i>	•									
	<i>Echinochloa colona</i>	•	•								Y
	<i>Elytrophorus spicatus</i>	•	•								
	<i>Enneapogon avenaceus</i>	•	•								

Family	Taxon	Source						Conservation Code			Introduced
		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Poaceae cont.	<i>Enneapogon caeruleus</i>	•	•								
	<i>Enneapogon lindleyanus</i>	•	•								
	<i>Enneapogon polyphyllus</i>	•	•								
	<i>Enneapogon robustissimus</i>	•	•								
	<i>Enteropogon ramosus</i>	•	•								
	<i>Eragrostis cumingii</i>		•								
	<i>Eragrostis dielsii</i>	•	•								
	<i>Eragrostis elongata</i>	•	•								
	<i>Eragrostis eriopoda</i>	•	•								
	<i>Eragrostis lanipes</i>	•	•								
	<i>Eragrostis leptocarpa</i>	•	•								
	<i>Eragrostis olida</i>	•	•								
	<i>Eragrostis setifolia</i>	•	•								
	<i>Eragrostis speciosa</i>	•	•								
	<i>Eragrostis tenellula</i>	•	•								
	<i>Eragrostis xerophila</i>		•								
	<i>Eriachne aristidea</i>		•								
	<i>Eriachne benthamii</i>		•								
	<i>Eriachne flaccida</i>		•								
	<i>Eriachne lanata</i>	•	•								
	<i>Eriachne mucronata</i>	•	•								
	<i>Eriachne obtusa</i>	•	•								
	<i>Eriachne pulchella</i>		•								
	<i>Eriachne pulchella</i> subsp. <i>dominii</i>	•									
	<i>Eriachne pulchella</i> subsp. <i>pulchella</i>	•									
	<i>Eriachne tenuiculmis</i>	•	•								
	<i>Eriochloa pseudoacrotricha</i>	•	•								
	<i>Eulalia aurea</i>	•	•								
	<i>Iseilema dolichotrichum</i>	•	•								
	<i>Iseilema eremaeum</i>	•	•								
	<i>Iseilema membranaceum</i>	•	•								
	<i>Iseilema vaginiflorum</i>	•	•								
	<i>Leptochloa digitata</i>	•	•								
	<i>Monachather paradoxus</i>		•								
	<i>Panicum decompositum</i>	•	•								
	<i>Panicum effusum</i>	•	•								
	<i>Paraneurachne muelleri</i>	•	•								
	<i>Paspalidium clementii</i>	•	•								
	<i>Paspalidium constrictum</i>	•	•								
	<i>Paspalidium rarum</i>	•	•								
	<i>Perotis rara</i>	•	•								
	<i>Schizachyrium fragile</i>	•	•								
	<i>Setaria dielsii</i>	•	•								
	<i>Setaria surgens</i>	•	•								
	<i>Setaria verticillata</i>	•	•								Y



Family	Taxon	Source						Conservation Code			Introduced
		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Poaceae cont.	<i>Sorghum plumosum</i>		•								
	<i>Sporobolus actinocladus</i>	•	•								
	<i>Sporobolus australasicus</i>	•	•								
	<i>Themeda</i> sp. Hamersley Station (M.E. Trudgen 11431)	•		•				P3			
	<i>Themeda triandra</i>	•	•								
	<i>Thyridolepis mitchelliana</i>		•								
	<i>Thyridolepis xerophila</i>	•	•								
	<i>Tragus australianus</i>	•	•								
	<i>Triodia angusta</i>	•	•								
	<i>Triodia basedowii</i>	•	•								
	<i>Triodia bitextura</i>		•								
	<i>Triodia brizoides</i>	•	•								
	<i>Triodia epactia</i>		•								
	<i>Triodia longiceps</i>	•	•								
	<i>Triodia melvillei</i>	•	•								
	<i>Triodia pungens</i>	•	•								
	<i>Triodia schinzii</i>	•	•								
	<i>Triodia</i> sp. Mt Ella (M.E. Trudgen 12739)	•		•				P3			
	<i>Triodia vanleeuwenii</i>	•	•								
	<i>Triodia wiseana</i>	•	•								
	<i>Triraphis mollis</i>	•	•								
	<i>Urochloa piligera</i>	•	•								
	<i>Urochloa subquadripara</i>		•								
	<i>Vittadinia</i> sp. Coondewanna Flats (S. van Leeuwen 4684)			•				P1			
	<i>Xerochloa imberbis</i>	•	•								
	<i>Yakirra australiensis</i>		•								
	<i>Yakirra australiensis</i> var. <i>australiensis</i>	•									
Polygalaceae	<i>Polygala glaucifolia</i>	•	•								
Polygonaceae	<i>Rumex vesicarius</i>	•	•								Y
Portulacaceae	<i>Calandrinia ptychosperma</i>	•	•								
	<i>Calandrinia quadrivalvis</i>		•								
	<i>Calandrinia reticulata</i>	•	•								
	<i>Calandrinia schistorhiza</i>	•	•								
	<i>Calandrinia stagnensis</i>		•								
	<i>Calandrinia tepperiana</i>	•									
	<i>Portulaca cyclophylla</i>	•	•								
	<i>Portulaca decipiens</i>	•	•								
	<i>Portulaca filifolia</i>	•	•								
	<i>Portulaca intraterranea</i>	•	•								
	<i>Portulaca oleracea</i>		•								
Proteaceae	<i>Grevillea berryana</i>		•								
	<i>Grevillea juncifolia</i>		•								
	<i>Grevillea juncifolia</i> subsp. <i>juncifolia</i>	•									
	<i>Grevillea pyramidalis</i>	•	•								
	<i>Grevillea stenobotrya</i>	•									

Family	Taxon	Source						Conservation Code			Introduced
		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Proteaceae cont.	<i>Grevillea striata</i>	•	•								
	<i>Grevillea wickhamii</i>		•								
	<i>Grevillea wickhamii</i> subsp. <i>aprica</i>	•									
	<i>Grevillea wickhamii</i> subsp. <i>hispidula</i>	•									
	<i>Hakea chordophylla</i>	•	•								
	<i>Hakea lorea</i>		•								
	<i>Hakea lorea</i> subsp. <i>lorea</i>	•									
	<i>Hakea preissii</i>	•	•								
Pteridaceae	<i>Cheilanthes brownii</i>	•	•								
	<i>Cheilanthes lasiophylla</i>	•	•								
	<i>Cheilanthes sieberi</i>		•								
	<i>Cheilanthes sieberi</i> subsp. <i>pseudovellea</i>	•									
	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	•									
	<i>Cheilanthes tenuifolia</i>	•									
Rhamnaceae	<i>Cryptandra monticola</i>		•								
	<i>Ziziphus mauritiana</i>						•				Y
Rosaceae	<i>Rubus anglocandicans</i>						•				Y
	<i>Rubus laudatus</i>						•				Y
	<i>Rubus rugosus</i>						•				Y
	<i>Rubus ulmifolius</i>						•				Y
Rubiaceae	<i>Oldenlandia crouchiana</i>	•									
	<i>Psyrax latifolia</i>	•	•								
Ruppiaceae	<i>Ruppia polycarpa</i>	•	•								
Santalaceae	<i>Anthobolus leptomerioides</i>	•	•								
	<i>Santalum lanceolatum</i>	•	•								
Sapindaceae	<i>Diplopeltis stuartii</i>		•								
	<i>Diplopeltis stuartii</i> var. <i>stuartii</i>	•									
	<i>Dodonaea coriacea</i>	•	•								
	<i>Dodonaea lanceolata</i>		•								
	<i>Dodonaea pachyneura</i>	•	•								
Scrophulariaceae	<i>Eremophila canaliculata</i>	•	•								
	<i>Eremophila capricornica</i>			•				P1			
	<i>Eremophila clarkei</i>	•	•								
	<i>Eremophila cuneifolia</i>	•	•								
	<i>Eremophila exilifolia</i>	•	•								
	<i>Eremophila flaccida</i>		•								
	<i>Eremophila flaccida</i> subsp. <i>flaccida</i>	•									
	<i>Eremophila forrestii</i>		•								
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	•									
	<i>Eremophila fraseri</i>		•								
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	•									
	<i>Eremophila galeata</i>	•	•								
	<i>Eremophila incisa</i>	•	•								
	<i>Eremophila jucunda</i>		•								
	<i>Eremophila jucunda</i> subsp. <i>pulcherrima</i>	•									

Family	Taxon	Source						Conservation Code			Introduced
		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Scrophulariaceae cont.	<i>Eremophila lachnocalyx</i>	•	•								
	<i>Eremophila lanceolata</i>	•	•								
	<i>Eremophila latrobei</i>		•								
	<i>Eremophila latrobei</i> subsp. <i>latrobei</i>	•									
	<i>Eremophila longifolia</i>	•	•								
	<i>Eremophila maculata</i>		•								
	<i>Eremophila maculata</i> subsp. <i>brevifolia</i>	•									
	<i>Eremophila maculata</i> subsp. <i>maculata</i>	•									
	<i>Eremophila magnifica</i>		•								
	<i>Eremophila magnifica</i> subsp. <i>magnifica</i>	•		•				P4			
	<i>Eremophila magnifica</i> subsp. <i>velutina</i>	•		•				P3			
	<i>Eremophila margarethae</i>	•	•								
	<i>Eremophila platycalyx</i>		•								
	<i>Eremophila platycalyx</i> subsp. Neds Creek (N.H. Speck 1228)	•									
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	•									
	<i>Eremophila rhexos</i>	•	•	•				P1			
	<i>Eremophila rigida</i>	•		•				P3			
	<i>Eremophila</i> sp. Hamersley Range (K. Walker KW 136)	•		•				P3			
	<i>Eremophila</i> sp. West Angelas (S. van Leeuwen 4068)			•				P1			
	<i>Eremophila tietkensis</i>		•								
	<i>Eremophila youngii</i> subsp. <i>lepidota</i>	•		•				P4			
	<i>Myoporum montanum</i>	•	•								
Solanaceae	<i>Nicotiana benthamiana</i>	•	•								
	<i>Nicotiana occidentalis</i>		•								
	<i>Nicotiana occidentalis</i> subsp. <i>obliqua</i>	•									
	<i>Nicotiana rosulata</i>		•								
	<i>Nicotiana rosulata</i> subsp. <i>rosulata</i>	•									
	<i>Solanum centrale</i>	•	•								
	<i>Solanum cleistogamum</i>	•	•								
	<i>Solanum diversiflorum</i>		•								
	<i>Solanum elaeagnifolium</i>						•				Y
	<i>Solanum elatius</i>	•	•								
	<i>Solanum lachnophyllum</i>		•								
	<i>Solanum lasiophyllum</i>	•	•								
	<i>Solanum linnaeanum</i>						•				Y
	<i>Solanum morrisonii</i>		•								
	<i>Solanum piceum</i>		•								
	<i>Solanum sturtianum</i>		•								
	<i>Stylidium desertorum</i>		•								
Stylidiaceae	<i>Stylidium desertorum</i>		•								
Tamaricaceae	<i>Tamarix aphylla</i>						•				Y
Thymelaeaceae	<i>Pimelea forrestiana</i>	•	•								
Typhaceae	<i>Typha domingensis</i>	•	•								
Verbenaceae	<i>Lantana camara</i>						•				Y
Violaceae	<i>Afrohybanthus aurantiacus</i>	•	•								
Zygophyllaceae	<i>Roepera rowelliae</i>		•								



Family	Taxon	Source						Conservation Code			Introduced
		NM	ALA	WAH	TPFL	EPBC	WAOL	DBCA	BC Act	EPBC Act	
Zygophyllaceae cont.	<i>Roepera similis</i>		•								
	<i>Tribulus astrocarpus</i>	•	•								
	<i>Tribulus eichlerianus</i>	•									
	<i>Tribulus hirsutus</i>	•	•								
	<i>Tribulus hystrix</i>		•								
	<i>Tribulus macrocarpus</i>	•	•								
	<i>Tribulus suberosus</i>		•								
	<i>Tribulus terrestris</i>		•								Y

## Appendix I: Introduced Flora Search Results

Family	Taxon	Source				DP	WoNS	Ecological Rating	Invasiveness Rating
		NM	ALA	EPBC	WAOL				
Alismataceae	<i>Sagittaria platyphylla</i>				•	Yes	Yes	Not assessed	Not assessed
Amaranthaceae	<i>Alternanthera pungens</i>	•	•			No	No	Low	Slow
Apocynaceae	<i>Calotropis procera</i>				•	Yes	No	Not assessed	Not assessed
	<i>Cryptostegia madagascariensis</i>				•	Yes	No	Not assessed	Not assessed
Araceae	<i>Pistia stratiotes</i>				•	Yes	No	Not assessed	Not assessed
	<i>Zantedeschia aethiopica</i>				•	Yes	No	Not assessed	Not assessed
Araliaceae	<i>Hydrocotyle ranunculoides</i>				•	Yes	No	Not assessed	Not assessed
Asparagaceae	<i>Asparagus asparagoides</i>				•	Yes	Yes	Not assessed	Not assessed
Asteraceae	<i>Bidens bipinnata</i>	•	•			No	No	Unknown	Rapid
	<i>Bidens subalternans</i>		•			No	No	Not assessed	Not assessed
	<i>Bidens subalternans</i> var. <i>araneosa</i>	•				No	No	Not assessed	Not assessed
	<i>Bidens subalternans</i> var. <i>simulans</i>	•				No	No	Not assessed	Not assessed
	<i>Chondrilla juncea</i>				•	Yes	No	Not assessed	Not assessed
	<i>Erigeron bonariensis</i>		•			No	No	Not assessed	Not assessed
	<i>Erigeron</i> sp.	•				No	No	Not assessed	Not assessed
	<i>Flaveria trinervia</i>	•	•			No	No	Not assessed	Not assessed
	<i>Lactuca saligna</i>	•	•			No	No	Not assessed	Not assessed
	<i>Onopordum acaulon</i>				•	Yes	No	Not assessed	Not assessed
	<i>Silybum marianum</i>				•	Yes	No	Not assessed	Not assessed
	<i>Sonchus asper</i>		•			No	No	Not assessed	Not assessed
	<i>Sonchus oleraceus</i>	•	•			No	No	Low	Rapid
	<i>Xanthium spinosum</i>				•	Yes	No	Not assessed	Not assessed
	<i>Xanthium strumarium</i>				•	Yes	No	Not assessed	Not assessed
Boraginaceae	<i>Echium plantagineum</i>				•	Yes	No	Not assessed	Not assessed
Cactaceae	<i>Austrocylindropuntia cylindrica</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Austrocylindropuntia subulata</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Cylindropuntia fulgida</i>				•	Yes	Yes	High	Slow
	<i>Cylindropuntia imbricata</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Cylindropuntia kleiniae</i>				•	Yes	Yes	Not assessed	Not assessed



Family	Taxon	Source				DP	WoNS	Ecological Rating	Invasiveness Rating
		NM	ALA	EPBC	WAOL				
Cactaceae cont.	<i>Cylindropuntia pallida</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Cylindropuntia tunicata</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Opuntia elata</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Opuntia elatior</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Opuntia engelmannii</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Opuntia ficus-indica</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Opuntia microdasys</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Opuntia monacantha</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Opuntia polyacantha</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Opuntia puberula</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Opuntia stricta</i>				•	Yes	Yes	High	Rapid
	<i>Opuntia tomentosa</i>				•	Yes	Yes	Not assessed	Not assessed
Cucurbitaceae	<i>Citrullus amarus</i>	•	•			No	No	Not assessed	Not assessed
Cyperaceae	<i>Cyperus tenuiflorus</i>	•	•			No	No	Not assessed	Not assessed
Euphorbiaceae	<i>Jatropha gossypifolia</i>				•	Yes	Yes	Not assessed	Not assessed
Fabaceae	<i>Alhagi maurorum</i>				•	Yes	No	Not assessed	Not assessed
	<i>Desmanthus virgatus</i>	•	•			No	No	Not assessed	Not assessed
	<i>Parkinsonia aculeata</i>				•	Yes	Yes	High	Rapid
	<i>Prosopis glandulosa x velutina</i>				•	Yes	Yes	High	Rapid
	<i>Senna alata</i>				•	Yes	No	Not assessed	Not assessed
	<i>Senna obtusifolia</i>				•	Yes	No	Not assessed	Not assessed
	<i>Senna occidentalis</i>	•	•			No	No	Not assessed	Not assessed
	<i>Ulex europaeus</i>				•	Yes	Yes	Not assessed	Not assessed
Iridaceae	<i>Moraea flaccida</i>				•	Yes	No	Not assessed	Not assessed
	<i>Moraea miniata</i>				•	Yes	No	Not assessed	Not assessed
Malvaceae	<i>Malvastrum americanum</i>	•	•			No	No	High	Rapid
Poaceae	<i>Cenchrus ciliaris</i>	•	•	•		No	No	High	Rapid
	<i>Cenchrus setiger</i>	•	•			No	No	High	Rapid
	<i>Chloris virgata</i>	•	•			No	No	High	Rapid

Family	Taxon	Source				DP	WoNS	Ecological Rating	Invasiveness Rating
		NM	ALA	EPBC	WAOL				
Poaceae cont.	<i>Cynodon dactylon</i>	•	•			No	No	High	Rapid
	<i>Digitaria ciliaris</i>		•			No	No	Low	Slow
	<i>Diplachne fusca</i>		•			No	No	Not assessed	Not assessed
	<i>Echinochloa colona</i>	•	•			No	No	High	Rapid
	<i>Setaria verticillata</i>	•	•			No	No	High	Rapid
Polygonaceae	<i>Rumex vesicarius</i>	•	•			No	No	Not assessed	Not assessed
Rhamnaceae	<i>Ziziphus mauritiana</i>				•	Yes	No	Not assessed	Not assessed
Rosaceae	<i>Rubus anglocandicans</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Rubus laudatus</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Rubus rugosus</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Rubus ulmifolius</i>				•	Yes	Yes	Not assessed	Not assessed
Solanaceae	<i>Solanum elaeagnifolium</i>				•	Yes	Yes	Not assessed	Not assessed
	<i>Solanum linnaeanum</i>				•	Yes	No	Not assessed	Not assessed
Tamaricaceae	<i>Tamarix aphylla</i>				•	Yes	Yes	High	Rapid
Verbenaceae	<i>Lantana camara</i>				•	Yes	Yes	Not assessed	Not assessed
Zygophyllaceae	<i>Tribulus terrestris</i>		•			No	No	Unknown	Moderate

## Appendix J: Flora Composition



Family	Taxon	Survey Area	
		Pipelines	Paddy Bore
Acanthaceae	<i>Dicladanthera forrestii</i>	✓	
	<i>Dipteracanthus australasicus</i> subsp. <i>australasicus</i>	✓	✓
Aizoaceae	<i>Trianthema triquetrum</i>	✓	
Amaranthaceae	* <i>Aerva javanica</i>	✓	
	<i>Alternanthera angustifolia</i>	✓	
	<i>Alternanthera denticulata</i>	✓	
	<i>Alternanthera nana</i>	✓	
	<i>Gomphrena canescens</i>	✓	✓
	<i>Ptilotus astrolasius</i>	✓	✓
	<i>Ptilotus calostachyus</i>	✓	✓
	<i>Ptilotus clementii</i>	✓	✓
	<i>Ptilotus exaltatus</i>	✓	✓
	<i>Ptilotus gaudichaudii</i>	✓	
	<i>Ptilotus gomphrenoides</i>	✓	
	<i>Ptilotus helipteroides</i>	✓	✓
	<i>Ptilotus obovatus</i> var. <i>obovatus</i>	✓	✓
	<i>Ptilotus polystachyus</i>	✓	✓
	<i>Ptilotus roei</i>	✓	
	<i>Ptilotus rotundifolius</i>	✓	✓
	<i>Ptilotus schwartzii</i> var. <i>schwartzii</i>	✓	
Apocynaceae	<i>Vincetoxicum flexuosum</i>	✓	
	<i>Vincetoxicum lineare</i>	✓	
Asteraceae	* <i>Bidens bipinnata</i>	✓	✓
	<i>Centipeda minima</i> subsp. <i>macrocephala</i>	✓	
	<i>Chrysocephalum apiculatum</i> subsp. <i>pilbarens</i>	✓	
	<i>Chrysocephalum gilesii</i>	✓	
	<i>Peripleura arida</i>		✓
	<i>Pluchea ferdinandi-muelleri</i>	✓	
	<i>Pterocaulon sphacelatum</i>	✓	✓
Boraginaceae	<i>Heliotropium heteranthum</i>	✓	
	<i>Heliotropium ovalifolium</i>		✓
	<i>Heliotropium tanythrix</i>	✓	
	<i>Heliotropium tenuifolium</i>	✓	✓
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	✓	✓
Brassicaceae	<i>Lepidium platypetalum</i>	✓	
Caryophyllaceae	<i>Polycarpaea corymbosa</i>	✓	
Chenopodiaceae	Chenopodiaceae sp. indet	✓	
	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	✓	
	<i>Maireana</i> sp. indet	✓	
	<i>Maireana georgei</i>		✓
	<i>Maireana melanocoma</i>	✓	✓
	<i>Maireana pyramidata</i>	✓	
	<i>Maireana tomentosa</i>	✓	
	<i>Maireana triptera</i>	✓	
	<i>Maireana villosa</i>	✓	

Family	Taxon	Survey Area	
		Pipelines	Paddy Bore
Chenopodiaceae cont.	<i>Rhagodia eremaea</i>	✓	✓
	<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794) (P3)	✓	
	<i>Salsola australis</i>	✓	
	<i>Sclerolaena bicornis</i>	✓	
	<i>Sclerolaena cornishiana</i>	✓	
	<i>Sclerolaena cuneata</i>	✓	
	<i>Sclerolaena diacantha</i>	✓	
	<i>Sclerolaena eriacantha</i>	✓	
	<i>Sclerolaena ?eriacantha</i>	✓	
	<i>Sclerolaena lanicuspis</i>	✓	
	<i>Tecticornia</i> sp. indet	✓	
Cleomaceae	<i>Arivela viscosa</i>	✓	✓
Convolvulaceae	<i>Bonamia pilbarensis</i>		✓
	<i>Duperreya commixta</i>	✓	✓
	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	✓	✓
	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	✓	✓
	<i>Ipomoea calobra</i>	✓	
	<i>Ipomoea muelleri</i>	✓	
	<i>Operculina aequiseipala</i>	✓	
Cucurbitaceae	* <i>Citrullus amarus</i>	✓	
	<i>Cucumis melo</i>	✓	
	<i>Cucumis variabilis</i>	✓	✓
Cyperaceae	<i>Bulbostylis barbata</i>	✓	
	<i>Cyperus difformis</i>	✓	
	<i>Cyperus vaginatus</i>	✓	
	<i>Eleocharis pallens</i>	✓	
	<i>Fimbristylis dichotoma</i>	✓	
	<i>Fimbristylis simulans</i>		✓
	<i>Schoenoplectiella dissachantha</i>	✓	
Euphorbiaceae	<i>Adriana tomentosa</i>		
	<i>Euphorbia australis</i> var. <i>subtomentosa</i>		✓
	<i>Euphorbia biconvexa</i>	✓	✓
	<i>Euphorbia boophthona</i>	✓	✓
Fabaceae	<i>Acacia ?adsurgens</i>	✓	
	<i>Acacia adsurgens</i>	✓	✓
	<i>Acacia ancistrocarpa</i>	✓	
	<i>Acacia aptaneura</i>	✓	✓
	<i>Acacia ayersiana</i>	✓	
	<i>Acacia bivenosa</i>	✓	✓
	<i>Acacia catenulata</i> subsp. <i>occidentalis</i>	✓	
	<i>Acacia citrinoviridis</i>	✓	
	<i>Acacia colei</i> var. <i>colei</i>	✓	
	<i>Acacia coriacea</i> subsp. <i>pendens</i>	✓	
	<i>Acacia dictyophleba</i>	✓	✓
	<i>Acacia hilliana</i>	✓	

Family	Taxon	Survey Area	
		Pipelines	Paddy Bore
Fabaceae cont.	<i>Acacia inaequilatera</i>	✓	✓
	<i>Acacia incurvaneura</i>	✓	
	<i>Acacia macraneura</i>	✓	
	<i>Acacia maitlandii</i>	✓	✓
	<i>Acacia pachyacra</i>	✓	✓
	<i>Acacia paraneura</i>	✓	
	<i>Acacia pruinocarpa</i>	✓	✓
	<i>Acacia pteraneura</i>	✓	
	<i>Acacia pyrifolia</i>	✓	
	<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>		✓
	<i>Acacia rhodophloia</i>	✓	
	<i>Acacia rhodophloia</i> x <i>sibirica</i>	✓	
	<i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i>	✓	✓
	<i>Acacia sibirica</i>	✓	✓
	<i>Acacia subcontorta</i>	✓	
	<i>Acacia synchronicia</i>	✓	✓
	<i>Acacia tetragonophylla</i>	✓	✓
	<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	✓	
	<i>Indigofera georgei</i>	✓	
	<i>Indigofera linifolia</i>	✓	✓
	<i>Indigofera monophylla</i>	✓	✓
	<i>Isotropis iophyta</i>	✓	
	<i>Kennedia prorepens</i>	✓	✓
	<i>Neptunia dimorphantha</i>	✓	
	<i>Neptunia gracilis</i> forma <i>gracilis</i>	✓	
	<i>Petalostylis labicheoides</i>	✓	✓
	<i>Rhynchosia minima</i>	✓	✓
	<i>Senna artemisioides</i> subsp. <i>filifolia</i>	✓	
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	✓	✓
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	✓	✓
	<i>Senna artemisioides</i> subsp. <i>oligophylla</i> x hybrid	✓	
	<i>Senna artemisioides</i> subsp. x <i>artemisioides</i>	✓	✓
	<i>Senna glaucifolia</i>	✓	
	<i>Senna glutinosa</i>	✓	
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>		✓
	<i>Senna glutinosa</i> subsp. <i>pruinosa</i>	✓	✓
	<i>Senna glutinosa</i> subsp. x <i>luerssenii</i>	✓	✓
	<i>Senna hamersleyensis</i>	✓	
	<i>Senna notabilis</i>	✓	✓
	<i>Senna</i> sp. Meekatharra (E. Bailey 1-26)	✓	
	<i>Senna symonii</i>	✓	
	<i>Sesbania cannabina</i>	✓	
	<i>Tephrosia rosea</i> var. Fortescue creeks (M.I.H. Brooker 2186)	✓	
	<i>Tephrosia</i> sp. clay soils (S. van Leeuwen et al. PBS 0273)		✓



Family	Taxon	Survey Area	
		Pipelines	Paddy Bore
Fabaceae cont.	<i>Tephrosia</i> sp. Newman (A.A. Mitchell PRP 29)	✓	✓
	* <i>Vachellia farnesiana</i>	✓	
	<i>Vigna lanceolata</i>		✓
Frankeniaceae	<i>Frankenia</i> sp. indet	✓	
Goodeniaceae	<i>Dampiera candidans</i>	✓	
	<i>Goodenia cusackiana</i>	✓	
	<i>Goodenia lamprosperma</i>	✓	
	<i>Goodenia microptera</i>	✓	✓
	<i>Goodenia muelleriana</i>	✓	✓
	<i>Goodenia stobbsiana</i>	✓	
	<i>Goodenia triodiophila</i>	✓	
	<i>Goodenia vilmoriniae</i>	✓	✓
	<i>Scaevola amblyanthera</i> var. <i>amblyanthera</i>	✓	
	<i>Scaevola amblyanthera</i> var. <i>centralis</i>	✓	✓
	<i>Scaevola spinescens</i>	✓	
Gyrostemonaceae	<i>Codonocarpus cotinifolius</i>	✓	✓
Loranthaceae	<i>Amyema fitzgeraldii</i>	✓	
	<i>Amyema gibberula</i> var. <i>gibberula</i>	✓	
Malvaceae	<i>Abutilon amplum</i>	✓	
	<i>Abutilon cryptopetalum</i>	✓	✓
	<i>Abutilon cunninghamii</i>	✓	✓
	<i>Abutilon fraseri</i> subsp. <i>fraseri</i>	✓	
	<i>Abutilon lepidum</i>	✓	✓
	<i>Abutilon macrum</i>	✓	✓
	<i>Abutilon otocarpum</i>	✓	✓
	<i>Abutilon oxycarpum</i>	✓	
	<i>Abutilon</i> sp. indet	✓	
	<i>Abutilon</i> sp. Pilbara (W.R. Barker 2025)		✓
	<i>Androcalva loxophylla</i>	✓	
	<i>Androcalva luteiflora</i>	✓	
	<i>Corchorus incanus</i> subsp. <i>lithophilus</i>	✓	✓
	<i>Corchorus laniflorus</i>	✓	
	<i>Corchorus lasiocarpus</i> subsp. <i>parvus</i>	✓	✓
	<i>Corchorus parviflorus</i>	✓	
	<i>Corchorus</i> sp. indet		✓
	<i>Corchorus tridens</i>	✓	✓
	<i>Gossypium robinsonii</i>	✓	
	<i>Hibiscus burtonii</i>	✓	✓
	<i>Hibiscus coatesii</i>	✓	✓
	<i>Hibiscus sturtii</i> var. <i>campylochlamys</i>	✓	✓
	<i>Hibiscus sturtii</i> var. <i>platychlamys</i>	✓	
	* <i>Malvastrum americanum</i>	✓	✓
	<i>Melhania oblongifolia</i>	✓	
	<i>Seringia exastia</i> (T)	✓	
	<i>Sida ectogama</i>	✓	

Family	Taxon	Survey Area	
		Pipelines	Paddy Bore
Malvaceae cont.	<i>Sida fibulifera</i>	✓	✓
	<i>Sida platycalyx</i>	✓	
	<i>Sida</i> sp. dark green fruits (S. van Leeuwen 2260)	✓	
	<i>Sida</i> sp. indet		✓
	<i>Sida</i> sp. ?spiciform panicles (E. Leyland s.n. 14/8/90)	✓	
	<i>Triumfetta clementii</i>	✓	
Marsileaceae	<i>Marsilea drummondii</i>	✓	
	<i>Marsilea hirsuta</i>	✓	
Molluginaceae	<i>Glinus lotoides</i>	✓	
Montiaceae	<i>Calandrinia schistorhiza</i>	✓	
Myrtaceae	<i>Corymbia candida</i>	✓	
	<i>Corymbia candida</i> subsp. <i>dipsodes</i>	✓	
	<i>Corymbia hamersleyana</i>	✓	✓
	<i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>	✓	
	<i>Eucalyptus gamophylla</i>	✓	✓
	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	✓	✓
	<i>Eucalyptus socialis</i> subsp. <i>eucentrica</i>	✓	
	<i>Eucalyptus trivalva</i>	✓	
	<i>Eucalyptus victrix</i>	✓	
	<i>Eucalyptus xerothermica</i>	✓	✓
	<i>Melaleuca eleuterostachya</i>	✓	
	<i>Melaleuca glomerata</i>	✓	
Nyctaginaceae	<i>Boerhavia coccinea</i>	✓	✓
	<i>Boerhavia</i> sp. indet	✓	
Oleaceae	<i>Jasminum didymum</i> subsp. <i>lineare</i>	✓	
Phyllanthaceae	<i>Phyllanthus maderaspatensis</i>	✓	
Plantaginaceae	<i>Stemodia viscosa</i>	✓	
Poaceae	<i>Acrachne racemosa</i>		✓
	<i>Amphipogon sericeus</i>	✓	
	<i>Aristida contorta</i>	✓	✓
	<i>Aristida holathera</i> var. <i>holathera</i>	✓	✓
	<i>Aristida inaequiglumis</i>	✓	✓
	<i>Aristida obscura</i>	✓	
	<i>Astrebla elymoides</i>	✓	
	<i>Astrebla pectinata</i>	✓	
	* <i>Cenchrus ciliaris</i>	✓	✓
	* <i>Cenchrus setiger</i>	✓	✓
	<i>Chloris pumilio</i>	✓	
	<i>Chloris</i> sp. indet	✓	
	<i>Chrysopogon fallax</i>	✓	✓
	<i>Cymbopogon ambiguus</i>	✓	✓
	<i>Cynodon convergens</i>	✓	✓
	* <i>Cynodon dactylon</i>	✓	
	<i>Cynodon prostratus</i>	✓	
	<i>Dactyloctenium radulans</i>	✓	✓

Family	Taxon	Survey Area	
		Pipelines	Paddy Bore
Poaceae cont.	<i>Dichanthium sericeum</i> subsp. <i>humilius</i>	✓	✓
	<i>Digitaria brownii</i>	✓	✓
	<i>Digitaria ctenantha</i>	✓	✓
	* <i>Echinochloa colona</i>	✓	
	<i>Enneapogon caeruleus</i>	✓	
	<i>Enneapogon polyphyllus</i>	✓	✓
	<i>Enteropogon ramosus</i>	✓	✓
	<i>Eragrostis elongata</i>	✓	
	<i>Eragrostis eriopoda</i>	✓	
	<i>Eragrostis falcata</i>	✓	
	<i>Eragrostis tenellula</i>	✓	
	<i>Eragrostis xerophila</i>	✓	✓
	<i>Eriachne aristidea</i>	✓	
	<i>Eriachne ciliata</i>	✓	
	<i>Eriachne flaccida</i>	✓	
	<i>Eriachne lanata</i>	✓	
	<i>Eriachne mucronata</i>	✓	✓
	<i>Eriachne pulchella</i>	✓	✓
	<i>Eriachne pulchella</i> subsp. <i>pulchella</i>	✓	✓
	<i>Eulalia aurea</i>	✓	✓
	<i>Iseilema eremaeum</i>	✓	
	<i>Iseilema membranaceum</i>	✓	✓
	<i>Leptochloa digitata</i>	✓	
	<i>Monachather paradoxus</i>	✓	
	<i>Oxychloris scariosa</i>	✓	
	<i>Panicum decompositum</i>	✓	✓
	<i>Paraneurachne muelleri</i>	✓	✓
	<i>Paspalidium clementii</i>	✓	
	<i>Paspalidium constrictum</i>	✓	✓
	<i>Perotis rara</i>	✓	✓
	* <i>Setaria verticillata</i>	✓	
	<i>Sporobolus actinocladius</i>	✓	
	<i>Sporobolus australasicus</i>	✓	✓
	<i>Themeda triandra</i>	✓	✓
	<i>Thyridolepis mitchelliana</i>	✓	
	<i>Tragus australianus</i>	✓	
	<i>Triodia angusta</i>	✓	✓
	<i>Triodia longiceps</i>	✓	
	<i>Triodia pungens</i>	✓	✓
	<i>Triodia vanleeuwenii</i>	✓	✓
	<i>Triodia wiseana</i>	✓	✓
Portulacaceae	<i>Portulaca cyclophylla</i>	✓	
	<i>Portulaca filifolia</i>	✓	✓
	<i>Portulaca oleracea</i>	✓	✓
	* <i>Portulaca pilosa</i>	✓	



Family	Taxon	Survey Area	
		Pipelines	Paddy Bore
Proteaceae	<i>Grevillea berryana</i>	✓	
	<i>Grevillea striata</i>	✓	
	<i>Hakea chordophylla</i>	✓	✓
	<i>Hakea leucoptera</i> subsp. <i>sericipes</i>	✓	
	<i>Hakea lorea</i> subsp. <i>lorea</i>	✓	✓
	<i>Hakea preissii</i>	✓	
Pteridaceae	<i>Cheilanthes sieberi</i>	✓	
Rubiaceae	<i>Dolichocarpa crouchiana</i>		✓
	<i>Psychdrax latifolia</i>		✓
	<i>Psychdrax rigidula</i>	✓	
	<i>Psychdrax suaveolens</i>	✓	
Santalaceae	<i>Anthobolus leptomerioides</i>	✓	✓
	<i>Santalum acuminatum</i>	✓	
	<i>Santalum lanceolatum</i>	✓	✓
Sapindaceae	<i>Dodonaea petiolaris</i>		✓
Scrophulariaceae	<i>Eremophila ?forrestii</i>	✓	
	<i>Eremophila ?margarethae</i>	✓	
	<i>Eremophila ?platycalyx</i>	✓	
	<i>Eremophila cuneifolia</i>	✓	✓
	<i>Eremophila forrestii</i> subsp. <i>forrestii</i>	✓	
	<i>Eremophila fraseri</i> subsp. <i>fraseri</i>	✓	✓
	<i>Eremophila lachnocalyx</i>	✓	
	<i>Eremophila latrobei</i>	✓	
	<i>Eremophila latrobei</i> subsp. <i>filiformis</i>	✓	
	<i>Eremophila latrobei</i> subsp. <i>latrobei</i>	✓	✓
	<i>Eremophila longifolia</i>	✓	✓
	<i>Eremophila maculata</i> subsp. <i>brevifolia</i>	✓	
	<i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>	✓	
	<i>Eremophila platycalyx</i> subsp. <i>pardalota</i>	✓	✓
Solanaceae	<i>Solanum cleistogamum</i>	✓	✓
	<i>Solanum lasiophyllum</i>	✓	✓
	<i>Solanum ?lasiophyllum</i>	✓	
Surianaceae	<i>Stylobasium spathulatum</i>	✓	
Violaceae	<i>Afrohybanthus aurantiacus</i>	✓	
Zygophyllaceae	<i>Tribulopsis angustifolia</i>		✓
	<i>Tribulus astrocarpus</i>	✓	
	<i>Tribulus hirsutus</i>	✓	✓
	<i>Tribulus platypterus</i>	✓	
	<i>Tribulus suberosus</i>	✓	✓

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