

## **COOLJARLOO EXPLORATION AREA EXPLORATION ENVIRONMENTAL ASSESSMENT 2022**

Desktop Review and Risk Assessment, Field  
Survey and Impact Assessment

**FINAL**

March 2022

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Desktop Review and Risk Assessment, Field Survey  
and Impact Assessment

**FINAL**

Prepared by  
**Umwelt (Australia) Pty Limited**  
on behalf of  
**Tronox Holdings plc**

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# Executive Summary

Tronox Management Pty Ltd (Tronox) has conducted mineral sands exploration activities in the Swan Coastal Plain sub-region and Northern Sandplains region of Western Australia (W.A.) since 2000. This includes the Cooljarloo Exploration Area (CEA), which incorporates numerous tenements located from south of Cataby in the south to near Jurien in the north. Areas within the CEA that Tronox is proposing to explore during 2021 that have not been previously assessed are at Cooljarloo West (CLW) and Cooljarloo North West (CNW)/Jurien (Figure 1) (2022 exploration drilling program).

The Tronox Exploration Environmental Management Plan (EMP) (Tronox 2019) outlines the controls Tronox employ to manage the environmental impacts associated with exploration. The EMP requires an assessment of the potential impacts of the 2022 exploration drilling program to significant flora and vegetation communities and other matters of environmental significance, to identify how such impacts may be avoided or minimised during exploration. The assessment involves:

- Desktop review and risk assessment, to determine if field survey of proposed exploration drill lines and access tracks is required, and the appropriate approach to such a survey, accounting for significant flora, vegetation communities, and other matters of environmental significance
- Field survey in areas where it is required
- Application of the impact mitigation hierarchy and assessment of potential impacts of the proposed exploration.

To this purpose, Tronox commissioned Umwelt Australia (Umwelt) to undertake an assessment of the potential impacts of the 2022 exploration drilling program, including the initial desktop review component of the works, and the subsequent field survey and impact assessment component.

A total of 0.3 km of proposed access tracks and 3.7 km of proposed drill lines (total distance 4 km) were identified as requiring survey at CLW, primarily because of the potential presence of a number of significant flora taxa, including taxa listed as Threatened. A total of 0.6 km of proposed access tracks and 3.2 km of proposed drill lines (total distance 3.8 km) were identified as requiring survey at CNW/Jurien, because of the potential presence of significant vegetation communities.

Field surveys at CLW was conducted from 27 - 29 October 2021 and 28 October 2021 at CNW/Jurien. The timing of all field surveys was chosen following the completion of the desktop review component, and in line with the results of the review, particularly regarding the flowering times for the majority of the significant flora taxa.

A total of 11 significant flora taxa (all Priority flora taxa) were recorded during the field survey of the 2022 exploration drilling program at CLW and two significant flora taxa were recorded during the field survey at CNW/Jurien (both Priority flora taxa). No Threatened flora taxa were recorded during the field survey.

*Poranthera asybosca* (P1) was recorded opportunistically for the first time at CLW in 2021 (two locations and 60 individuals). This taxon is known from very few regional records, and therefore the populations at Cooljarloo are considered significant. However, it is possible that this taxon is more common and widespread in the CLW Study Area. No flagging or deviations were established to avoid the locations of

plants as it was not a target taxon during this survey. It is unlikely that this taxon will be significantly impacted by the proposed drilling, given it is annual taxon which is expected to occur in areas adjacent to drill lines. It is possible that this species may establish in greater numbers on recently cleared drill lines compared to adjacent undisturbed vegetation, as its life history implies preference for open clearings where light availability is enhanced.

The 2021 field survey was undertaken outside of the prescribed time for identifying *Caladenia denticulata* subsp. *albicans* (P1) and *Thelymitra pulcherrima* (P2). Numerous drill lines of the 2022 exploration drilling program (CLW) transect the known preferred habitat of *Thelymitra pulcherrima* (VT 1), and the potential preferred habitat of *Caladenia denticulata* subsp. *albicans* (VT 17). Both taxa are summer-dormant tuberous species; provided that the proposed drilling occurs outside of the period when plants will be present, any plants potentially occurring in areas to be impacted are less likely to be affected by drilling activities. This action also complies with Tronox's commitment to avoid wet areas/wet soil conditions.

The 'Banksia Woodlands of the Swan Coastal Plain' Threatened Ecological Community (TEC) was recorded at CLW and CNW/Jurien, and will be impacted by the 2022 exploration drilling program. A total of 1 ha will be impacted. It is considered that none of the Significant Impact Criteria for an endangered ecological community listed under the EPBC Act (Commonwealth of Australia 2013) are met in the context of the 2022 exploration drilling program. The impact on the 'Banksia Woodlands of the Swan Coastal Plain' TEC from the 2022 exploration drilling program is therefore not considered a significant impact under the EPBC Act; referral to the Commonwealth Minister for the Environment is therefore not considered to be required.

# Table of Contents

<b>Executive Summary</b>	<b>4</b>
<b>1.0 Introduction</b>	<b>1</b>
1.1 Background	1
1.2 Objectives	3
1.3 2022 Exploration Drilling Program Description	3
<b>2.0 Background</b>	<b>5</b>
2.1 Climate	5
2.2 Flora	6
2.3 Vegetation	6
<b>3.0 Methods</b>	<b>9</b>
3.1 Desktop Review	9
3.1.1 Review of Environmental Values of 2022 Exploration Drilling Program	9
3.1.2 Determination of Survey Requirements for 2022 Exploration Drilling Program	10
3.2 Field Survey	12
3.2.1 Survey Timing, Personnel and Licensing	12
3.2.2 Survey Parameters	13
3.2.3 General Survey Approach	15
3.2.4 Flagging	15
3.2.5 Plant Identification and Collection	16
3.2.6 Limitations of Survey	16
3.3 Impact Assessment	17
3.3.1 Significant Flora	17
3.3.2 Significant Vegetation and Wetlands	18
<b>4.0 Results</b>	<b>20</b>
4.1 Desktop Reveiw	20
4.1.1 Cooljarloo West	20
4.1.2 Cooljarloo North West/Jurien	57
4.2 Field Survey	77
4.2.1 Cooljarloo West	77
4.2.2 Cooljarloo North West/Jurien	91
4.3 Impact Assessment	106
4.3.1 Cooljarloo West	106

4.3.2	Cooljarloo North West/Jurien	108
4.3.3	Impact on 'Banksia Woodlands of the Swan Coastal Plain' TEC	109
<b>5.0</b>	<b>Discussion and Conclusions</b>	<b>111</b>
<b>6.0</b>	<b>References</b>	<b>112</b>

## Figures

Figure 1-1:	Location of Cooljarloo Exploration Area and 2022 Exploration Drilling Program	2
Figure 2-1:	Mean 2021 and Long-Term Monthly Maximum and Long-Term Monthly Minimum Temperatures (°C), and 2021 and Mean Long-Term Monthly Precipitation (mm), for Jurien Bay (Bureau of Meteorology 2021)	5
Figure 2-2:	Vegetation System Associations of the Cooljarloo Exploration Area	8
Figure 4-1:	2022 Exploration Drilling Program – Cooljarloo West – Drill Line and Access Track Survey Requirements	54
Figure 4-2:	2022 Exploration Drilling Program – CNW/Jurien – Drill Line and Access Track Survey Requirements	74
Figure 4-3:	2022 Exploration Drilling Program – Cooljarloo West – 2021 Survey Results	86
Figure 4-4:	2022 Exploration Drilling Program – CNW/Jurien – 2021 Survey Results	100

## Tables

Table 1-1:	2022 Exploration Drilling Program Breakdown	3
Table 2-1:	Vegetation System Associations Intersected by the 2022 Exploration Drilling Program	6
Table 3-1:	Significance of Local Populations to the Overall/Regional Conservation of Taxa	11
Table 3-2:	Personnel and Licensing Information	12
Table 3-3:	Scale of Local Level of Impact on Significant Flora Taxa	18
Table 3-4:	Matrix Determining Regional Significance of Impact on Significant Flora Taxa	18
Table 3-5:	Scale of Local Level of Impact on Significant Vegetation	19
Table 4-1:	Survey Requirements for Significant Flora Taxa – Cooljarloo West	22
Table 4-2:	Cooljarloo West Drill Line and Proposed Access Survey Requirements	52
Table 4-3:	Survey Requirements for Significant Flora Taxa –Cooljarloo North West/Jurien	58
Table 4-4:	Cooljarloo North West/Jurien Drill Line and Proposed Access Survey Requirements	73
Table 4-5:	Significant Flora Taxa Recorded by the Field Survey at Cooljarloo West	77
Table 4-6:	Cooljarloo West Drill Line and Access Track Survey Outcomes	81
Table 4-7:	Significant Flora Taxa Recorded by the Field Survey at Cooljarloo North West/Jurien	91
Table 4-8:	Cooljarloo North West/Jurien Drill Line and Access Track Survey Outcomes	98

Table 4-9:	Impact (3m Clearing Width) on Preferred Habitat of Significant Flora that Require Survey and Impact Assessment, Cooljarloo West	107
Table 4-10:	Local Impact on Significant Vegetation Types (3m Clearing Width)	107
Table 4-11:	Impact on 'Banksia Woodlands of the Swan Coastal Plain' TEC (3 m Clearing Width)	109

## Plates

Plate 4-1:	CNW/Jurien Community 1	92
Plate 4-2:	CNW/Jurien Community 2	93
Plate 4-3:	CNW/Jurien Community 3	93
Plate 4-4:	CNW/Jurien Community 5	94
Plate 4-5:	CNW/Jurien Community 10	94
Plate 4-6:	CNW/Jurien Community 11	95
Plate 4-7:	CNW/Jurien Community 12	95
Plate 4-8:	CNW/Jurien Community 13	96
Plate 4-9:	CNW/Jurien Community 14	96

## Appendices

Appendix A	EPBC Act Protected Matters Reports for Cooljarloo West and Cooljarloo North West/Jurien (DAWE 2021a, b)
Appendix B	Descriptions of Vegetation Types Intersected by the 2022 Exploration Drilling Program (as per Woodman Environmental 2014a)
Appendix C	Point Locations of Significant Flora Taxa Recorded by the 2021 Survey
Appendix D	Threatened and Priority Flora Report Forms for Taxa Recorded by the 2021 Survey



# 1.0 Introduction

## 1.1 Background

Tronox Holdings plc (Tronox) conducts exploration for mineral sands on the Swan Coastal Plain sub-region and Northern Sandplains region of Western Australia (W.A.). Exploration within the Cooljarloo Exploration Area (CEA) incorporates numerous tenements located from south of Cataby in the south to near Jurien in the north.

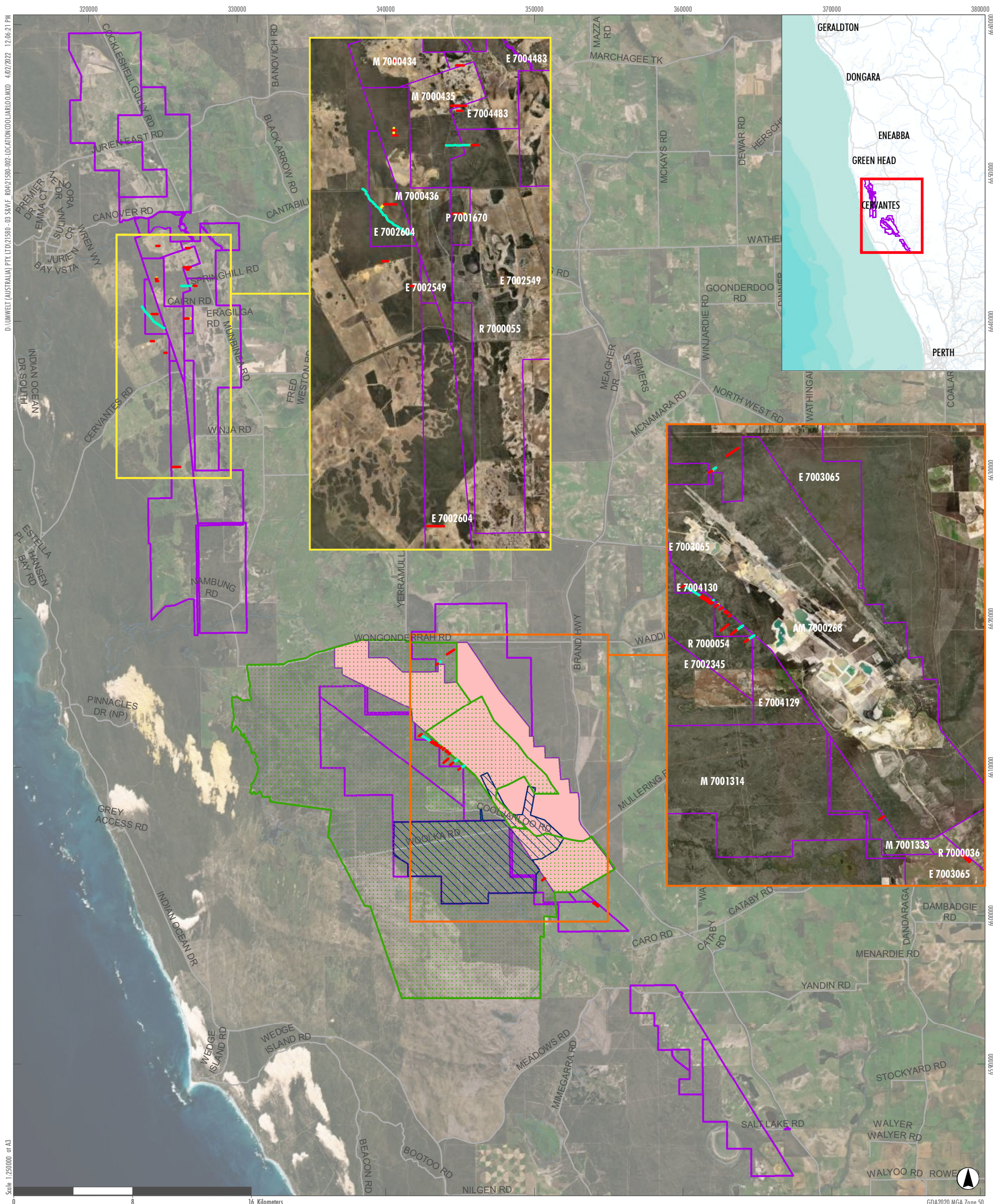
Tronox collect information required to identify, assess and manage potential environmental impacts associated with exploration. Numerous flora and vegetation surveys and impact assessments have been undertaken over several years, by a number of independent consultancies to inform both drilling and mining activities. A relatively high number of significant flora taxa (including both Threatened and Department of Biodiversity, Conservation and Attractions (DBCA)-classified Priority flora taxa) are known to occur in the CEA.

Tronox is proposing to continue exploration in three individual exploration areas within the CEA in 2022 ('2022 exploration drilling program'), namely Cooljarloo West (CLW), Cooljarloo North West (CNW) and Jurien (Jurien) (**Figure 1-1**). Because of the proximity to each other, the CNW and Jurien areas are discussed collectively (CNW/Jurien).

The Tronox Exploration Environmental Management Plan (EMP) (Tronox 2019) outlines the controls Tronox employ to manage the environmental impacts associated with exploration. The EMP requires an assessment of the potential impacts of the 2022 exploration drilling program on significant flora and vegetation communities and other matters of environmental significance, to identify how such impacts may be avoided or minimised during exploration. The assessment involves:

- Desktop review and risk assessment, to determine if field survey of proposed exploration drill lines and access tracks is required, and the appropriate approach to such a survey, accounting for significant flora, vegetation communities, and other matters of environmental significance
- Field survey in areas where it is required
- Application of the impact mitigation hierarchy and assessment of potential impacts of the proposed exploration.

To this purpose, Tronox commissioned Umwelt Australia (Umwelt) (previously Woodman Environmental Consulting) Pty Ltd (Woodman Environmental)) to undertake an assessment of the potential impacts of the 2022 exploration drilling program. This report presents desktop review, results of field survey and impact assessment for works proposed at CLW and CNW/Jurien areas.



- Legend**
- 2022 Exploration Drilling Program - Drill Line
  - 2022 Exploration Drilling Program - Existing Access
  - 2022 Exploration Drilling Program - Proposed Access
  - ▨ Cooljarloo West Study Area
  - ▨ Cooljarloo Mine Lease
  - ▨ Cooljarloo West Development Envelope
  - ▭ Tronox and Yalgoo Minerals Tenements (Cooljarloo Exploration Area)
  - Rivers
  - Roads

FIGURE 1.1

Location of Cooljarloo Exploration Area and 2022 Exploration Drilling Program

The above works are required to be undertaken in accordance with Tronox’s established methods for risk assessment and associated survey outlined in the EMP (Tronox 2019). These methods have been agreed with DBCA and the Department of Mines, Industry Regulation and Safety (DMIRS). The above works are also required to be undertaken in line with the Environmental Protection Authority’s (EPA) Environmental Factor Guideline – Flora and Vegetation (EPA 2016a), and the EPA’s Technical Guide – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016b), with specific regard to the Targeted Survey guidance.

## 1.2 Objectives

The overarching objective of this assessment is to inform the application of the mitigation hierarchy to avoid and minimise impacts during exploration by Tronox in the CEA.

The specific objectives of the desktop review and risk assessment include:

- To identify any significant factors or impacts that may change the approach to the drilling program
- To identify potential impacts on significant flora taxa, significant vegetation communities or other significant environmental matters
- To assess the proposed program and identify drill lines and access tracks, or parts thereof, that will require field survey (for example, where potential habitat for significant flora taxa or wetlands may be intersected).

The specific objectives of the field survey and impact assessment include:

- To identify significant flora, vegetation, wetlands and fauna habitat on or within the vicinity of the drill lines and access tracks
- To determine the potential impacts on flora and vegetation values from the 2022 exploration drilling program
- To provide recommendations on the appropriate management or modifications to the drill lines and access tracks, in order to minimise impacts
- To provide documentation to enable the assessment of the 2022 exploration drilling program under the relevant legislation.

## 1.3 2022 Exploration Drilling Program Description

The breakdown of proposed drill lines and access tracks is shown in **Table 1-1**. As mentioned in **Section 1.1**, the 2022 exploration drilling program will occur in two areas within the CEA, being CLW and CNW/Jurien.

**Table 1-1: 2022 Exploration Drilling Program Breakdown**

Exploration Area	Length of Proposed Drill Lines (km)	Length of Proposed Access Tracks (km)	Total (km)
CLW	3.7	0.3	4.0
CNW/Jurien	3.2	0.6	3.8
<b>Total</b>	<b>6.9</b>	<b>0.9</b>	<b>7.8</b>

Note: Lengths have been rounded for presentation purposes

The proposed lines and access tracks constitute low-impact exploration, as they are generally widely-spaced (> 100m apart).

The EMP (Tronox 2019) outlines the approach Tronox employ to minimise clearing and general ground disturbance during exploration. Of these, of key importance are the following practices to enable machine access:

- Avoiding clearing by machinery driving over vegetation where this can be achieved safely (heath areas and open woodland where trees can be avoided)
- Where clearing is required (i.e. in areas of dense thicket or woodland), clearing approximately 3m width via loader with a raised blade/bucket avoiding disturbance of topsoil.

Impacts on vegetation are expected to be temporary, with vegetation expected to recover with time to a state similar to intact vegetation.

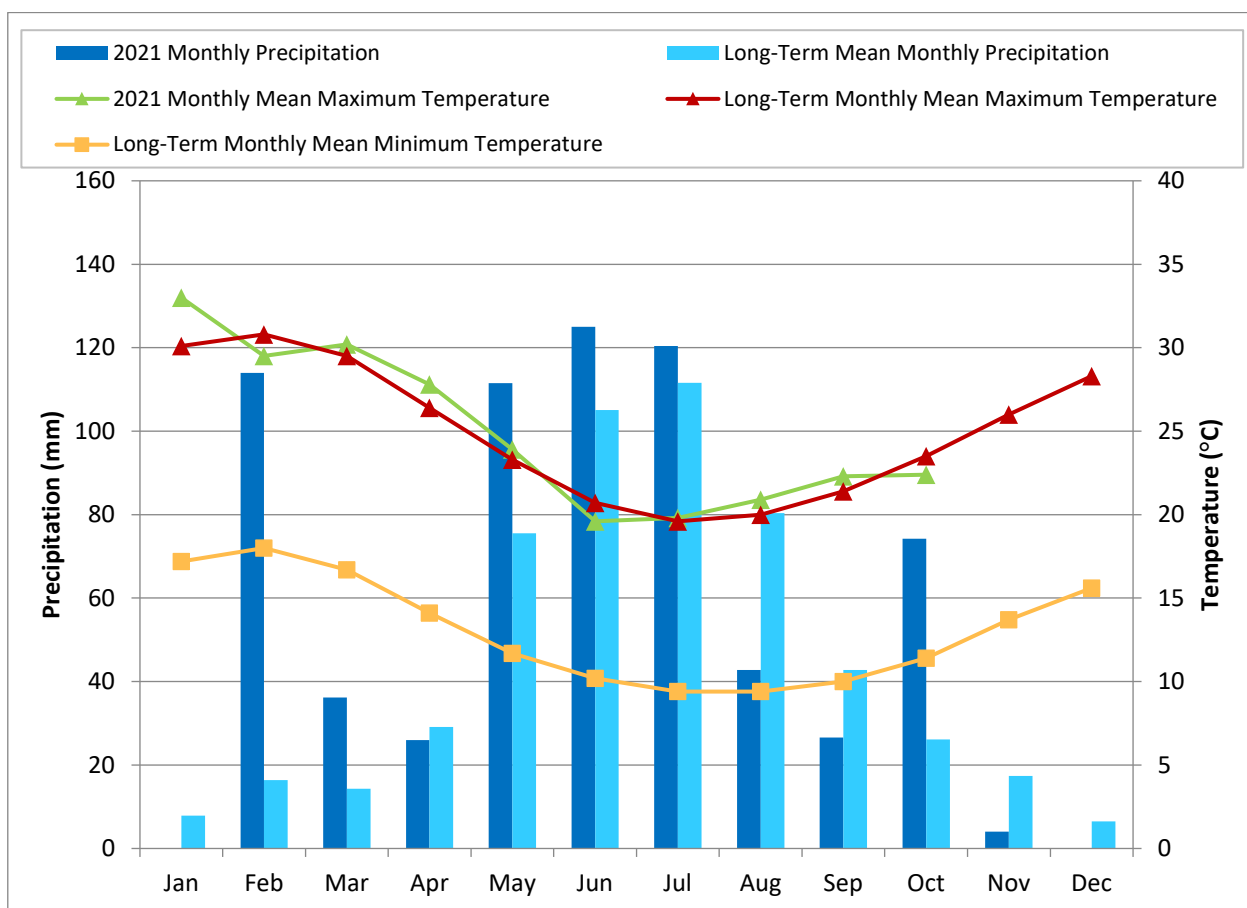
## 2.0 Background

### 2.1 Climate

The CEA is located on the northern edge of the Swan Coastal Plain sub-region in the South-West of W.A., near the southern border of the Northern Sandplains region (Beard 1990). The Swan Coastal Plain sub-region is equivalent to the Swan Coastal Plain Interim Biogeographic Regionalisation for Australia (IBRA) region, while the Northern Sandplains region is equivalent to the Geraldton Sandplains IBRA region (Commonwealth of Australia 2012). The area experiences a dry, warm Mediterranean climate with predominantly winter rainfall (300 – 500mm) and 7 to 8 dry months per year (Beard 1990).

**Figure 2-1** presents key climatic information from Jurien Bay station (Bureau of Meteorology 2021), the most relevant meteorological station to CLW and CNW/Jurien recording long term (and 2021) data.

Annual precipitation recorded prior to field survey (i.e. to October 2021) was 572 mm at Jurien Bay (**Figure 2-1**), which is 63 mm above the average precipitation for that time period (509 mm). Average monthly maximum temperatures were generally comparable from January to October for Jurien Bay.



**Figure 2-1: Mean 2021 and Long-Term Monthly Maximum and Long-Term Monthly Minimum Temperatures (°C), and 2021 and Mean Long-Term Monthly Precipitation (mm), for Jurien Bay (Bureau of Meteorology 2021)**

## 2.2 Flora

Woodman Environmental has previously undertaken numerous flora and vegetation studies within portions of the CEA (Woodman Environmental 2006, 2009a, 2009b, 2014a, 2014b, 2015a, 2016, 2017a, 2018, 2019, 2021), including baseline flora surveys and survey of drill lines for significant flora taxa. The flora of the CEA is therefore considered to be relatively well known. Additional flora studies undertaken on behalf of Tronox by other companies include studies by Mattiske Consulting Pty Ltd (Mattiske) (1996, 1997, 2010, 2012, 2017), Rockwater (2008) and Astron (2013a, 2013b, 2013c). All significant flora data recorded by these surveys is held in the Tronox – Iluka Resources Ltd (Iluka) significant flora database, a jointly managed database containing records covering a large portion of the Northern Sandplains region and northern Swan Coastal Plain sub-region, for use in future planning and impact assessments.

Over 50 significant flora taxa (including Threatened flora taxa, DBCA-classified Priority flora taxa and other taxa of conservation concern) have been recorded during surveys conducted within the CEA between 2000 and 2020, according to the Tronox – Iluka significant flora database alone. Further significant flora taxa are associated with habitat known or likely to occur in the CEA. Such taxa are discussed further with respect to the 2022 exploration drilling program in **Sections 4.1** and **4.2**.

## 2.3 Vegetation

Shepherd *et al.* (2002) mapped and described vegetation system associations in W.A. related to physiognomy, expanding on mapping originally undertaken by Beard (1974-1980). Mapping of these vegetation system associations was most recently refined in 2019 (Government of Western Australia 2019).

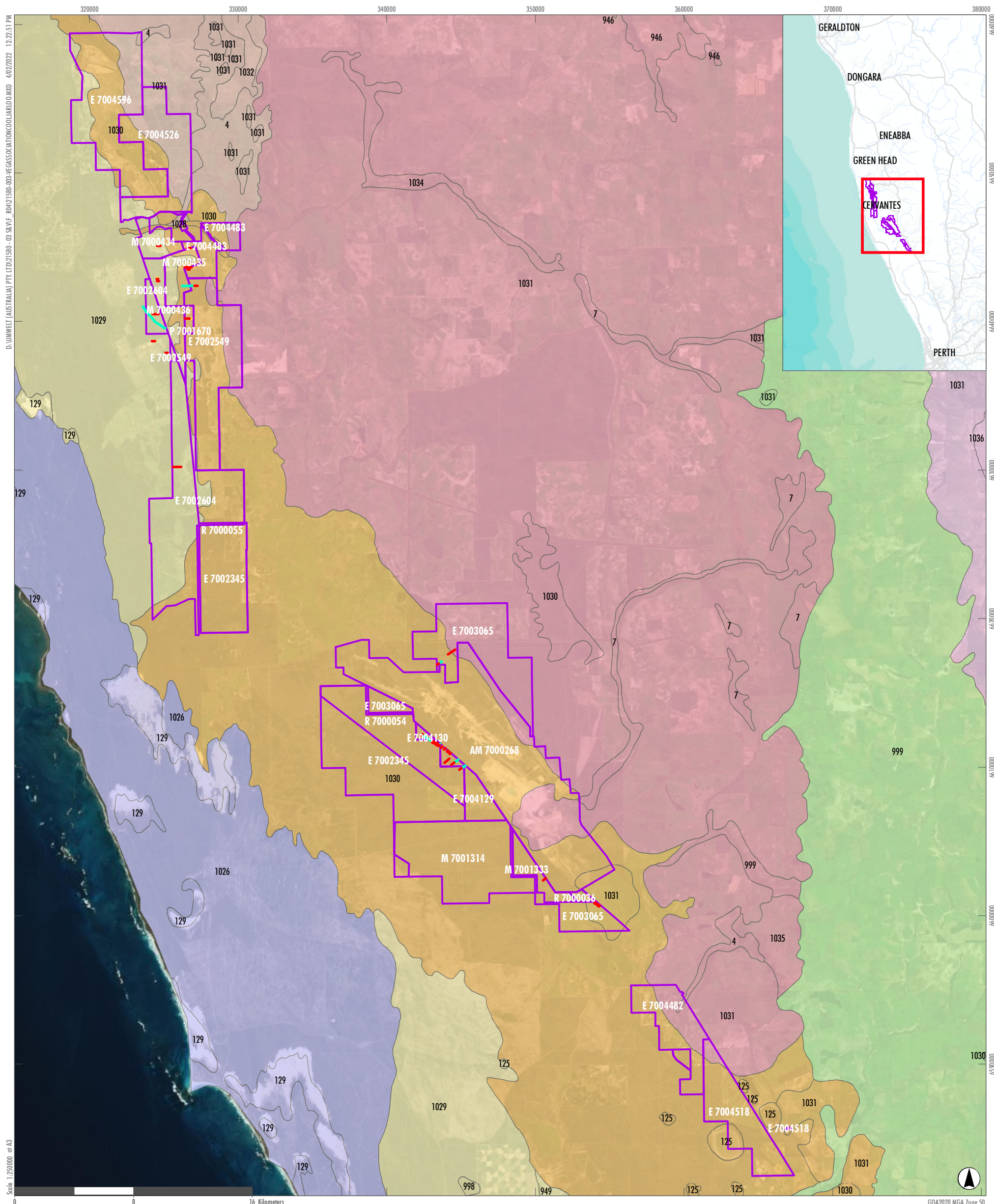
The 2022 exploration drilling program intersects two vegetation system associations. **Table 2-1** presents the current extent of each of these vegetation system associations in relation to the pre-European extent, and the extent within DBCA-managed lands reserved for conservation. The vegetation system association mapping polygons with regard to the to 2022 exploration drilling program are presented on **Figure 2-2**.

**Table 2-1: Vegetation System Associations Intersected by the 2022 Exploration Drilling Program**

Vegetation System Association	Description	Pre-European Extent (ha)	Current Extent (ha)	Percentage of Pre-European Extent Remaining	Percentage of Current Extent held in IUCN Class I-IV Reserves
Bassendean 1030	Low woodland; <i>Banksia attenuata</i> & <i>B. menziesii</i>	116,062	80,191	69.1	13.8
Bassendean 1031	Mosaic: Shrublands; hakea scrub-heath / Shrublands; dryandra heath	4,858	402	8.3	0
Jurien 1029	Shrublands; scrub-heath dryandra-calothamnus association with <i>Banksia prionotes</i> on limestone in the northern Swan Region	68,132	48,883	71.8	34.9
Le Sueur 1031	Mosaic: Shrublands; hakea scrub-heath / Shrublands; dryandra heath	225,533	73,570	32.6	6.9

Vegetation type (VT) mapping based on the results of a floristic analysis has been conducted over the CLW area (Woodman Environmental 2014a). This identified a number of VTs that are of local and potential regional significance. These are discussed further in **Section 4.1.1.2**.

The vegetation of the CEA is characterised by a mixture of Banksia woodland, Kwongan heath and seasonal wetlands or damplands. Mapping of vegetation types (VTs) has been undertaken for the Cooljarloo West Study Area (Woodman Environmental 2014a); this mapping covers the CLW area only, with no vegetation mapping conducted in the CNW/Jurien area to date. A total of 19 VTs were described and mapped within the Cooljarloo West Study Area. A number of VTs mapped in the Cooljarloo West Study Area are considered to be of very high local significance, while several are also considered to be of regional conservation significance (Woodman Environmental 2014a). Such VTs are discussed further with respect to the 2022 exploration drilling program in **Sections 4.1 and 4.2**.



- Legend**
- 2022 Exploration Drilling Program - Drill Line
  - 2022 Exploration Drilling Program - Existing Access
  - 2022 Exploration Drilling Program - Proposed Access
  - Ironox and Yalgoo Minerals Tenements (Cooljarloo Exploration Area)
- Vegetation System**
- BASSEDEAN
  - DANDARAGAN
  - GAIRDNER
  - GUILDERTON
  - JURIEN
  - LE SUEUR
  - WARRO

FIGURE 2.2

Vegetation System Associations of the Cooljarloo Exploration Area



## 3.0 Methods

### 3.1 Desktop Review

#### 3.1.1 Review of Environmental Values of 2022 Exploration Drilling Program

For the purposes of conducting the desktop review and risk assessment, CLW is defined as the area within the boundary of the Cooljarloo West Study Area (defined in Woodman Environmental (2014a)), with a 10 km buffer. CNW/Jurien is a 15.0 x 3.5 km rectangular area drawn around the limit of the 2022 exploration program, with a 10 km buffer, as shown on **Figure 1-1**.

All available data sources relating to environmental values of the areas intersected by the 2022 exploration drilling program were reviewed. These included:

- DBCA Threatened Flora databases (including the Threatened and Priority Flora (TPFL) database and the Western Australian Herbarium (WAHerb) database)
- Tronox – Iluka database, a jointly managed database containing significant flora records, covering a large portion of the Northern Sandplains region and northern Swan Coastal Plain sub-region
- Umwelt’s Significant Flora Database, an internal database containing records from surveys conducted within and in the vicinity of the CEA
- Aerial photography from Landgate’s SLIP database covering the 2022 exploration drilling program
- Land tenure information from Landgate’s SLIP database
- Previous flora and vegetation survey reports relevant to the 2022 exploration drilling program (provided by Tronox)
- DBCA Threatened Ecological Community (TEC) and Priority Ecological Community (PEC) database
- Department of Agriculture, Water and the Environment (DAWE) list of TECs and Threatened Flora
- Spatial vegetation mapping datasets relevant to the 2022 exploration drilling program.

A formal search of DBCA’s TEC and PEC database was not undertaken as part of this review and risk assessment. To determine the presence of any TECs or PECs, the CLW and CNW/Jurien areas were assessed using NatureMap (DBCA 2007-), which allows records in the TEC and PEC database to be viewed. Additionally, a review of the lists of TECs (endorsed by the W.A. Minister for the Environment) (DBCA 2018) and DBCA-classified PECs (DBCA 2021) was also undertaken, to determine if any newly listed TECs or PECs could have occurrences within any of the aforementioned areas.

A formal search of DBCA’s Threatened Flora databases was also not undertaken as part of this review and risk assessment. To determine the presence of significant flora taxa within the search areas, the CLW and CNW/Jurien areas were assessed using NatureMap (DBCA 2007-), which allows records in the TPFL and WAHerb databases to be viewed.

An interrogation of DAWE's Species Profile and Threats (SPRAT) Database for matters of national environmental significance (including those listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)) was undertaken for CLW and CNW/Jurien, using the Protected Matters Search Tool (DAWE 2021a, b). As this search is of a general nature, the search was conducted on a square drawn around the limit of each area, with a buffer of 3 km. As these searches do not provide accurate locality information for matters of environmental significance, any TECs or Threatened flora taxa returned from the search were cross-checked against TECs, PECs and Threatened Flora listed in W.A. that are known to occur within or in the vicinity of the exploration areas (i.e. have records in DBCA's Threatened Flora and TEC and PEC databases, the Tronox – Iluka database, or Umwelt's Significant Flora Database). Taxa that are not known to occur within or in the vicinity of CLW or CNW/Jurien were not considered further. The listing status with regard to the EPBC Act for any such taxa or communities is noted in **Section 3.0**. The results of the searches of the DAWE's SPRAT database are presented in Appendix A.

Data obtained from the sources listed above was overlaid on the 2022 exploration drilling program in a Geographic Information System (GIS) environment, to determine the environmental values that could potentially be impacted by the 2022 exploration drilling program. As part of this process, the locations of the proposed drill lines and access tracks were reviewed with regard to their proximity to existing cleared drill lines and access tracks. Where any proposed drill lines and access tracks are observed to be in close proximity (within approximately 20 m) to tracks that have been historically cleared, proposed drill lines and access tracks to be surveyed are moved to these existing lines to minimise disturbance and impacts. Any such movement of lines is documented in **Section 4.1.1.4** and **4.1.2.4**.

### **3.1.2 Determination of Survey Requirements for 2022 Exploration Drilling Program**

The EMP identifies a number of environmental values that require consideration when conducting exploration drilling within Tronox tenements, including significant flora taxa (including Threatened and Priority flora taxa), significant vegetation communities (including TECs and PECs), significant fauna, wetlands, large trees, slow-growing species and commercial species. However, it is considered that many of these values do not require specific targeted survey or impact assessment in the context of low impact exploration such as the 2022 exploration drilling program, with potential impacts able to be avoided or managed by Tronox during the clearing process in line with the EMP.

In determining survey requirements for the 2022 exploration drilling program, the following environmental values are considered to potentially require targeted survey and impact assessment:

- Significant flora taxa (as outlined by EPA (2016a), including Threatened, Priority or other significant flora taxa such as potentially undescribed taxa
- Significant vegetation communities (as outlined by EPA (2016a), including TECs, PECs or other significant vegetation such as restricted or rare VTs or vegetation system associations
- Wetland areas – includes significant lakes, springs, rivers, streams, or other wetland types.

All drill lines and access tracks proposed as part of the 2022 exploration drilling program were therefore assessed to determine the risk of impacts on the environmental values listed above, and the potential significance of such impacts, considering the results of the review of environmental values as outlined in **Section 4.1.1**. This included investigating the potential for re-alignment of proposed drill lines and access

tracks in a GIS environment to avoid impacts on known locations of the environmental values listed above. Any proposed drill lines or access tracks considered to have the potential to cause a significant impact on any of the environmental values listed above were deemed to require survey. An assessment of impacts on any such environmental values would then be required if actual impacts are likely, following the completion of the field survey.

Specifically for significant flora taxa, taxa requiring targeted survey were determined by conducting an assessment of the likelihood of impact on each significant flora taxon from the 2022 exploration drilling program, and the potential significance of such an impact. It is considered that all taxa listed as Threatened will require survey if there is the potential that individuals or known habitat will be impacted. Other significant flora taxa are discussed below.

For CLW, the majority of significant flora taxa known to occur in this area are relatively well known in terms of preferred habitat and likely distribution, due to extensive historical flora and vegetation surveys (including vegetation mapping) within these areas (e.g. Woodman Environmental 2014a; b; 2015a, 2016, 2017, 2018, 2019; 2020; Mattiske 2017). The likelihood of impact has therefore been determined by considering the proximity of proposed drill lines and access tracks to known locations or known preferred habitat (from vegetation mapping), and the known habitat of each taxon from FloraBase (WAHerb 1998-) where taxa are not known to occur in areas that have undergone vegetation mapping. The potential significance of impacts has been determined by considering the significance of local populations of significant flora taxa to the overall conservation significance of the taxon. For the majority of taxa known from the CLW area, this was originally determined and rated by Woodman Environmental (2014a), however the local populations of some taxa known to occur or potentially occurring within the CLW area have not been rated, and some ratings are not considered to reflect current data. The significance of such taxa was therefore determined using **Table 3-1** below as a framework.

**Table 3-1: Significance of Local Populations to the Overall/Regional Conservation of Taxa**

Rating	Description
High	<ul style="list-style-type: none"> <li>Known range of taxon either entirely located within the exploration area, or within the exploration area and to a radius of &lt;5 km of the exploration area and</li> <li>Taxon known from &lt;10 discrete populations, including within the individual exploration area; and</li> <li>Exploration area on boundary of known regional distribution</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>Known range of taxon extends &lt;50 km and</li> <li>Taxon known from 10-20 discrete populations and</li> <li>Exploration area may be on boundary of known regional distribution</li> </ul>
Low	<ul style="list-style-type: none"> <li>Known range of taxon extends &gt;50 km and</li> <li>Taxon known from &gt;=20 discrete populations and</li> <li>Exploration area not on boundary of known regional distribution</li> </ul>

The preferred habitat for each significant flora taxon known from the CLW area was defined by Woodman Environmental (2015b), and is represented by key habitat VTs, as opposed to non-preferred habitat, which is represented by non-key habitat VTs within which records of the significant flora taxon have occasionally been recorded. The preferred habitat and non-preferred habitat of each significant flora taxon is presented in **Table 4-1** in **Section 4.1.1**. For taxa that were not considered by Woodman Environmental (2015b), all known habitat is considered to be preferred habitat.

For CNW/Jurien, the flora and vegetation, including significant flora taxa, is less well known, with only a limited number of exploration drill line surveys conducted to date (e.g. Woodman Environmental 2014b, 2015a; 2016, 2017, 2018, 2019); however, such surveys have served to identify broad habitats and soil types. The likelihood of impact has therefore been determined by considering the proximity of proposed drill lines and access tracks to known locations of significant flora taxa, the preferred habitat of each taxon, and habitats either known to occur in the area (from previous surveys), or identifiable from aerial photography. The potential significance of impacts has been determined by considering the significance of local populations of significant flora taxa to the overall conservation significance of the taxon. As the local populations of all taxa have not previously been rated, the significance of such taxa has also been considered using **Table 3-1** as a framework.

In the context of the 2022 exploration drilling program, it is considered that only taxa whose local populations are considered to be of High significance (as per **Table 3-1**) to the regional conservation of the taxon will require survey, if there is the potential that individuals or known habitat will be impacted. An assessment of impacts would also be required for such taxa if actual impacts are likely.

Specifically for significant vegetation other than TECs or PECs, VT mapping is available for CLW only (Woodman Environmental 2014a) and is considered in this assessment. VTs considered to represent significant vegetation are defined as those that are rated as having Very High local conservation significance. There is no vegetation mapping available for CNW/Jurien, and therefore significant vegetation other than TECs and PECs can only be determined based on the results of field observations.

## 3.2 Field Survey

### 3.2.1 Survey Timing, Personnel and Licensing

The field survey at CLW was conducted from 27 - 29 October 2021 and 28 October 2021 at CNW/Jurien. The timing of the field survey was chosen following the completion of the Desktop Review component of this assessment, and in line with the results of the review, particularly regarding the flowering times of the majority of significant flora taxa (see **Sections 4.1.1.1** and **4.1.2.1**).

**Table 3-2** lists the personnel involved in fieldwork and plant identifications for the field survey. The Project Manager / Team Leader has had over 10 years previous field experience in the Northern Sandplains region and Swan Coastal Plain sub-region, including conducting previous surveys of proposed drill lines in the CLW and CNW/Jurien areas. The Project Manager / Team Leader is also familiar with other significant flora taxa that could potentially occur in the CLW and CNW/Jurien areas, and has had 10 years of taxonomic experience with the flora of the Northern Sandplains region and Swan Coastal Plain sub-region. All plant material was collected under the scientific licences pursuant to the *W.A. Wildlife Conservation Act 1950* (WC Act) Section 23C and Section 23F as listed in **Table 3-2**.

**Table 3-2: Personnel and Licensing Information**

Personnel	Role	Qualifications	Flora Collecting Permit (WC Act (WA))
David Coultas	Project Manager/ Field Team Leader / Plant identifications	BSc (Environmental Biology) (Hons)	FB62000051 (Section 23C) TFL 23-1819 (Section 23F)
Taylah Hanks	Field survey	BSc (Environmental Science Botany)	FB620000340 (Section 23C)

### 3.2.2 Survey Parameters

The field assessment involved surveying and demarcation to the following parameters as outlined by Tronox (2015, 2019; N. Sibbel *pers. comm.* 2015), and in line with the requirements of a Targeted Survey (EPA 2016b):

- Survey to be conducted by a minimum of two botanists at all times
- Where survey for significant flora is required, each drill line and access track surveyed to a width of at least 10 m (i.e. at least 5 m either side of the provided 'centreline' for the drill line)
- The centrelines for all drill lines surveyed for significant flora are to be flagged
- Where only confirmation of vegetation (e.g., determining if vegetation is a TEC or significant wetland) along drill lines and access tracks is required, only areas requiring confirmation are inspected, with the lines not surveyed to a width of 10 m as per significant flora survey, and the lines not flagged except for deviations around significant vegetation (if required/possible)
- Survey width along each drill line or access track extended to 20 m width if Threatened flora taxa encountered
- Locations of significant flora taxa occurring within the 10 m survey area along drill lines and access tracks recorded using a handheld GPS
- Although only Threatened flora taxa or significant flora taxa whose local populations are considered to be of High significance to the regional conservation of the taxon require survey (following the Desktop Review), locations of all significant flora taxa encountered within the 10 m survey area along drill lines and access tracks to be recorded using a handheld GPS
- Accurate counts of individuals of significant flora taxa recorded where populations are small, or taxon is listed as Threatened, for impact assessment purposes and to support a Permit to Take Threatened Flora (pursuant to the Biodiversity Conservation Act 2016 (BC Act))
- Threatened flora individuals within the 10 m survey area flagged
- Estimations of numbers of individuals for high density populations of Priority flora taxa
- Notes recorded if significant flora taxa extend beyond the 10 m survey area
- Deviations to drill lines and access tracks flagged and recorded with handheld GPS unit around recorded Threatened flora individuals to a distance of 50 m, if no further individuals are found and no further suitable/critical habitat of the taxon exists
- Deviations to drill lines and access tracks flagged and recorded with handheld GPS unit around recorded TEC occurrences to a distance of 50 m, if the TEC occurrence does not continue to extend either side of the drill line or access track
- Deviations should not exacerbate the impact on significant flora or surrounding vegetation

- Deviate around large trees (e.g. *Eucalyptus tottiana*, *Melaleuca preissiana*), slow growing taxa (e.g. *Xanthorrhoea* spp., *Nuytsia floribunda*, *Macrozamia* spp.), commercially valuable wildflowers (e.g. *Banksia hookeriana*), and wetlands wherever possible
- Deviated drill line or access track to align with existing tracks where possible
- Record and flag any above deviations that extend further than 10 m from proposed drill line or access track
- Flag dog legs in drill lines and access tracks at intersections with established tracks and roads, to obscure entry/extent
- General vegetation and soil characters of lines to be recorded
- Wetland conditions and presence of surface water to be recorded
- Record survey track logs.

In addition to the above parameters, the following parameters were also adhered to when conducting the field survey:

- If taxa which could not be identified in the field were encountered, or new or unusual taxa which were not expected to be encountered were identified, specimens were collected and relevant information recorded
- Where existing access tracks were to be used as access or drill lines, they were investigated to determine whether they are well-used, wide enough for drilling machinery, and recently cleared (i.e. no vegetation remaining). If this was the case, they were deemed as not requiring survey, with photographs and notes taken to justify this determination
- Formed gravel tracks/roads were not surveyed as there is no requirement for clearing of vegetation (wide enough and clear of vegetation)
- Any areas of intact native vegetation that were considered to constitute a wetland were investigated, and notes made on the wetland type and condition. Possible alternative routes around wetlands were investigated and/or surveyed if available
- Notes were taken regarding floristic composition in areas where it was determined that listed TECs or PECs may have been encountered.

The following survey methods were employed specifically if Threatened flora taxa or TECs were recorded on drill lines or access tracks:

- Notes regarding physical status of drill lines/track were taken, including whether it occurred on an existing access track that was large and well formed, whether the taxon was recorded on the edge of the existing track, if regrowth was present on historically cleared track etc.
- If an existing access track was wide and well cleared, and impacts on individuals/vegetation could be easily avoided, some additional searching in native vegetation on the edges of the track was undertaken to determine numbers for the purposes of impact assessment, however no deviations were surveyed or flagged

- If the existing access track was in poorer condition (for the purposes of driving), with re-growth vegetation present, searching was undertaken either side of the track/drill line to assess feasibility for deviation
- As per the EMP, deviations are required to be flagged to avoid Threatened Flora locations by 50 m. If further individuals of/potential habitat for Threatened Flora occurred outside the original 10m survey area either side of the drill line or access track, the survey for such a deviation was abandoned, and a line of least impact was adopted, with the goal of avoiding all individuals if possible
- If a presumed TEC was encountered, notes were taken of species composition and landform, and a deviation was flagged to avoid the community where practicable. If no deviation could be flagged within 50 m of the proposed drill lines/access track, the survey for a deviation was abandoned and contact made with Tronox to discuss alternative approaches.

### **3.2.3 General Survey Approach**

Drill lines and access tracks were surveyed by two botanists on foot using handheld GPS units, which contained the provided centrelines in GPS format. These lines were followed in the field, with one person following the provided centreline as closely as possible, and recording (via GPS track log) the walked centerline, and in the case of CLW, flagging as well. The second person walked to the left of the person walking the centreline at a distance of approximately 5 m, also carrying a GPS unit. Locations of significant flora taxa encountered were recorded via waypoints on the GPS units, with numbers of individuals hand-recorded.

Significant deviations (i.e. outside from the original 10 m survey area) were required to be implemented for Threatened flora taxa and TECs where possible, with significant deviations around other significant flora taxa of High significance and wetlands dependent on the level of threat to such features, and the ease of a potential deviation. These deviations were flagged and recorded via GPS track log. With specific regard to significant flora taxa, the original provided centreline was also surveyed to provide an alternative route should a deviation not prove feasible at a later date, however was generally not flagged to avoid confusion in the field.

Clumps of trees or slow growing taxa were also avoided where possible, however as only a very small alteration to the alignment of the original provided centreline was required to avoid such features, these alterations were not considered to be deviations in the same context as Threatened flora or TECs, and were therefore surveyed and flagged as for the remainder of the drill line or access track.

### **3.2.4 Flagging**

Where there was a requirement to survey centrelines (not all drill lines or access tracks required such survey), centrelines (including deviations) were flagged with high visibility pink flagging tape as per Tronox flagging procedures (Tronox 2012) to clearly demarcate the line surveyed. Centrelines were surveyed and demarcated as straight as possible, with flagging clearly visible preferably from both directions. Where vegetation was dense, flagging was undertaken more regularly with consecutive flagging established so that it could be seen from the previous flagging point. Only drill lines and access tracks located on existing tracks that were clearly discernible were not flagged in this fashion.

Individuals or populations of Threatened flora taxa were demarcated with red and white flagging tape. Where there were small numbers of individuals, individuals were flagged by tying on the individual, or adjacent to them on a larger plant in the case of smaller individuals. If large numbers were encountered or specific delineation of plants on existing tracks was required, sections (or the start and end of the population) were demarcated with long lengths of flagging tape.

### 3.2.5 Plant Identification and Collection

Prior to the survey, personnel carrying out the survey familiarised themselves with the significant flora taxa requiring survey, including viewing pressed specimens in Umwelt's significant flora collection, and viewing photographs. Photographs or specimens of each taxon, where available, were also carried in the field to assist with positive identification. Personnel also familiarised themselves with the floristic composition of significant vegetation communities, to allow for positive identification in the field.

Specimens of any unknown taxa that could not be identified in the field or required verification were collected and pressed for later identification at the WAHerb. Taxon nomenclature generally follows *FloraBase* (WAHerb 1998-), with all names checked on *FloraBase* to ensure their validity and to confirm the conservation status of each taxon.

Specimens of interest, including significant flora taxa, range extensions of taxa and potential new taxa, will be sent to the WAHerb for consideration for vouchering as soon as practicable. However as this process is via donation, the WAHerb may not voucher such specimens, in accordance with its own requirements. The specimen vouchering will be supported by completed Threatened and Priority Flora Report Forms (TPFRFs) submitted to DBCA in the case of Threatened and DBCA-classified Priority flora taxa.

### 3.2.6 Limitations of Survey

Field survey was conducted by experienced and competent personnel, with the team leader (see **Table 3-2**) having previous experience in conducting surveys within the CEA. The field surveys were conducted within the flowering periods of the majority of the target significant flora taxa that require flowering material for identification, with the following exceptions identified during the desktop review:

- *Caladenia denticulata* subsp. *albicans* (P1) (CLW – flowers late August – September)
- *Thelymitra pulcherrima* (P2) (CLW – flowers July-early September)

As the desktop review was undertaken after the flowering periods of these taxa, survey was not able to be undertaken for them in 2020. However, as survey is required in appropriate habitat only, further survey would only be required if appropriate habitat were identified during the field survey undertaken in October 2020. This is discussed further in **Sections 4.1, 4.2 and 5.0**.

Rainfall prior to the field survey was above-average for CLW and CNW/Jurien, and monthly maximum temperatures were comparable to long-term averages (see **Section 2.1**); climatic factors are therefore not considered to be limitations of the survey.

All drill lines requiring survey were surveyed on foot, with no access issues affecting the results of the survey. No issues such as recent disturbance or fire were encountered which significantly affected survey results. Some areas at CNW/Jurien were relatively recently burnt; however, this did not affect diagnosis of vegetation types, including significant vegetation.



### 3.3 Impact Assessment

The Exploration Environmental Assessment 2016 scope of works (Tronox 2015), which was also applied to this current assessment, requires an assessment of impacts of the 2022 exploration drilling program at both a local and regional scale. In the case of CLW, 'local' refers to the distribution of an environmental value within the Cooljarloo West Assessment Area. The Cooljarloo West Assessment Area is defined as the Cooljarloo West Study Area, excluding the Cooljarloo Mine Lease and the Cooljarloo West Development Envelope (**Figure 1-1**). For CNW/Jurien, 'local' refers to the CNW/Jurien area as described in **Section 3.1.1**. 'Regional' refers to the overall distribution of an environmental value within W.A.

#### 3.3.1 Significant Flora

As outlined in **Section 3.1.2**, an assessment of impacts of the 2022 exploration drilling program is only required for taxa listed as Threatened, and other significant flora taxa whose local populations are considered to be of High significance to the regional conservation of the taxon.

For the assessment of impacts on significant flora at a local scale, two areas were considered:

- 3 m clearing width (i.e. 1.5 m either side of the walked centreline, and including any deviations established); this represents the widest area that is likely to be cleared
- 10 m risk area (i.e. 5 m either side of the centreline – equivalent to the 10 m survey area)

As exact locations of individuals of Threatened taxa were recorded, the impact on these flora taxa can be accurately assessed, and therefore only the 3 m clearing width has been applied to the assessment of impacts on Threatened taxa. Because of frequently large population sizes and distributions of other significant flora taxa (particularly Priority flora taxa), representative locations and population estimates only were recorded within the minimum survey area of at least 10 m, and therefore locations may represent a large number of plants over extended portions of this area. Therefore, only the 10 m risk area has been applied to the assessment of impacts on other significant flora taxa.

The assessment of impacts on significant flora taxa at a local scale considered the impact on numbers of point locations in the local area. A rating of the proposed local impact on significant flora taxa was undertaken using the scale presented in **Table 3-3**. This scale was developed by Woodman Environmental during impact assessments in other diverse areas of W.A., and was used during the assessment of impacts of the Tronox Dongara Titanium Minerals Project (Woodman Environmental 2011).

Additionally, an assessment of impacts at a local scale to the preferred habitat of significant flora taxa previously recorded at CLW was undertaken. The preferred habitat for each significant flora taxon was defined by Woodman Environmental (2015b), and is represented by key habitat VTs, as opposed to non-preferred habitat, which is represented by non-key habitat VTs within which records of the significant flora taxon have occasionally been recorded in. The preferred habitat and non-preferred habitat of each significant flora taxon is presented in **Table 4-1** in **Section 4.1.1.1**. For taxa that were not considered by Woodman Environmental (2015b), all known habitat is considered to be preferred habitat in lieu of further information obtained during field survey.

The level of impact on the preferred habitat of significant flora taxa was calculated by determining the area of the VT(s) that are known preferred habitat for a particular taxon proposed to be impacted (using the 3 m

clearing width), and comparing this to the total area of such VTs in the Cooljarloo West Assessment Area. The level of impact was then rated utilising the scale presented in **Table 3-3**. This assessment of impacts was conducted for all of the significant flora taxa identified by the desktop review as requiring survey and impact assessment whose preferred habitat was impacted, regardless of whether the taxon was recorded by the field survey.

A similar habitat assessment could not be conducted for CNW/Jurien, as no VT mapping has been conducted at these areas to date.

**Table 3-3: Scale of Local Level of Impact on Significant Flora Taxa**

Impact on Point Locations in Local Area		Impact on Preferred Habitat in Local Area	
<25 % of known locations impacted	Low Impact	<10 % habitat area impacted	Low Impact
25 – 50 % of known locations impacted	Moderate Impact	10 – 30 % habitat area impacted	Moderate Impact
>50 % of known locations impacted	High Impact	>30 % habitat area impacted	High Impact

The assessment of impacts on significant flora taxa involved placing the local impacts on significant flora taxa (point locations only) into a regional context, by comparing the level of the local impact (**Table 3-3**) with the significance of the local populations to the overall conservation significance of the taxon (**Table 3-1**). This comparison was made via the matrix presented in **Table 3-4**, which determined a rating of the regional significance of impacts on significant flora taxa.

**Table 3-4: Matrix Determining Regional Significance of Impact on Significant Flora Taxa**

		Local Impact (Table 3-3)		
		Low	Moderate	High
Significance of Local Populations to the Overall/Regional Conservation of Taxa (Table 3-1)	Low	Low	Low	Low
	Moderate	Low	Moderate	Moderate-High
	High	Low	Moderate-High	High

In the event of the recording of significant flora taxa which were not expected (based on the results of the desktop review) to be encountered during the field survey, an assessment of impacts was undertaken if the taxon was listed as Threatened. Otherwise, the significance of the local populations to the overall conservation of such taxa was determined using **Table 3-1**, with an assessment of impacts undertaken if the significance of the local populations to the overall conservation of such taxa was rated High.

### 3.3.2 Significant Vegetation and Wetlands

The assessment of impacts of the 2022 exploration drilling program at a local scale on significant vegetation at CLW considers the proposed 3 m clearing width only. The area of significant vegetation to be impacted was compared to the total area mapped in the local area as per Woodman Environmental (2014a). The level of impact was then rated using the scale presented in **Table 3-5**.

**Table 3-5: Scale of Local Level of Impact on Significant Vegetation**

Significance of Impact	Criteria
<b>Low</b>	Clearing <1 % of mapped area of significant vegetation
<b>Moderate</b>	Clearing 1 – 10 % of mapped area of significant vegetation
<b>High</b>	Clearing >10 % of mapped area of significant vegetation

As outlined in **Section 3.1.2**, there is no vegetation mapping available for CNW/Jurien, and therefore significant vegetation can only be determined based on the results of field observations. Therefore, the local level of impact on any significant vegetation cannot be rated using the scale in **Table 3-5**. Any such impacts are therefore discussed only.

The level of impact on specific significant vegetation communities in a regional context is not rated as for local impacts, as the regional extent of significant vegetation communities has generally not been quantified. Such impacts are therefore discussed only.

## 4.0 Results

### 4.1 Desktop Review

#### 4.1.1 Cooljarloo West

##### 4.1.1.1 Significant Flora

118 significant flora taxa are known to occur within the CLW area; these are listed in **Table 4-1**. The assessment of likelihood and significance of impact identified 11 taxa that may be impacted by the 2022 exploration drilling program that are either listed Threatened taxa, or are considered to be of High significance to the regional conservation status of the taxon (as per **Table 3-1**). These taxa are:

- *Andersonia gracilis* (Threatened)
- *Anigozanthos viridis* subsp. *terraspectans* (Threatened)
- *Babingtonia delicata* (P1)
- *Caladenia denticulata* subsp. *albicans* (P1)
- *Calectasia palustris* (P2)
- *Levenhookia preissii* (P1)
- *Lyginia excelsa* (P2)
- *Macarthuria keigheryi* (Threatened)
- *Paracaleana dixonii* (Threatened)
- *Stylidium tinkeri* (P2) and
- *Thelymitra pulcherrima* (P2).

The likely presence of these taxa necessitates field survey of habitat that may be impacted by the 2022 exploration drilling program, prior to any disturbance. Based on the recorded flowering times of the above taxa (WAHerb 1998-), the most appropriate time to conduct survey for all taxa except *Caladenia denticulata* subsp. *albicans* and *Thelymitra pulcherrima* (P2) is mid-October to mid-November.

*Caladenia denticulata* subsp. *albicans* (P1) is a relatively recently described species (2015); no records were known from the CLW Study Area, however, in 2018, a collection from 1991 was identified as this taxon. This record has coordinates that are located north of Woolka Road in VT 17, however, the coordinates do not match the locality description, with the locality description placing it adjacent to Woolka Road, 8 km west of Cooljarloo Road (WA Herbarium 1998-). Coincidentally, the habitat description indicates that the record may have been made in vegetation representing VT 17, albeit adjacent to a wetland area.

This taxon can only be surveyed for during its flowering period – this is considered to be late August to September. Therefore, a specific survey in late August-September would also be required. However, given the uncertainty of the location of this record and the habitat that it occurs in, coupled with the absence of any other records of this taxon from the many historical surveys conducted in the CLW Study Area, it is considered that further investigation of this record is required, to ascertain whether this taxon is indeed present within the CLW Study Area, and if so, what habitat it occurs within. Such investigation could only occur during the known flowering period of this taxon; as this was prior to this desktop review being undertaken, such investigation cannot occur as part of this assessment.

*Thelymitra pulcherrima* (P2) can also only be surveyed for during its flowering period – this is considered to be late July to early September. Therefore, a specific survey in late July-early September is considered to be required. However, as this desktop review was undertaken after the flowering period of *Thelymitra pulcherrima* (P2), survey for this taxon cannot be undertaken as part of this assessment.

**Table 4-1: Survey Requirements for Significant Flora Taxa – Cooljarloo West**

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Acacia benthamii</i>	P2	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 1 km to west of the CLW Study Area.</li> <li>• Nearest known location is the northern-most known location of this taxon (others known south of Guilderton).</li> <li>• Habitat as per WAHerb (1998-) includes yellow sand, typically on limestone breakaways.</li> <li>• Habitat very unlikely to be impacted.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Acacia plicata</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 10 km to the south-east of the CLW Study Area.</li> <li>• Habitat as per WAHerb (1998-) is usually rocky soils with <i>Eucalyptus wandoo</i>.</li> <li>• Habitat very unlikely to be impacted.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Acacia retrorsa</i>	P2	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 8 km to the north of the CLW Study Area.</li> <li>• Habitat as per WAHerb (1998-) includes grey sand and lateritic gravel, sandy loam in gullies or on hilltops of <i>Eucalyptus</i> or <i>Corymbia</i> woodlands.</li> <li>• Habitat very unlikely to be impacted.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Allocasuarina grevilleoides</i>	P3	Preferred – 7 (lateritic variation)	No	<ul style="list-style-type: none"> <li>• Local populations of Low-Moderate significance to regional conservation status.</li> <li>• No impact on preferred habitat of taxon.</li> <li>• No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - no impact on known habitat.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Andersonia gracilis</i>	Threatened (BC Act and EPBC Act)	Preferred - 1, 2, 5 Non-preferred - 6, 7, 9b, 17, 18	Yes (Preferred – 1, 5) Non-preferred – 6, 9b, 17, 18)	<ul style="list-style-type: none"> <li>Local populations of High significance to regional conservation status.</li> <li>Is a listed Threatened taxon.</li> <li>Preferred habitat of this taxon to be impacted.</li> <li>Known locations in vicinity of proposed exploration.</li> </ul>	<b>Survey required for this taxon</b> - listed Threatened taxon, known habitat of this taxon to be impacted, known locations in vicinity of proposed exploration.
<i>Angianthus micropodioides</i>	P3	Preferred – 2 Non-preferred - 5, 13	Yes (Non-preferred – 5)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on non-preferred habitat of taxon.</li> <li>Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status, no impact on preferred habitat.
<i>Anigozanthos humilis</i> subsp. Badgingarra (S.D. Hopper 7114)	P2	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known location is approximately 7 km east of the CLW Study Area.</li> <li>Habitat as per WAHerb (1998-) at verified records is alluvial flats, often with <i>Eucalyptus wandoo</i> or <i>Corymbia calophylla</i>.</li> <li>Habitat very unlikely to be impacted.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Anigozanthos humilis</i> subsp. <i>chrysanthus</i>	P4	Preferred - 17, 18	Yes (Preferred - 17, 18)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Anigozanthos viridis</i> subsp. <i>terraspectans</i>	Threatened (BC Act and EPBC Act)	Preferred – 1 Non-preferred - 2, 4, 5, 6, 9b, 17, 18	Yes (Preferred – 1 Non-preferred – 5, 6, 9b, 17, 18)	<ul style="list-style-type: none"> <li>Local populations of High significance to regional conservation status.</li> <li>Is a listed Threatened taxon.</li> <li>Preferred habitat of this taxon to be impacted.</li> <li>No known locations in the vicinity of proposed exploration however locations of <i>A. viridis</i> ?<i>terraspectans</i> in vicinity.</li> </ul>	<b>Survey required for this taxon</b> - listed Threatened taxon, preferred habitat of this taxon to be impacted.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Arnocrinum gracillimum</i>	P3	Preferred - 17	Yes (Preferred - 17)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Asterolasia drummondii</i>	P4	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest location 7 km to the south-east of the CLW Study Area on laterite escarpment.</li> <li>Habitat includes rocky areas on lateritic hills often with <i>Eucalyptus lane-polei</i>.</li> <li>Habitat very unlikely to be impacted.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Babingtonia cherticola</i>	P3	Preferred - 1	Yes (Preferred - 1)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> <li>All vouchered specimens in the vicinity of the CLW Study Area are <i>B. aff. cherticola</i>; with records of <i>B. cherticola</i> occurring 55-70km to the east and north-east (WAHerb 1998-).</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Babingtonia delicata</i>	P1	Preferred – 1, 5 Non-preferred – 17	Yes (Preferred – 1, 5 Non-preferred - 17)	<ul style="list-style-type: none"> <li>Local populations of Moderate-High significance to regional conservation status.</li> <li>Proposed low impact on preferred habitat of taxon.</li> <li>Locations in the vicinity of proposed exploration.</li> </ul>	<b>Survey required for this taxon</b> - local populations of High significance to regional conservation status.



Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Babingtonia urbana</i>	P3	Preferred - 1, 2 Non-preferred - 5, 7, 9a, 9b, 12, 13, 16, 17, 18	Yes (Preferred – 1 Non-preferred – 5, 9b, 17, 18)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on habitat of taxon.</li> <li>Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Banksia dallaneyi</i> subsp. <i>pollostata</i>	P3	Preferred - 1, 5, 17, 18	Yes (Preferred - 1, 5, 17, 18)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Beaufortia bicolor</i>	P3	Preferred - 17 Non-preferred - 7	Yes (Preferred – 17)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Beaufortia eriocephala</i>	P3	Preferred - 7	No	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>No impact on known habitat.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status / no impact on known habitat.
<i>Beyeria cinerea</i> subsp. <i>cinerea</i>	P3	Preferred - 8	No	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>No impact on known habitat.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - no impact on known habitat.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Beyeria gardneri</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest location 1 km to the east of the CLW Study Area on laterite escarpment.</li> <li>• Habitat generally yellow sand, often over laterite, in upland areas.</li> <li>• Habitat very unlikely to be impacted within CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Boronia tenuis</i>	P4	Preferred - 1, 17	Yes (Preferred - 1, 17)	<ul style="list-style-type: none"> <li>• Very likely to have been historically mis-identified, as no specimen has ever been vouchered as per WAHerb (1998-) and has not been recorded by recent surveys.</li> <li>• Known from many regional locations over a wide distribution, any local populations not of High significance to overall significance of taxon, any impacts on taxon therefore not likely to be significant.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - likely has been historically mis-identified, any local populations not of High significance to regional conservation status.
<i>Byblis gigantea</i>	P3	Preferred - 2	No	<ul style="list-style-type: none"> <li>• One WAHerb record of this taxon within the CLW area.</li> <li>• Nearest known location is the northern-most limit of the known range of the taxon (other records are from Perth region south).</li> <li>• No impact on known habitat.</li> <li>• Likely to be a mis-identification as the closely related <i>Byblis lamellata</i> is common in the CLW area.</li> </ul>	<b>No survey required for this taxon</b> - taxon considered unlikely to occur in CLW area based on known distribution and likely mis-identification of specimen from CLW area.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Caladenia denticulata</i> subsp. <i>albicans</i>	P1	Possibly 17 record details	Possibly (17)	<ul style="list-style-type: none"> <li>• Single record in Study Area only recently (2018) determined – taxon collected in 1991.</li> <li>• Record requires verification as taxon has not been collected recently, and record coordinates do not match locality description.</li> <li>• Record not in vicinity of proposed exploration.</li> <li>• Habitat of record described as Banksia woodland on deep sand adjacent to winter-wet depression; similar habitat likely to be impacted (VTs 17 and 18).</li> <li>• Known from 5 locations over 120 km; Study Area record is the southern-most record; local populations likely to be of moderate-high significance to regional conservation status.</li> <li>• Any impacts on taxon are therefore potentially significant.</li> </ul>	<b>Survey required for this taxon</b> – local populations of Moderate-High significance to regional conservation status.
<i>Calectasia palustris</i>	P2	Preferred - 2, 7 Non-preferred - 5	Yes (Preferred – 7 Non-preferred – 5)	<ul style="list-style-type: none"> <li>• Local populations of Moderate-High significance to regional conservation status.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• Known locations in the vicinity of proposed exploration.</li> </ul>	<b>Survey required for this taxon</b> - local populations of Moderate-High significance to regional conservation status.
<i>Calytrix ecalycata</i> subsp. <i>brevis</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 9 km to the south-east of the CLW Study Area.</li> <li>• Habitat at nearest known locations is grey sand on the margins of seasonal wetlands.</li> <li>• Similar habitat exists in the CLW Study Area and may be impacted by proposed exploration however numerous surveys have not recorded this taxon.</li> </ul>	<b>No survey required for this taxon</b> - taxon considered highly unlikely to occur in the CLW Study Area.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Catacolea enodis</i>	P2	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 9 km to the north north-east of the CLW Study Area.</li> <li>• Habitat is sand over laterite in upland areas, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to be impacted within CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Chordifex chaunocoleus</i>	P4	-	Unlikely	<ul style="list-style-type: none"> <li>• Very likely to have been historically mis-identified, as other specimens previously identified as this taxon from the vicinity of the CLW Study Area have been re-identified as <i>Chordifex reseminans</i> (P2) (per WAHerb 1998-); all other locations are near Toodyay.</li> </ul>	<b>No survey required for this taxon</b> - taxon considered highly unlikely to occur in the CLW Study Area.
<i>Chordifex reseminans</i>	P2	Preferred - 1, 2, 5 Non-preferred – 6, 7, 17, 18	Yes (Preferred – 1, 5 Non-preferred 6, 17, 18)	<ul style="list-style-type: none"> <li>• Local populations of Moderate significance to regional conservation status.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Comesperma rhadinocarpum</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area – taxon has recently been recorded adjacent to CLW Study Area in Tronox’s Cooljarloo Mine rehabilitation.</li> <li>• Origin of taxon in rehabilitation unknown – possibly introduced through seeding, or from topsoil from mined area.</li> <li>• Nearest known location is approximately 7 km to the north-east of the CLW Study Area.</li> <li>• Habitat at nearest known locations is sandy soils over laterite in shrubland or Banksia woodland, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to be impacted</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Conospermum scaposum</i>	P3	Preferred - 1, 5, 17, 18	Yes (Preferred - 1, 5, 17, 18)	<ul style="list-style-type: none"> <li>Local populations of Low significance to regional conservation status</li> <li>Potential low impact on habitat of taxon.</li> <li>Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Conostephium magnum</i>	P4	Preferred - 17 Non-preferred - 1, 5, 6, 7, 8, 9b, 18	Yes (Preferred – 17 Non-preferred - 1, 5, 6, 9b, 18)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Cristonia biloba</i> subsp. <i>pubescens</i>	P2	Potentially 7 (preferred) and 17 (non-preferred)	No (Non-preferred – 17)	<ul style="list-style-type: none"> <li><i>Cristonia biloba</i> has previously been recorded in the CLW Study Area at two locations.</li> <li>Records require verification to determine subspecies however distribution indicates that they will likely represent subsp. <i>pubescens</i>.</li> <li>Preferred habitat in the CLW Study Area requires verification, however known habitat as per WAHerb (1998-) is areas with lateritic gravel, indicating VT 7 is likely to be preferred (lateritic variation) which is not proposed to be impacted; considered unlikely to occur with any frequency in VT 17.</li> <li>Local populations of Moderate-High significance to regional conservation status.</li> <li>Potential low impact on non-preferred habitat of taxon, no impact on preferred location.</li> <li>No known locations in the vicinity of exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Dampiera tephrea</i>	P2	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 7 km to the east north-east of the CLW Study Area.</li> <li>• Habitat as per WAHerb (1998-) variable, often near rivers or on limestone.</li> <li>• Similar habitat exists in the CLW Study Area and may be impacted by proposed exploration, however taxon not recorded by recent surveys.</li> <li>• Taxon known from over 20 populations over a large distribution, local populations therefore of Low significance to overall significance of taxon, any impacts on taxon therefore are not likely to be significant.</li> </ul>	<b>No survey required for this taxon</b> - taxon considered unlikely to occur in the CLW Study Area, any local populations would not be of High significance to regional conservation status.
<i>Desmocladius biformis</i>	P3	Preferred - 17	Yes (Preferred - 17)	<ul style="list-style-type: none"> <li>• Local populations of Low-Moderate significance to regional conservation status.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Desmocladius elongatus</i>	P4	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 6 km to north-east of the CLW Study Area.</li> <li>• Habitat includes white or grey dry sand in heath.</li> <li>• Habitat very unlikely to be impacted within CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Desmocladius microcarpus</i>	P2	Preferred – 1, 5 Non-preferred – 17	Unlikely	<ul style="list-style-type: none"> <li>Historical records of taxon occur in CLW Study Area, however are known to have been mis-identified, with all records representing <i>Desmocladius nodatus</i>; taxon therefore not known from CLW Study Area.</li> <li>Nearest known location is approximately 6 km to the south-east of the CLW Study Area.</li> <li>Habitat at nearest known location is unknown, however majority of other locations are in upland areas, usually with laterite, as per WAHerb (1998).</li> <li>Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Desmocladius nodatus</i>	P3	Preferred - 1, 5 Non-preferred - 2, 6, 17	Yes (Preferred – 1, 5 Non-preferred – 6, 17)	<ul style="list-style-type: none"> <li>Local populations of Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Diuris</i> aff. <i>laxiflora</i> (formerly <i>D. ?eburnea</i> )	-	Preferred - 10	No	<ul style="list-style-type: none"> <li>Local population of High significance to regional conservation status – taxonomy unclear.</li> <li>Only known to occur in very specific wetland habitat (Wongonderrah Swamp) that is restricted in the CLW area.</li> <li>No impact on known habitat.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - no impact on known habitat.
<i>Drosera leioblastus</i>	P1	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known location is approximately 2 km to south-east of the CLW Study Area.</li> <li>Habitat includes white sandy soils with laterite pebbles, as per WAHerb (1998-).</li> <li>Habitat unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Drosera leucostigma</i>	P1	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 2 km to north-east of the CLW Study Area.</li> <li>• Habitat includes sandy soils on the margins of winter wet depressions on scarp, as per WAHerb (1998-).</li> <li>• Habitat unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Drosera pedicellaris</i>	P1	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 7 km to east of the CLW Study Area.</li> <li>• Habitat includes sandy soils (over laterite) in heath, as per WAHerb (1998-).</li> <li>• Habitat unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Drosera prophylla</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 3 km to east of the CLW Study Area.</li> <li>• Habitat includes sand over laterite or gravelly soils in upland areas of heath, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Eleocharis keigheryi</i>	Threatened (BC Act and EPBC Act)	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 8 km to the south-east of the CLW Study Area.</li> <li>• Habitat is fresh water creeks and claypans with standing water, as per WAHerb (1998-).</li> <li>• Such habitat exists in the CLW Study Area, however is very restricted and not in vicinity of 2022 exploration.</li> <li>• Habitat very unlikely to be impacted.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.



Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Eremophila glabra</i> subsp. <i>chlorella</i>	T	2	No	<ul style="list-style-type: none"> <li>Local populations of High significance to regional conservation status.</li> <li>Is a listed Threatened taxon.</li> <li>No impact on known habitat</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - no impact on known habitat.
<i>Eryngium pinnatifidum</i> subsp. <i>Palustre</i> (G.J. Keighery 13459)	P3	Preferred – 2 Non-preferred - 16	No	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>No impact on known habitat.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status / no impact on known habitat.
<i>Eucalyptus abdita</i>	P2	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known location is approximately 3 km north-east of the CLW Study Area.</li> <li>Habitat includes laterite, sandy-clay with gravel or laterite, slopes and breakaways, as per WAHerb (1998-).</li> <li>Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i>	P4	Preferred - 18	Yes (Preferred - 18)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Eucalyptus pendens</i>	P4	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known location is approximately 4 km to north-east of the CLW Study Area, forming the southern extent of the taxon's distribution.</li> <li>Habitat usually sand over laterite on hilltops and breakaways, as per WAHerb (1998).</li> <li>Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Eucalyptus x carnabyi</i>	P4	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 9 km to east of the CLW Study Area on laterite escarpment.</li> <li>• Habitat includes grey sand, sandy loam over laterite and lateritic ridges, as per WAHerb (1998).</li> <li>• Habitat very unlikely to be impacted.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Frankenia glomerata</i>	P4	Preferred – 2 Non-preferred - 13	No	<ul style="list-style-type: none"> <li>• Local populations of Low significance to regional conservation status.</li> <li>• No impact on known habitat.</li> <li>• No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status / no impact on known habitat.
<i>Gompholobium gairdnerianum</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 9 km to east of the CLW Study Area on laterite escarpment.</li> <li>• Habitat in the vicinity of the CLW area includes brown sand over laterite on hill tops and ridges in heath, as per WAHerb (1998).</li> <li>• Habitat very unlikely to be impacted.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Goodenia perryi</i>	P3	Preferred - 17, 18	Yes (Preferred - 17; 18)	<ul style="list-style-type: none"> <li>• Three known records in CLW Study Area; otherwise nearest known location located approximately 130 km to east of proposed exploration.</li> <li>• Likely to be a historical mis-identification as has not been recorded recently despite numerous surveys.</li> <li>• Local populations of Low-Moderate significance to regional conservation status.</li> <li>• Habitat includes yellow sand.</li> <li>• Potential low impact on habitat of taxon.</li> <li>• No known locations in vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - likely to be a historical mis-identification, unlikely to occur in vicinity of exploration.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Grevillea calliantha</i>	Threatened (BC Act and EPBC Act)	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest location 8 km to the east of the CLW Study Area on laterite escarpment.</li> <li>• Habitat includes gravelly grey or yellow sand over laterite, as per WAHerb (1998).</li> <li>• Habitat unlikely to be impacted.</li> </ul>	<b>No survey required for this taxon</b> - habitat unlikely to be impacted.
<i>Grevillea drummondii</i>	P4	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest location 7 km to the south-east of the CLW Study Area on laterite escarpment.</li> <li>• Habitat includes rocky hillsides, lateritic breakaways or granite outcrops, as per WAHerb (1998).</li> <li>• Habitat very unlikely to be impacted.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Grevillea florida</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest location 7 km to the east of the CLW Study Area on laterite escarpment.</li> <li>• Habitat includes sand over laterite, gravel, in upland areas, as per WAHerb (1998).</li> <li>• Habitat very unlikely to be impacted.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Grevillea saccata</i>	P4	Preferred - 18	Yes (Preferred - 18)	<ul style="list-style-type: none"> <li>• Local populations of Low significance to regional conservation status.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• No known locations in vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Grevillea synapheae</i> subsp. <i>minyulo</i>	P1	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location located approximately 6 km to east of the CLW Study Area.</li> <li>• Habitat includes grey to yellow-brown sand or brown sandy loam with gravel and laterite on undulating plains, slopes and ridges, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Grevillea thyrsoides</i> subsp. <i>thyrsoides</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location located approximately 6 km to south-east of the CLW Study Area.</li> <li>• Habitat includes grey sand, brown-grey to grey sandy gravel/gravelly sand, brown sandy loam over laterite in heath, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Grevillea</i> sp. Cooljarloo (B.J. Keighery 28 B)	P1	Preferred - 1, 2, 5 Non-preferred - 7, 13, 14, 16, 17	Yes (Preferred – 1, 5 Non-preferred – 17)	<ul style="list-style-type: none"> <li>• Local populations of Moderate significance to regional conservation status.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Guichenotia alba</i>	P3	Preferred - 1, 7	Yes (Preferred – 1)	<ul style="list-style-type: none"> <li>• Local populations of Low-Moderate significance to regional conservation status.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Hakea longiflora</i>	P3	Preferred - 1, 18	Yes (Preferred - 1, 18)	<ul style="list-style-type: none"> <li>• Local populations of Low-Moderate significance to regional conservation status.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Hakea megalosperma</i>	Threatened (BC Act and EPBC Act)	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest location 7 km to the east of the CLW Study Area.</li> <li>• Habitat includes grey sand on lateritic hills or rocky outcrops, brown sandy loam with lateritic gravel over laterite in heath, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - listed Threatened taxon, potential for habitat of this taxon to be impacted.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Haloragis foliosa</i>	P3	Preferred - 2 Non-preferred - 1	No (Non-preferred - 1)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on non-preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Hensmania stoniella</i>	P3	Preferred – 17, 18 Non-preferred - 5, 6	Yes (Preferred – 17, 18 Non-preferred – 5, 6)	<ul style="list-style-type: none"> <li>Local populations of Low significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Hibbertia helianthemoides</i>	P4	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Location in Tronox-Iluka Database is erroneous; taxon no longer considered to occur in area, restricted to the Stirling Range.</li> </ul>	<b>No survey required for this taxon</b> - taxon does not occur in CLW Area.
<i>Hibbertia leptotheca</i>	P3	Preferred - 8	No	<ul style="list-style-type: none"> <li>Local populations of Low significance to regional conservation status.</li> <li>No impact on known habitat.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - no impact on known habitat.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Hopkinsia anoectocolea</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area – taxon has recently been recorded adjacent to CLW Study Area in Tronox’s Cooljarloo Mine rehabilitation.</li> <li>• Origin of taxon in rehabilitation unknown – possibly introduced through seeding, or from topsoil from mined area.</li> <li>• Habitat is winter-wet depressions, sometimes saline, as per WAHerb (1998-).</li> <li>• Habitat exists in CLW Study Area, however taxon has not been recorded by numerous surveys.</li> <li>• Taxon unlikely to be impacted.</li> </ul>	<b>No survey required for this taxon</b> - taxon unlikely to be impacted.
<i>Hypocalymma gardneri</i>	P3	Preferred - 17	Yes (Preferred - 17)	<ul style="list-style-type: none"> <li>• Local populations of Low-Moderate significance to regional conservation status.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Hypocalymma serrulatum</i>	P2	Preferred - 7, 10	No	<ul style="list-style-type: none"> <li>• Local populations of Low-Moderate significance to regional conservation status.</li> <li>• No impact on known habitat.</li> <li>• No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status / no impact on known habitat.
<i>Hypocalymma</i> sp. Cataby (G.J. Keighery 5151)	P2	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 8 km to the south-east of the CLW Study Area.</li> <li>• Habitat at nearest known locations is rocky banks of creekline.</li> <li>• Habitat unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat unlikely to be present.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Hypocalymma</i> sp. Dandaragan (C.A. Gardner 9014)	P1	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Locations in Tronox-Iluka Database are erroneous; taxon confirmed as <i>Hypocalymma xanthopetalum</i> by subsequent surveys.</li> </ul>	<b>No survey required for this taxon</b> - taxon does not occur in CLW Area.
<i>Hypocalymma tetrapterum</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known location is 7 km east of CLW Study Area.</li> <li>Habitat includes grey sand, brown loam sand and lateritic gravel in areas including river banks, hill tops, slopes and breakaways, as per WAHerb (1998-).</li> <li>Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Hypolaena robusta</i>	P4	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known locations are within 5 km of CLW Study Area.</li> <li>Habitat includes white or grey sand at times over laterite, on sandplains, low rises and hilltops.</li> <li>Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Isopogon autumnalis</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known location is 2 km north-east of CLW Study Area.</li> <li>Habitat includes white, grey or yellow sand, often over laterite, on low rises in upland areas, as per WAHerb (1998-).</li> <li>Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	Preferred - 1, 5 Non-preferred - 2, 6, 7, 9a, 9b, 12, 17, 18	Yes (Preferred – 1, 5 Non-preferred – 6, 9b, 17, 18)	<ul style="list-style-type: none"> <li>Local populations of Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>Known locations in vicinity of exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Isotropis cuneifolia</i> subsp. <i>glabra</i>	P3	Preferred – 1, 5, 9b	Yes (Preferred – 1, 5, 9b)	<ul style="list-style-type: none"> <li>Local populations of Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in vicinity of exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Jacksonia anthoclada</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known locations are approximately 6 km north-east of CLW Study Area.</li> <li>Habitat includes grey sand over laterite, on sandplains, slopes and upland areas, as per WAHerb (1998-).</li> <li>Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Jacksonia carduacea</i>	P3	Preferred - 1, 2, 5 Non-preferred - 17, 18	Yes (Preferred – 1, 5 Non-preferred - 17, 18)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Lepidobolus densus</i>	P4	Preferred - 1, 18	Yes (Preferred - 1, 18)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Lepidobolus quadratus</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known location is 6 km north-east of CLW Study Area.</li> <li>Habitat includes yellow-brown or grey sand with lateritic gravel or over laterite on slopes and upland areas, as per WAHerb (1998-).</li> <li>Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.



Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Lepyrodia curvescens</i>	P2	Preferred – 5 Non-preferred - 17	Yes (Preferred – 5 Non-preferred - 17)	<ul style="list-style-type: none"> <li>Local populations of Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Leucopogon foliosus</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known location is 10 km to east of CLW Study Area.</li> <li>Habitat includes white to grey sand, yellow gravelly sand or brown loamy gravel over laterite, on slopes and upland areas of heath, as per WAHerb (1998-).</li> <li>Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Leucopogon</i> sp. Yanchep (M. Hislop 1986)	P3	Preferred - 1	Yes (Preferred - 1)	<ul style="list-style-type: none"> <li>Local population of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Levenhookia preissii</i>	P1	Preferred - 1, 6, 17 Non-preferred - 7	Yes (Preferred – 1, 6, 17)	<ul style="list-style-type: none"> <li>Local populations of Moderate-High significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>Known locations in vicinity of proposed exploration.</li> </ul>	<b>Survey required for this taxon</b> - local populations of Moderate-High significance to regional conservation status.
<i>Lyginia excelsa</i>	P2	Preferred - 17	Yes (Preferred - 17)	<ul style="list-style-type: none"> <li>Local populations of Moderate-High significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>Known locations in the vicinity of proposed exploration.</li> </ul>	<b>Survey required for this taxon</b> - local populations of Moderate-High significance to regional conservation status.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Macarthuria keigheryi</i>	Threatened (BC Act and EPBC Act)	Preferred - 17, 18 Non-preferred - 1, 5	Yes (Preferred - 17, 18 Non-preferred - 1, 5)	<ul style="list-style-type: none"> <li>• Is a listed Threatened taxon.</li> <li>• Preferred habitat of this taxon to be impacted.</li> <li>• Known locations in vicinity of proposed exploration.</li> </ul>	<b>Survey required for this taxon</b> - listed Threatened taxon, known habitat of this taxon to be impacted.
<i>Meionectes tenuifolia</i>	P3	Preferred - 1	Yes (Preferred - 1)	<ul style="list-style-type: none"> <li>• Local populations of Low-Moderate significance to regional conservation status.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Myriophyllum muelleri</i>	P1	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Coordinates of nearest known location are immediately adjacent to north-west corner of CLW Study Area, however, these do not match locality description (Nambung River), with actual record likely to be further north.</li> <li>• Habitat is freshwater lagoons, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Ornduffia submersa</i>	P4	Preferred - 9a	No	<ul style="list-style-type: none"> <li>• Low populations of Low-Moderate significance to regional conservation status.</li> <li>• No impact on known habitat.</li> <li>• No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - no impact on known habitat.
<i>Paracaleana dixonii</i>	Threatened (BC Act and EPBC Act)	Preferred - 17	Yes (Preferred - 17)	<ul style="list-style-type: none"> <li>• Is a listed Threatened taxon.</li> <li>• Known habitat of this taxon to be impacted.</li> <li>• No known locations in vicinity of proposed exploration.</li> </ul>	<b>Survey required for this taxon</b> - listed Threatened taxon.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Persoonia filiformis</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is 1.4 km to north-east of CLW Study Area.</li> <li>• Habitat includes yellow, white or grey sand over laterite, on undulating plains, low hills and upper slopes, as per WAHerb (1998-).</li> <li>• Habitat unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Persoonia rudis</i>	P3	Preferred - 17	Yes (Preferred - 17)	<ul style="list-style-type: none"> <li>• Local populations of Low significance to regional conservation status.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is in the vicinity of Wongonderrah Road located approximately 7 km north-east of the CLW Study Area.</li> <li>• Habitat includes white or grey sand with lateritic gravel in upland areas, as per WAHerb (1998-).</li> <li>• Habitat unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Platysace ramosissima</i>	P3	Preferred – 17 Non-preferred - 1, 2, 5, 6, 7, 18	Yes (Preferred – 17 Non-preferred - 1, 5, 6, 18)	<ul style="list-style-type: none"> <li>• Local populations of Low significance to regional conservation status.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Ptychosema pusillum</i>	Threatened (BC Act and EPBC Act)	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 5 km to the south-east of the CLW Study Area.</li> <li>• Habitat at nearest known locations is grey sand in Banksia woodland on the margins of seasonal wetlands.</li> <li>• Similar habitat exists in the CLW Study Area and may be impacted by proposed exploration, however numerous surveys have not recorded this taxon.</li> </ul>	<b>No survey required for this taxon</b> - taxon considered highly unlikely to occur in the CLW Study Area.
<i>Schoenus badius</i>	P2	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Location is erroneous - WAHerb specimen may be missing. Taxon no longer considered to occur in area, restricted to area from near Dongara to Geraldton – other specimens from the CLW Study Area previously identified as this taxon have been re-identified as <i>Schoenus pennisetis</i>.</li> </ul>	<b>No survey required for this taxon</b> - taxon does not occur in CLW Area.
<i>Schoenus griffinianus</i>	P4	Preferred - 17, 18 Non-preferred - 1, 5, 6,	Yes (Preferred - 17, 18 Non-preferred - 1, 5, 6)	<ul style="list-style-type: none"> <li>• Local populations of Low significance to regional conservation status.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Schoenus natans</i>	P4	Preferred - 9a	No	<ul style="list-style-type: none"> <li>• Local populations of Low significance to regional conservation status.</li> <li>• No impact on known habitat.</li> <li>• No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - no impact on known habitat.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Schoenus pennisetis</i>	P3	Preferred - 1, 5 Non-preferred - 2, 7, 10, 17, 18	Yes (Preferred – 1, 5 Non-preferred – 17, 18)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Stenanthemum sublineare</i>	P2	Preferred - 17	Yes (Preferred - 17)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Styphelia undulata</i>	P2	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known location is 10 km to north-east of the CLW Study Area.</li> <li>Habitat includes white or grey sand over laterite, on sandplains, slopes and upland areas, as per WAHerb (1998-).</li> <li>Habitat unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> – habitat very unlikely to be impacted
<i>Stylidium aceratum</i>	P3	Preferred - 2, 6	Yes (Preferred - 6)	<ul style="list-style-type: none"> <li>Local populations of Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Stylidium aeonioides</i>	P4	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known location is within 700 m of the north-east corner of the CLW Study Area.</li> <li>Habitat includes lateritic gravelly soils on breakaways and hills, as per WAHerb (1998-).</li> <li>Habitat unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Stylidium carnosum</i> subsp. ?Narrow leaves (J.A. Wege 490)	P1	Preferred - 18	Yes (Preferred - 18)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Stylidium hymenocraspedum</i>	P3	Preferred – 17, 18 Non-preferred – 1, 2, 5, 6, 7, 13	Yes (Preferred – 17, 18 Non-preferred – 1, 5, 6)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Stylidium longitubum</i>	P4	Preferred – 1, 9a, 13	Yes (Preferred - 1)	<ul style="list-style-type: none"> <li>Local populations of Low significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Stylidium maritimum</i>	P3	Preferred – 17	Yes (Preferred - 17)	<ul style="list-style-type: none"> <li>Local populations of Low significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Stylidium periscelianthum</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known location is approximately 8 km south-east of the CLW Study Area, growing with <i>Eucalyptus wandoo</i> on a loamy clay mid-slope.</li> <li>Habitat includes winter-wet clay soils on flats and slopes of low hills (usually granitic), as per WAHerb (1998-).</li> <li>Habitat unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Stylidium tinkerii</i>	P2	-	Possible	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 3 km east of the CLW Study Area.</li> <li>• Habitat includes winter-wet low-lying plains and wetlands on grey-brown clay sand or grey/brown sandy or clay loam, as per WAHerb (1998-).</li> <li>• Known from &lt;10 populations over a reasonable distribution, local populations therefore likely to be of Moderate-High significance to overall significance of taxon.</li> </ul>	<b>Survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Stylidium torticarpum</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location plots 3 km north of the Study Area, however is erroneous, as locality description is in the Mount Lesueur area.</li> <li>• Taxon not considered to occur in the vicinity of the CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - taxon not considered to occur in the vicinity of the CLW Study Area.
<i>Synaphea endotherix</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 10 km east of the CLW Study Area.</li> <li>• Habitat includes yellow/brown gravelly loam or white-grey lateritic sand on low rises, mid-slopes or ridges, as per WAHerb (1998-).</li> <li>• Habitat unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Tetrateca angulata</i>	P3	-	Unlikely	<ul style="list-style-type: none"> <li>• Taxon not known from CLW Study Area.</li> <li>• Nearest known location is approximately 8 km east of CLW Study Area.</li> <li>• Habitat includes gravelly white-grey sand, grey-brown clay loam or sandy brown loam on low hills, bases of ridges and breakaways, as per WAHerb (1998-).</li> <li>• Habitat unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Thelymitra apiculata</i>	P4	Preferred – 1	Yes (Preferred – 1)	<ul style="list-style-type: none"> <li>Local populations of Low significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Thelymitra pulcherrima</i>	P2	Preferred – 1 Non-preferred – 17	Yes (Preferred – 1 Non-preferred – 17)	<ul style="list-style-type: none"> <li>Local populations of Moderate-High significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>Survey required for this taxon</b> - local populations of High significance to regional conservation status.
<i>Thelymitra stellata</i>	Threatened (BC Act and EPBC Act)	-	Unlikely	<ul style="list-style-type: none"> <li>Taxon not known from CLW Study Area.</li> <li>Nearest known location is approximately 8 km east of CLW Study Area.</li> <li>Habitat includes gravelly grey sand, yellow-brown clay loam or brown sandy loam on hills, slopes, ridges and breakaways, as per WAHerb (1998-).</li> <li>Habitat very unlikely to be present in CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Thysanotus glaucus</i>	P4	Preferred – 17 Non-preferred - 18	Yes (Preferred – 17 Non-preferred - 18)	<ul style="list-style-type: none"> <li>Local populations of Low significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.
<i>Verticordia amphigia</i>	P3	Preferred - 18	Yes (Preferred - 18)	<ul style="list-style-type: none"> <li>Local populations of Low-Moderate significance to regional conservation status.</li> <li>Potential low impact on preferred habitat of taxon.</li> <li>No known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.



Significant Flora Taxon	Status	Habitat (VTs) in CLW Area	Habitat Proposed to be Impacted	Significance of Local Populations and Proximity to Impact*	Proposed Survey Requirements
<i>Verticordia huegelii</i> var. <i>tridens</i>	P3	Preferred - 7	Yes (Preferred - 7)	<ul style="list-style-type: none"> <li>• Previously recorded in CLW Study Area, however confirmed by Mattiske (2017) as a mis-identification, correct identification is <i>Verticordia huegelii</i> var. <i>decumbens</i>.</li> <li>• Taxon not considered to occur within or in the vicinity of the CLW Study Area.</li> </ul>	<b>No survey required for this taxon</b> - taxon not considered to occur within or in the vicinity of the CLW Study Area.
<i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>	P4	Preferred - 1, 5 Non-preferred - 2, 6, 7, 17, 18	Yes (Preferred – 1, 5 Non-preferred – 6, 17, 18)	<ul style="list-style-type: none"> <li>• Local populations of Low significance to regional conservation status.</li> <li>• Potential low impact on preferred habitat of taxon.</li> <li>• Known locations in the vicinity of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - local populations not of High significance to regional conservation status.

\*Records within approximately 1 km of drill lines or access tracks are considered to be within the vicinity of proposed exploration in **Table 4-1**.

#### 4.1.1.2 Significant Vegetation and Wetlands

No known locations of any TECs as endorsed by the W.A. Minister for the Environment, or DBCA-classified PECs (excluding the 'Banksia woodlands of the Swan Coastal Plain' PEC (P3), as discussed below), are known to occur within the CLW Area (DBCA 2007-). A review of the most recent lists of such TECs and PECs indicates that no new communities have been listed as either TECs or PECs that could occur in the CLW Area. Woodman Environmental (2014a) found that none of the VTs mapped in the CLW Study Area represent any such TEC or PEC.

The search of the DAWE's EPBC Act Protected Matters databases for the CLW Study Area (DAWE 2021a) identified that the 'Banksia Woodlands of the Swan Coastal Plain' TEC (Endangered) and the Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain TEC (Critically Endangered) are likely to occur in the CLW Area.

No VTs mapped within the Cooljarloo West Study Area represent the Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain TEC (Critically Endangered) (Woodman Environmental 2014a). *Eucalyptus gomphocephala* was not recorded by the 2012 assessment of the Cooljarloo West Study Area. This taxon was previously recorded during the Mullering Survey (overlapping the western side of the Cooljarloo West Study Area) within community H10 (Woodman Environmental 2006); however, this taxon was not considered to be a significant component of this community (H10 was described as low heath dominated by *Melaleuca systema* on yellow sand on dunes). This community is therefore not considered to occur within the CLW Area.

With regard to the 2022 exploration drilling program at CLW, it is considered that VTs 17 and 18 represent this TEC as both VTs possess the key diagnostic characteristics of this community (Threatened Species Scientific Committee 2016). As these VTs are both widespread within the CLW Study Area, it is not possible to deviate around this TEC. Existing VT mapping has accurately delineated the distribution of this TEC and as such no additional survey is considered to be required (as per **Section 4.1.1.4**). The description of VT 6 indicates that some occurrences of this VT could also represent the 'Banksia Woodlands of the Swan Coastal Plain' TEC. The presence of this TEC within each individual occurrence of VT 6 intersected by the 2022 exploration drilling program will be verified during the field survey.

The DBCA-classified PEC 'Banksia Woodlands of the Swan Coastal Plain' (P3) is considered equivalent to the 'Banksia Woodlands of the Swan Coastal Plain' TEC. This PEC is therefore also considered to be intersected by the 2022 exploration drilling program at CLW. However, for the purposes of consistency, this community is referred to as the 'Banksia Woodlands of the Swan Coastal Plain' TEC only for the remainder of this report. All information relating to the 'Banksia Woodlands of the Swan Coastal Plain' presented in this report is therefore also relevant to the 'Banksia Woodlands of the Swan Coastal Plain' PEC.

It should be noted that there are a number of Floristic Community Types (FCTs) defined on the southern Swan Coastal Plain (Gibson et al. 1994; Government of Western Australia 2000) that are considered to be components of the 'Banksia Woodlands of the Swan Coastal Plain'. However, the above studies did not sample the CEA, and therefore vegetation in the CEA cannot be aligned with FCTs defined by these studies.

Six VTs are intersected by the 2022 exploration drilling program, being VTs 1, 5, 6, 9b, 17 and 18. A description of each VT and its conservation significance rating is provided in Appendix B. Of these VTs, VTs 6 and 9b are considered to be significant vegetation as they were rated as being of Very High significance. These VTs were locally restricted within the CLW Study Area (Woodman Environmental 2014a), however

were considered to be represented or likely represented within conservation reserves or Unallocated Crown Land (UCL) outside the CLW Study Area. Small sections of VT 6 and 9b, also considered to be wetland habitats, are intersected by proposed exploration drill lines. However, no occurrences of these VTs intersected by the proposed exploration are considered likely to be significantly impacted, and therefore no survey to assess possible deviations around these features is considered necessary. The vegetation types of these sections will be verified during the survey.

VTs 1 and 5, although not restricted vegetation types, are known to occur in damp depressions that are considered to be wetland areas. VTs 6 and 9b also occur in damp depressions and are considered to be wetland areas. Several proposed exploration drill lines and access intersect these VTs, however the impact of the 2022 exploration drilling program is not considered likely to be significant, and therefore no survey to assess possible deviations around these features is considered necessary.

The 2022 exploration drilling program intersects three vegetation system associations as defined by Shepherd et al. (2002), being Bassendean 1030, Bassendean 1031 and Le Sueur 1031. The Bassendean 1030 and Le Sueur 1031 vegetation system associations have 69.1 % and 32.6 % of their pre-European extent remaining respectively (Government of Western Australia 2019), with the 2022 exploration drilling program only temporarily reducing their extent by a small amount. The Bassendean 1031 vegetation system association has 8.3 % of its pre-European extent remaining. However, the drill lines and access tracks intersecting this vegetation system association occur within cleared paddocks. Therefore, no field survey with regard to vegetation system associations is considered to be required.

#### **4.1.1.3 Other Environmental Values**

Several drill lines do not require survey, as they are located in cleared paddocks, or have been surveyed recently (within the past five years).

The 2022 exploration drilling program at CLW does not intersect any conservation reserves or DBCA Clearing Regulations Environmentally Sensitive Areas (ESAs) (DBCA 2011).

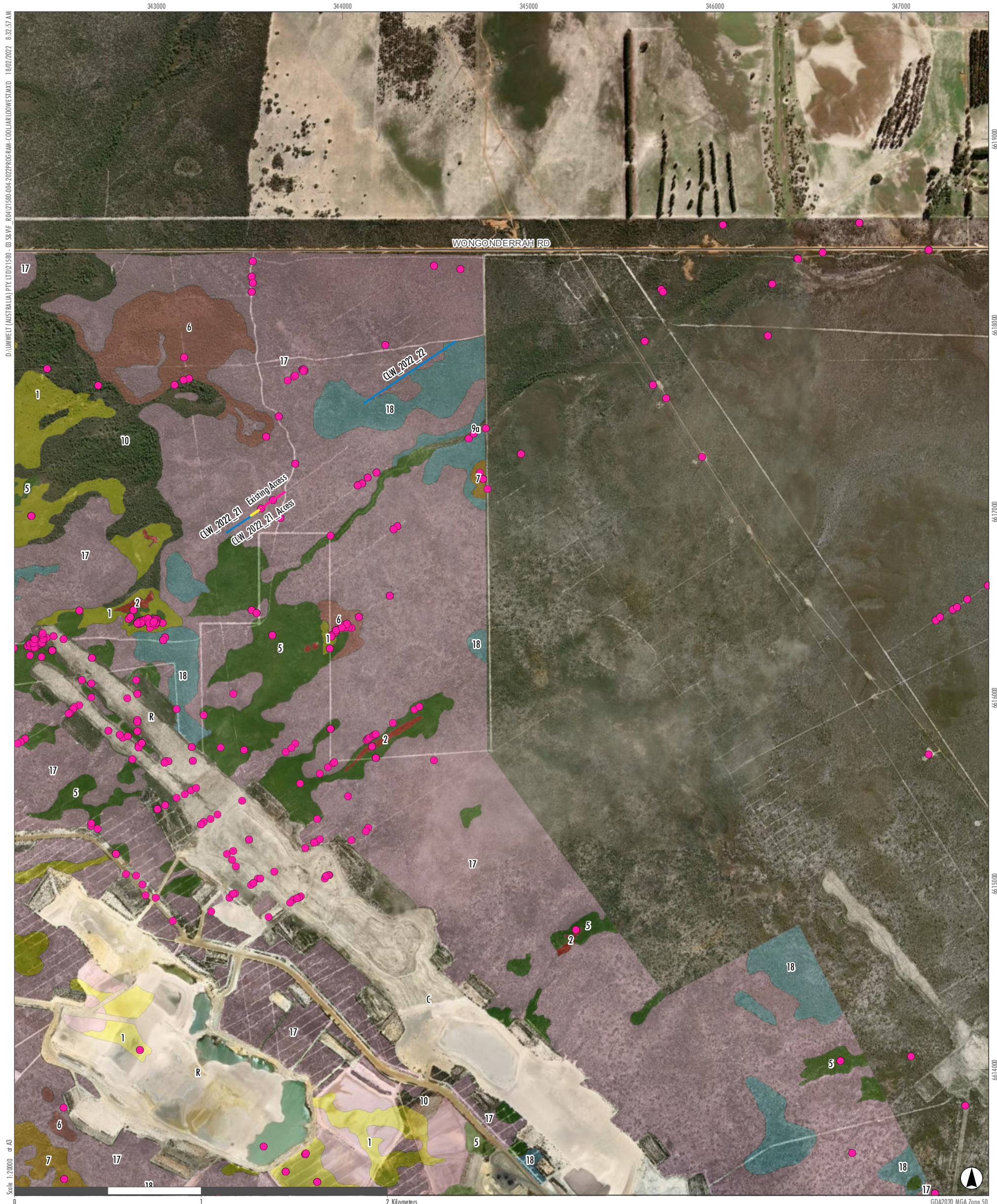
#### **4.1.1.4 Drill Lines Requiring Survey**

**Table 4-2** summarises the findings of the desktop assessment of proposed drill lines and access tracks, and the requirement for any survey along such drill lines and access tracks. A total of 0.3 km of proposed access tracks and 3.3 km of proposed drill lines (total distance 3.6 km) are considered to require survey at CLW (**Figure 4-1**).

**Table 4-2: Cooljarloo West Drill Line and Proposed Access Survey Requirements**

Line/Access	Survey Requirement	Reasoning	Comments
CLW_2022_1	No	Located in cleared paddock	
CLW_2022_2	No	Located in cleared paddock	
CLW_2022_3	No	Located in cleared paddock	
CLW_2022_4	No	Located in cleared paddock	
CLW_2022_5	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_6	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_6_Access	Yes	Habitat for significant flora taxa that require survey	Created by Umwelt
CLW_2022_7	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_7_Access	Yes	Habitat for significant flora taxa that require survey	Created by Umwelt
CLW_2022_8	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_9	No	Line recently surveyed (2020 - line CLW_2021_10)	
CLW_2022_10	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_11	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_12	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_13	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_13_Access	Yes	Habitat for significant flora taxa that require survey	Created by Umwelt
CLW_2022_14	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_14_Access	Yes	Habitat for significant flora taxa that require survey	Created by Umwelt
CLW_2022_15	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_16	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_17	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_18	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_19	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_20	Yes	Habitat for significant flora taxa that require survey	

Line/Access	Survey Requirement	Reasoning	Comments
CLW_2022_21	Yes	Habitat for significant flora taxa that require survey	
CLW_2022_21_Access	Yes	Habitat for significant flora taxa that require survey	Created by Umwelt
CLW_2022_22	Yes	Habitat for significant flora taxa that require survey	



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- Legend**
- Proposed Drill Line - Survey Required
  - Proposed Drill Line - No Survey Required
  - Proposed Access - Survey Required
  - Existing Access
  - Significant Flora Location
  - Roads
- Vegetation Types**
- 1
  - 2
  - 5
  - 6
  - 7
  - 17
  - 18

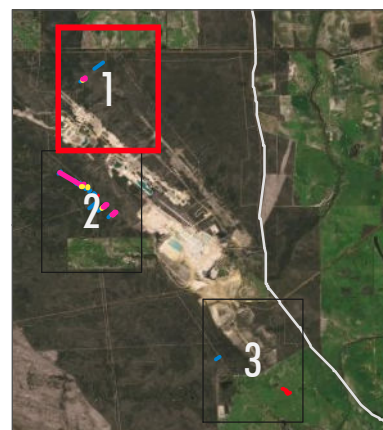
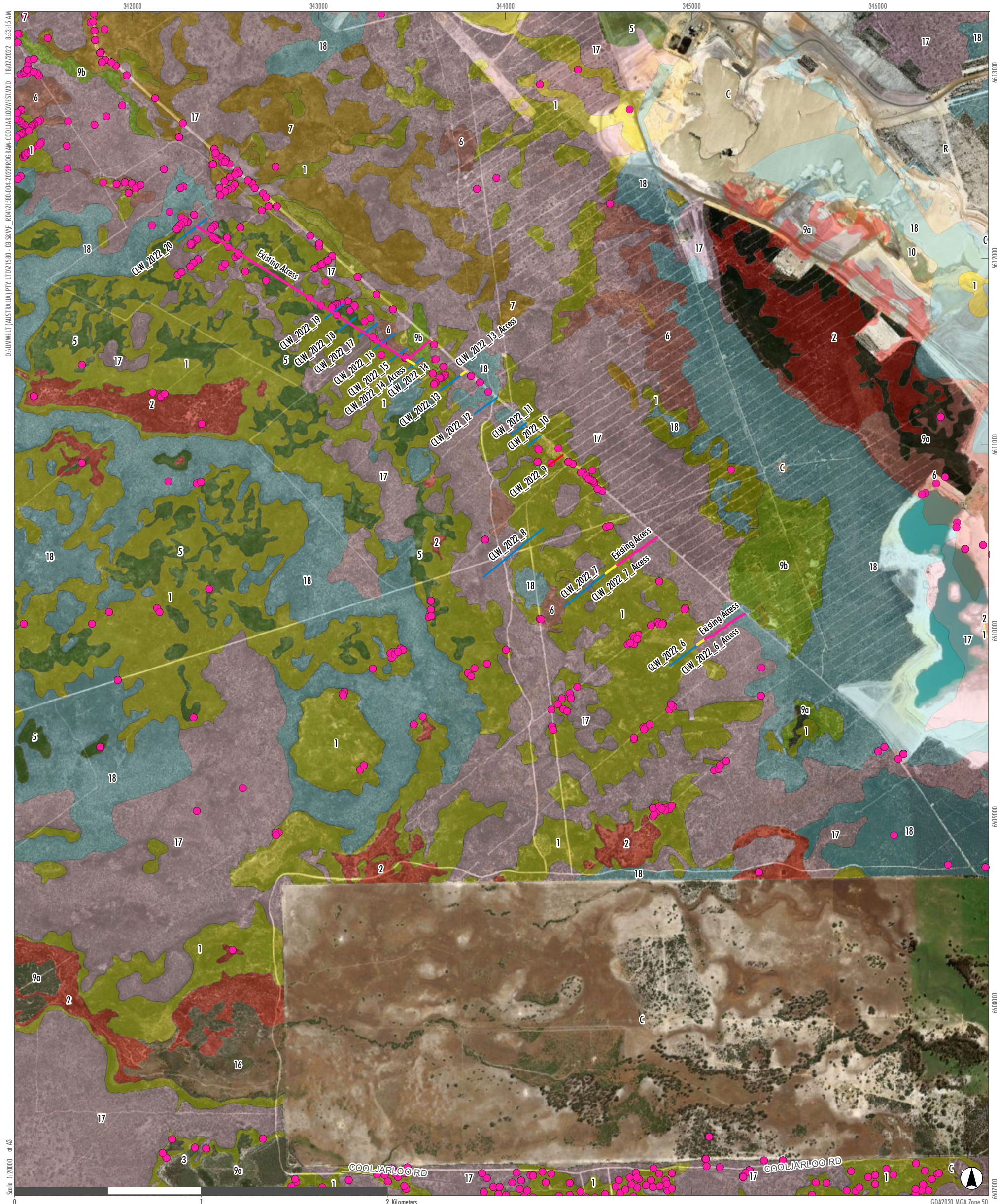


FIGURE 4.1

Sheet 1

2022 Exploration Drilling Program – Cooljarloo West  
– Drill Line and Access Track Survey Requirements



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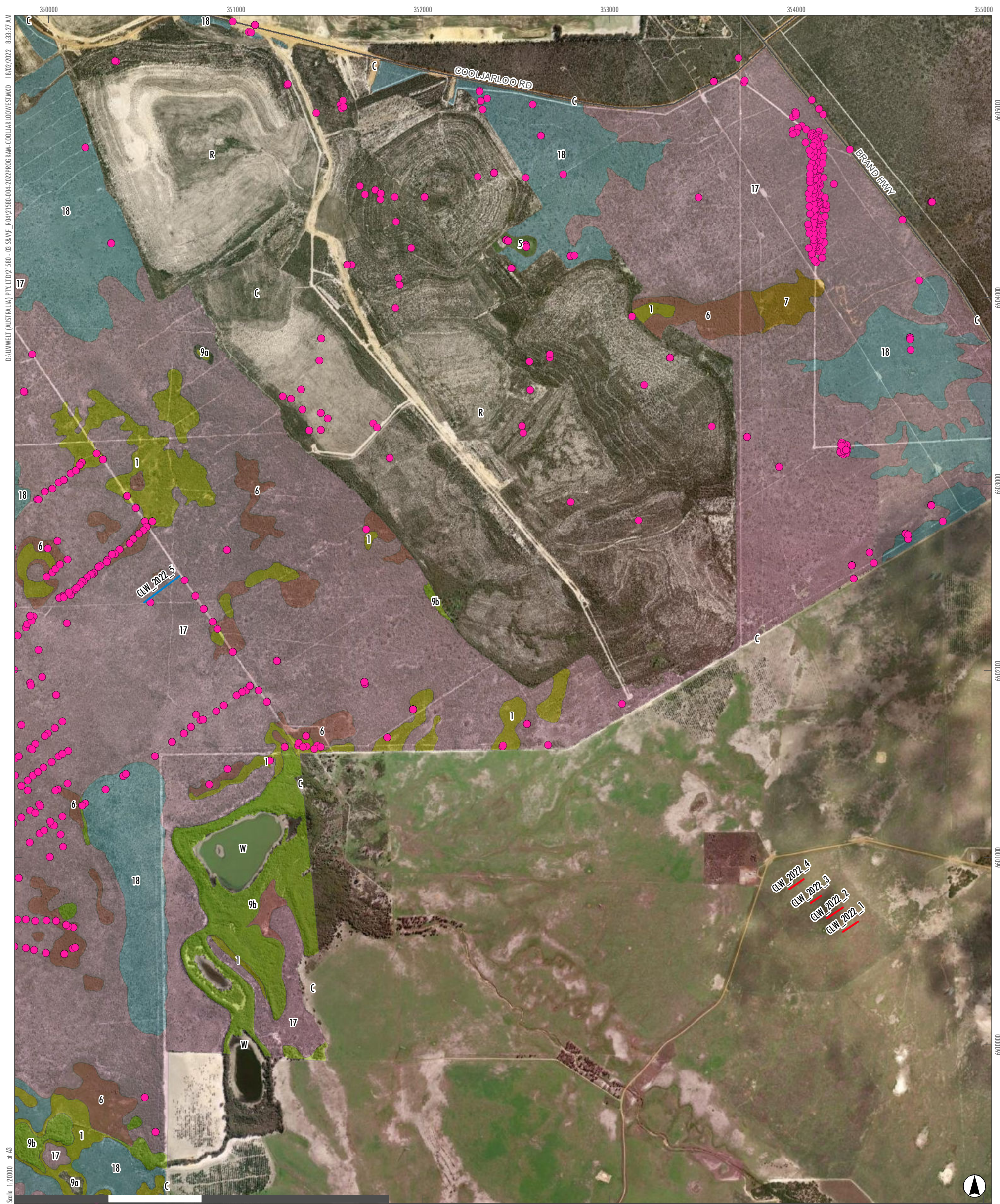
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- Legend**
- Proposed Drill Line - Survey Required
  - Proposed Drill Line - No Survey Required
  - Proposed Access - Survey Required
  - Existing Access
  - Significant Flora Location
  - Roads
- Vegetation Types**
- 1
  - 2
  - 5
  - 6
  - 7
  - 9a
  - 9b
  - 17
  - 18



FIGURE 4.1  
Sheet 2

2022 Exploration Drilling Program – Cooljarloo West  
– Drill Line and Access Track Survey Requirements



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- Legend**
- Proposed Drill Line - Survey Required
  - Proposed Drill Line - No Survey Required
  - Proposed Access - Survey Required
  - Existing Access
  - Significant Flora Location
  - Roads

- Vegetation Types**
- 1
  - 5
  - 6
  - 7
  - 9b
  - 17
  - 18

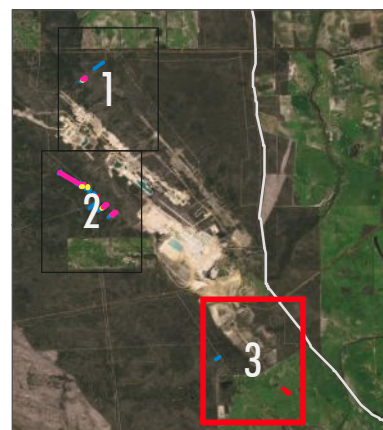


FIGURE 4.1

Sheet 3

2022 Exploration Drilling Program – Cooljarloo West  
– Drill Line and Access Track Survey Requirements



## 4.1.2 Cooljarloo North West/Jurien

### 4.1.2.1 Significant Flora

56 significant flora taxa are known to occur within the CNW/Jurien area; these are listed in **Table 4-3**. The assessment of likelihood and significance of impact did not identify any taxa that require targeted survey. The majority of taxa known to occur in the Jurien area are associated with the lateritic escarpment located to the north and east; such habitat is not known to occur in the Jurien area based on the results of previous surveys (Woodman Environmental 2016, 2017, 2018, 2019, 2021).

**Table 4-3: Survey Requirements for Significant Flora Taxa –Cooljarloo North West/Jurien**

Significant Flora Taxon	Status	Habitat, Proximity to Impact and Significance of Local Populations	Proposed Survey Requirements
<i>Acacia epacantha</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes clay soils over laterite in upland areas, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 9 km north-northeast of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Acacia plicata</i>	P3	<ul style="list-style-type: none"> <li>Habitat is usually rocky soils with Eucalyptus wandoo, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Known from a location in close proximity to proposed exploration, however location is represented by a historical WAHerb specimen with automatically generated coordinates based on a very broad locality description; coordinates are considered erroneous as they occur in a paddock.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Acacia retrorsa</i>	P2	<ul style="list-style-type: none"> <li>Habitat includes grey or brown sand and sandy loam with lateritic gravel in gullies or on slopes, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Known from a location in close proximity to proposed exploration, however location is represented by a historical WAHerb specimen with automatically generated coordinates based on a very broad locality description; coordinates are considered erroneous as they occur in a paddock.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Banksia chamaephyton</i>	P4	<ul style="list-style-type: none"> <li>Habitat includes grey or white sand over laterite on slopes or hilltops, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 10 km south-east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat, Proximity to Impact and Significance of Local Populations	Proposed Survey Requirements
<i>Banksia dallanneyi</i> subsp. <i>pollostata</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes grey or yellow sand on flats or slopes with laterite or limestone, as per WAHerb (1998-).</li> <li>Known locations in the general area (within 1 km) of proposed exploration, however requires verification as identification may be erroneous.</li> <li>Known from a number of regional locations over a wide distribution, local populations not of High significance to overall significance of taxon, any impacts on taxon therefore not likely to be significant.</li> <li>Nearest vouchered location approximately 60 km east of proposed exploration (DBCA 2007-).</li> </ul>	<b>No survey required for this taxon</b> - any local populations not of High significance to regional conservation status.
<i>Banksia fraseri</i> var. <i>crebra</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes grey or brown lateritic sandy clay on lateritic sandplains and low lateritic hills, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 5 km north of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Beaufortia bicolor</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes sandy soils over laterite in upland areas, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 10 km northeast of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Beyeria cinerea</i> subsp. <i>cinerea</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes brown or grey calcareous sand over limestone on slopes and hilltops, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 9 km west of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Centrolepis milleri</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes sandy soils on plains and in upland areas, as per WAHerb (1998-).</li> <li>Habitat unlikely to be impacted by proposed exploration.</li> <li>Nearest location approximately 10 km northeast of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat, Proximity to Impact and Significance of Local Populations	Proposed Survey Requirements
<i>Dampiera</i> sp. Jurien (G. Lullfitz s.n. 10/7/1986)	P2	<ul style="list-style-type: none"> <li>Habitat includes brown or yellow sand or sandy clay over limestone in open shrubland, as per WAHerb (1998-).</li> <li>Taxon only known from two locations, habitat information is scarce, but considered likely to be a near-coastal species.</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 5 km north of proposed exploration, however location is represented by a historical WAHerb specimen with the very broad locality description of 'Jurien'.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Dampiera tephrea</i>	P2	<ul style="list-style-type: none"> <li>Habitat as per WAHerb (1998-) variable, often near rivers or on limestone, occasionally laterite.</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 5 km west of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - unlikely to be impacted by proposed exploration.
<i>Drosera allantostigma</i>	P1	<ul style="list-style-type: none"> <li>Habitat includes sand or loam in low heath or along margins of winter-wet areas, as per WAHerb (1998-).</li> <li>Locations returned from database search are erroneous, not considered to occur in database search area.</li> </ul>	<b>No survey required for this taxon</b> - taxon considered highly unlikely to occur in the exploration area.
<i>Eucalyptus angularis</i>	P2	<ul style="list-style-type: none"> <li>Habitat includes slopes and breakaways of lateritic hills, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on results of previous surveys.</li> <li>Nearest location approximately 7 km north-east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Eucalyptus argutifolia</i>	Threatened (BC Act and EPBC Act)	<ul style="list-style-type: none"> <li>Is a listed Threatened taxon.</li> <li>Habitat includes white or grey shallow sand over limestone on limestone ridges, as per WAHerb (1998-).</li> <li>Nearest location approximately 5 km west of proposed exploration, however specimen has been determined as <i>Eucalyptus</i> aff. <i>argutifolia</i>, with nearest confirmed location of the taxon approximately 100 km to the south-southeast.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat, Proximity to Impact and Significance of Local Populations	Proposed Survey Requirements
<i>Eucalyptus xlateritica</i>	Threatened (BC Act and EPBC Act)	<ul style="list-style-type: none"> <li>• Is a listed Threatened taxon.</li> <li>• Habitat includes white or grey sand over laterite on breakaways and mesas, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 9 km northeast of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Eucalyptus leprophloia</i>	Threatened (BC Act and EPBC Act)	<ul style="list-style-type: none"> <li>• Is a listed Threatened taxon.</li> <li>• Habitat includes white or grey sand over laterite on valley slopes, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 10 km northeast of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i>	P4	<ul style="list-style-type: none"> <li>• Habitat includes white or grey sand over laterite on hills and plains, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 10 km north of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Eucalyptus pendens</i>	P4	<ul style="list-style-type: none"> <li>• Habitat includes sand over laterite on hilltops and breakaways, as per WAHerb (1998).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 9 km northeast of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat, Proximity to Impact and Significance of Local Populations	Proposed Survey Requirements
<i>Eucalyptus suberea</i>	Threatened (BC Act and EPBC Act)	<ul style="list-style-type: none"> <li>• Is a listed Threatened taxon.</li> <li>• Habitat includes white, grey or brown shallow sand over laterite on or near lateritic breakaways, as per WAHerb (1998).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 9 km east northeast of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Eucalyptus zopherophloia</i>	P4	<ul style="list-style-type: none"> <li>• Habitat includes grey or white calcareous sand over limestone on slopes, as per WAHerb (1998).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 10 km west of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - taxon considered unlikely to occur in the CNW/Jurien area.
<i>Grevillea humifusa</i>	Threatened (BC Act and EPBC Act)	<ul style="list-style-type: none"> <li>• Is a listed Threatened taxon.</li> <li>• Habitat includes brown gravelly loam over laterite on slopes, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 2 km northeast of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Grevillea olivacea</i>	P4	<ul style="list-style-type: none"> <li>• Habitat is coastal limestone, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 8 km northwest of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Grevillea rudis</i>	P4	<ul style="list-style-type: none"> <li>• Habitat includes white, grey, yellow or red sand, usually with gravel over laterite on hills, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 6 km southeast of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat, Proximity to Impact and Significance of Local Populations	Proposed Survey Requirements
<i>Grevillea saccata</i>	P4	<ul style="list-style-type: none"> <li>Habitat includes sand, usually with gravel and over laterite, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 7 km east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Grevillea</i> sp. Cooljarloo (B.J. Keighery 28 B)	P1	<ul style="list-style-type: none"> <li>Habitat includes grey or white sand or sandy clay in low flats and winter-wet areas, with nearest record occurring Eucalyptus wandoo woodland, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 10 km northeast of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Guichenotia alba</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes white or grey sand or clay with gravel over laterite, on flats or lower slopes, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 10 km west-northwest of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Haemodorum loratum</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes grey or yellow gravelly sand on low plains or slopes, as per WAHerb (1998-).</li> <li>Similar habitat to preferred habitat may be impacted by proposed exploration, however no locations recorded in previous surveys of habitat. Taxon may be confused with <i>Haemodorum venosum</i> in the absence of flowers.</li> <li>Known from many regional locations over a wide distribution, any local populations not of High significance to overall significance of taxon, any impacts on taxon therefore not likely to be significant.</li> <li>Nearest location approximately 5 km north of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - any local populations not of High significance to regional conservation status.

Significant Flora Taxon	Status	Habitat, Proximity to Impact and Significance of Local Populations	Proposed Survey Requirements
<i>Hakea megalosperma</i>	Threatened (BC Act and EPBC Act)	<ul style="list-style-type: none"> <li>• Is a listed Threatened taxon.</li> <li>• Habitat includes white or grey gravelly sand or loam over laterite on slopes and hilltops, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 8 km east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Hakea neurophylla</i>	P4	<ul style="list-style-type: none"> <li>• Habitat includes brown or brown gravelly sand or loam on slopes or lateritic hills, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 7 km east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Haloragis foliosa</i>	P3	<ul style="list-style-type: none"> <li>• Habitat includes white or grey sand over limestone, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 9 km west of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Hensmania stoniella</i>	P3	<ul style="list-style-type: none"> <li>• Habitat includes white, grey or lateritic sand, often in winter-wet areas, as per WAHerb (1998-).</li> <li>• Similar habitat to preferred habitat may be impacted by proposed exploration however no locations recorded in previous surveys of habitat.</li> <li>• Known from many regional locations over a wide distribution, any local populations not of High significance to overall significance of taxon, any impacts on taxon therefore not likely to be significant.</li> <li>• Nearest location approximately 2 km east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - any local populations not of High significance to regional conservation status.
<i>Hibbertia propinqua</i>	P4	<ul style="list-style-type: none"> <li>• Habitat includes grey, brown or yellow gravelly sand over laterite on breakaways and outcrops, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 9 km northeast of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.



Significant Flora Taxon	Status	Habitat, Proximity to Impact and Significance of Local Populations	Proposed Survey Requirements
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes sand or sandy clay on low flats and in winter-wet areas, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration.</li> <li>Known from a number of regional locations over a wide distribution, any local populations not of High significance to overall significance of taxon, any impacts on taxon therefore not likely to be significant.</li> <li>Nearest location approximately 0.5 km east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Lepyrodia curvescens</i>	P2	<ul style="list-style-type: none"> <li>Habitat includes grey sand or clay on slopes, flats or in winter-wet areas, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration.</li> <li>Nearest location approximately 4 km north of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - any local populations not of High significance to regional conservation status.
<i>Leucopogon foliosus</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes white to grey sand, yellow gravelly sand or brown loamy gravel over laterite, on slopes and upland areas of heath, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration.</li> <li>Nearest location approximately 8 km east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Patersonia argyrea</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes grey or brown sand or sandy clay with lateritic gravel on slopes and hilltops, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 8 km east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Persoonia rudis</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes white, yellow or grey sand, often over laterite, on flats or slopes, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Known from many regional locations over a wide distribution, local populations not of High significance to overall significance of taxon, any impacts on taxon therefore not likely to be significant.</li> <li>Nearest location approximately 2 km east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> – any local populations not of High significance to regional conservation status, habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat, Proximity to Impact and Significance of Local Populations	Proposed Survey Requirements
<i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes white or grey sand with lateritic gravel in upland areas, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 8 km east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Phlebocarya pilosissima</i> subsp. <i>teretifolia</i>	P2	<ul style="list-style-type: none"> <li>Habitat includes white, grey or brown sand over laterite or limestone in upland areas, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 3 km southeast of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Platysace ramosissima</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes yellow, brown or grey sandy soils on flats or low rises, as per WAHerb (1998-).</li> <li>Known from locations in the general area of proposed exploration (within 2 km), however requires verification as identification may be erroneous.</li> <li>Similar habitat to preferred habitat may be impacted by proposed exploration.</li> <li>Known from a number of regional locations over a wide distribution, any local populations not of High significance to overall significance of taxon, any impacts on taxon therefore not likely to be significant.</li> </ul>	<b>No survey required for this taxon</b> - any local populations not of High significance to regional conservation status.
<i>Schoenus griffinianus</i>	P4	<ul style="list-style-type: none"> <li>Habitat includes white or grey sand, sometimes associated with laterite, on flats or low plains, as per WAHerb (1998-).</li> <li>Known from locations in the general area (within 2 km) of proposed exploration.</li> <li>Similar habitat to preferred habitat may be impacted by proposed exploration.</li> <li>Known from many regional locations over a wide distribution, local populations not of High significance to overall significance of taxon, any impacts on taxon therefore not likely to be significant.</li> </ul>	<b>No survey required for this taxon</b> - any local populations not of High significance to regional conservation status.

Significant Flora Taxon	Status	Habitat, Proximity to Impact and Significance of Local Populations	Proposed Survey Requirements
<i>Stylidium hymenocraspedum</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes white or grey sand on plains and slopes, as per WAHerb (1998-).</li> <li>Known from locations in the general area of proposed exploration (within 2 km), however requires verification as identification may be erroneous.</li> <li>Similar habitat to preferred habitat may be impacted by proposed exploration.</li> <li>Known from a number of regional locations over a wide distribution, any local populations not of High significance to overall significance of taxon, any impacts on taxon therefore not likely to be significant.</li> <li>Nearest vouchered location approximately 13 km southeast of proposed exploration (DBCA 2007-).</li> </ul>	<b>No survey required for this taxon</b> - any local populations not of High significance to regional conservation status.
<i>Stylidium inversiflorum</i>	P4	<ul style="list-style-type: none"> <li>Habitat includes white or grey sand over laterite on plains or slopes, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> </ul> <p>Nearest location approximately 3 km north of proposed exploration.</p>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Stylidium maritimum</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes grey or brown calcareous sand or loam over limestone on slopes or ridges, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> </ul> <p>Nearest location approximately 10 km west-northwest of proposed exploration.</p>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Stylidium periscelianthum</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes winter-wet clay soils on flats and slopes of low hills (usually granitic), as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> </ul> <p>Nearest location approximately 2 km north-east of proposed exploration.</p>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat, Proximity to Impact and Significance of Local Populations	Proposed Survey Requirements
<i>Stylidium torticarpum</i>	P3	<ul style="list-style-type: none"> <li>• Habitat includes white, grey or brown sandy clay or clay loam over laterite on plains, slopes or near breakaways, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 2 km north of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Synaphea endothrix</i>	P3	<ul style="list-style-type: none"> <li>• Habitat includes gravelly loam or sand on lateritic rises, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 5 km east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Synaphea lesueurensis</i>	P2	<ul style="list-style-type: none"> <li>• Habitat includes grey or brown gravelly sand or loam over laterite on slopes, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 3 km north of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Synaphea xela</i>	P2	<ul style="list-style-type: none"> <li>• Habitat includes white or brown gravelly sand or loam over laterite on slopes, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 10 km east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Tetratheca angulata</i>	P3	<ul style="list-style-type: none"> <li>• Habitat includes white, grey or brown gravelly sand or loam over laterite on slopes or hilltops, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 10 km east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat, Proximity to Impact and Significance of Local Populations	Proposed Survey Requirements
<i>Thelymitra apiculata</i>	P4	<ul style="list-style-type: none"> <li>Habitat includes grey or brown sand with lateritic gravel on slopes, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 10 km north of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Thelymitra pulcherrima</i>	P2	<ul style="list-style-type: none"> <li>Habitat includes white, grey brown gravelly sand or sandy clay on low slopes, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 10 km north of proposed exploration (location is approximate being '3 miles south-west of Mount Lesueur', 1969 record (WAHerb 1998-).</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Thryptomene</i> sp. Lancelin (M.E. Trudgen 14000)	P3	<ul style="list-style-type: none"> <li>Habitat includes grey or white calcareous sand over limestone on slopes or hilltops, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 10 km south-west of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.
<i>Thysanotus anceps</i>	P3	<ul style="list-style-type: none"> <li>Habitat includes grey, white or brown gravelly sand or loam over laterite on slopes, as per WAHerb (1998-).</li> <li>Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>Nearest location approximately 10 km north-east of proposed exploration.</li> </ul>	<b>No survey required for this taxon</b> - habitat very unlikely to be impacted.

Significant Flora Taxon	Status	Habitat, Proximity to Impact and Significance of Local Populations	Proposed Survey Requirements
<i>Thysanotus glaucus</i>	P4	<ul style="list-style-type: none"> <li>• Habitat includes white, grey or yellow sand and sandy gravel on plains or slopes, as per WAHerb (1998-).</li> <li>• Similar habitat to preferred habitat may be impacted by proposed exploration.</li> <li>• Known from many regional locations over a wide distribution, any local populations not of High significance to overall significance of taxon, any impacts on taxon therefore not likely to be significant.</li> <li>• Nearest location approximately 5 km south-east of proposed exploration.</li> </ul>	<p><b>No survey required for this taxon</b> - any local populations not of High significance to regional conservation status.</p>
<i>Xanthosia tomentosa</i>	P4	<ul style="list-style-type: none"> <li>• Habitat includes white, grey or brown gravelly sand or clayey sand over laterite on plains or slopes, as per WAHerb (1998-).</li> <li>• Habitat very unlikely to occur in vicinity of exploration based on previous surveys.</li> <li>• Nearest location approximately 4 km north of proposed exploration.</li> </ul>	<p><b>No survey required for this taxon</b> - habitat very unlikely to be impacted.</p>

#### 4.1.2.2 Significant Vegetation and Wetlands

One location of a TEC as endorsed by the W.A. Minister for the Environment is known to occur with the CNW/Jurien area, being the Stromatolite community of stratified hypersaline coastal lakes TEC (Vulnerable – W.A.) (DBCA 2007-). This community is located east of Cervantes at Lake Thetis (DBCA 2012) with only the (extensive) buffer of the community intersecting the CNW/Jurien area rather than the community itself. No DBCA-classified PECs (excluding the ‘Banksia dominated woodlands of the Swan Coastal Plain’ PEC (P3), as discussed below), are known to occur within the CNW/Jurien area (DBCA 2007-). A review of the most recent lists of such TECs and PECs indicates that no new communities have been listed as either TECs or PECs that could occur in the Jurien area.

The search of the DAWE’s SPRAT database for the Jurien area (DAWE 2021b) identified that the ‘Banksia Woodlands of the Swan Coastal Plain’ TEC (Endangered) and the Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain TEC (Critically Endangered) are likely to occur in the CNW/Jurien area.

Previous observations by Woodman Environmental (2015a; 2016; 2017, 2018, 2019) indicate that the Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain TEC (Critically Endangered) does not occur within the CNW/Jurien area. Tuart itself has never been observed within the vicinity of the 2022 exploration drilling program and is highly unlikely to occur in the CNW/Jurien area generally; the known records of this species in the general vicinity of the CNW/Jurien area are generally much closer to the coast than the CNW/Jurien area. It is therefore considered that this community will not be impacted by the 2022 exploration drilling program.

Based on the key diagnostic characteristics (TSSC 2016), and previous observations by Woodman Environmental (2015a; 2016; 2017, 2018, 2019) it is considered that the ‘Banksia Woodlands of the Swan Coastal Plain’ TEC occurs within the CNW/Jurien area. This TEC is considered to be widespread in the CNW/Jurien area based on previous observations by Woodman Environmental and can be delineated using a combination of aerial photography and previous field observations. Such investigation during the desktop assessment indicated that this TEC will be intersected by the 2022 exploration drilling program and that it is not possible to deviate around occurrences.

While the occurrence of this TEC can be delineated via desktop mapping in areas where previous vegetation observations have been recorded, field survey to record further field observations is considered desirable for accurate delineation along drill lines and access tracks which are located in areas not previously visited. These lines are detailed in **Section 4.1.2.4 (Table 4-4)**.

Detailed vegetation mapping is not available for the CNW/Jurien area. However, survey by Woodman Environmental (2015a) in 2014 recorded six ridges that appear to be composed of ferricrete (‘ironstone’). Plant assemblages on ferricrete soils in the south-west of W.A. are considered to be of high conservation significance, with a number listed as TECs, at both state and federal level. These areas are relatively identifiable on aerial photography, consisting of narrow expressions of iron-stained soil. A review of aerial photography and previous field observations indicates that one area will potentially be intersected by the 2022 exploration drilling program (CNW\_2022\_10), and therefore survey is considered to be required to assess the possibility of a deviation around this area.

A review of aerial photography and previous field observations indicates that two areas that represent large wetlands are intersected by the 2022 exploration drilling program along CNW\_2022\_10); survey is considered to be required to assess possible deviations around these wetlands.

The 2022 exploration drilling program intersects remnant vegetation in two vegetation system associations as defined by Shepherd et al. (2002), being Jurien 1029 and Bassendean 1030. As these vegetation system associations have 69.1 and 71.7 % of their pre-European extents remaining (Government of Western Australia 2019), and the 2022 exploration drilling program will only temporarily reduce their extents by a small amount, no field survey with regard to vegetation system associations is considered to be required.

#### **4.1.2.3 Other Environmental Values**

Several drill lines and access tracks do not require survey as they have either recently been surveyed by Woodman Environmental, or have had observations made recently by Woodman Environmental in the immediate vicinity, so that the vegetation can be confidently determined as being or not being the 'Banksia Woodlands of the Swan Coastal Plain' TEC.

Several drill lines and access tracks do not require survey, as they are located within cleared paddocks.

The 2022 exploration drilling program does not intersect any conservation reserves or DBCA Clearing Regulations Environmentally Sensitive Areas (ESAs) (DBCA 2011).

#### **4.1.2.4 Drill Lines Requiring Survey**

**Table 4-4** summarises the findings of the desktop assessment of proposed drill lines and access tracks, and the requirement for any survey along such drill lines and access tracks. A total of 0.2 km of proposed access tracks and 1.4 km of proposed drill lines (total distance 1.6 km) are considered to require survey at CNW/Jurien (**Figure 4-2**). However, survey is only required to identify occurrences of the TEC 'Banksia Woodlands of the Swan Coastal Plain', significant wetlands and ferricrete ('ironstone') ridges; the drill lines do not require searching for significant flora. Consequently, those drill lines and access tracks requiring survey may not need to be surveyed in their entirety if the extent of the above communities can be determined via aerial photography in combination with field observations; such lines and access tracks may also not be flagged if deviations around these communities are not possible.



**Table 4-4: Cooljarloo North West/Jurien Drill Line and Proposed Access Survey Requirements**

Line/Access	Survey Requirement	Reasoning	Comments
CNW_2022_1	No	Proposed deviation results in entire line being located in cleared paddock	
CNW_2022_1_Deviation	No	Located in cleared paddock	
CNW_2022_2	Yes	Vegetation not assessed during previous surveys, may intersect Banksia Woodlands TEC	
CNW_2022_3	Yes	Vegetation not assessed during previous surveys, may intersect Banksia Woodlands TEC	
CNW_2022_4	Yes	Vegetation not assessed during previous surveys, may intersect Banksia Woodlands TEC	
CNW_2022_4_Access	Yes	Vegetation not assessed during previous surveys, may intersect Banksia Woodlands TEC	Created by Umwelt
CNW_2022_5	No	Vegetation assessed during previous surveys	
CNW_2022_5_Access	No	Vegetation assessed during previous surveys	Created by Umwelt
CNW_2022_6	Yes	Vegetation not assessed during previous surveys, may intersect Banksia Woodlands TEC	
CNW_2022_6_Access	Yes	Vegetation not assessed during previous surveys, may intersect Banksia Woodlands TEC	Created by Umwelt
CNW_2022_7	No	Vegetation assessed during previous surveys	
CNW_2022_8	No	Vegetation assessed during previous surveys	
CNW_2022_7-8_Access	No	Vegetation assessed during previous surveys	Created by Umwelt
CNW_2022_9	No	Located in highly degraded vegetation that has been assessed during previous surveys	
CNW_2022_10	Yes	Intersects wetland areas and potentially a ferricrete ridge, deviations may be required	
CNW_2022_11	No	Located in cleared paddock	
CNW_2022_12	No	Located in cleared paddock	

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- Legend**
- Proposed Drill Line - Survey Required
  - Proposed Drill Line - No Survey Required
  - Proposed Access - Survey Required
  - Proposed Access - No Survey Required
  - Existing Access
  - Significant Flora Location
  - Roads



FIGURE 4.2  
Sheet 1

**2022 Exploration Drilling Program –  
Cooljarloo North West / Jurien – Drill Line  
and Access Track Survey Requirements**

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Scale: 1:20000 at A3

0 1 2 Kilometers

GDA2020 MGA Zone 50

- Legend**
- Proposed Drill Line - Survey Required
  - Proposed Drill Line - No Survey Required
  - Proposed Access - Survey Required
  - Proposed Access - No Survey Required
  - Existing Access
  - Significant Flora Location
  - Roads



FIGURE 4.2

Sheet 2

2022 Exploration Drilling Program –  
Cooljarloo North West / Jurien – Drill Line  
and Access Track Survey Requirements

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324000 325000 326000 327000 328000



- Legend**
- Proposed Drill Line - Survey Required
  - Proposed Drill Line - No Survey Required
  - Proposed Access - Survey Required
  - Proposed Access - No Survey Required
  - Existing Access
  - Significant Flora Location
  - Roads

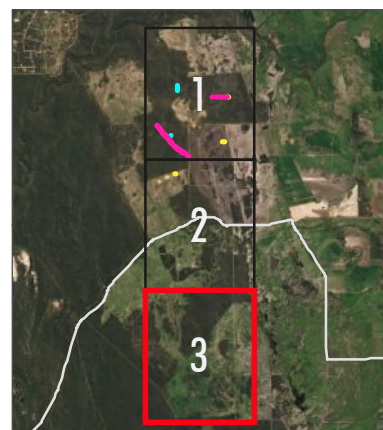


FIGURE 4.2

Sheet 3

2022 Exploration Drilling Program –  
Cooljarloo North West / Jurien – Drill Line  
and Access Track Survey Requirements

## 4.2 Field Survey

### 4.2.1 Cooljarloo West

#### 4.2.1.1 Significant Flora

A total of 11 significant flora taxa were recorded during the field survey of the 2022 exploration drilling program at CLW; these are listed in **Table 4-5**, along with the drill lines or access tracks they were recorded on. All are DBCA-classified Priority flora taxa. All except *Poranthera asybosca* (P1) have previously been recorded in the CLW Study Area. One taxon, *Schoenus pennisetis* (P3), was not recorded during survey of any of the proposed drill lines or access tracks; this taxon was located on an existing drill line just north of line CLW\_2022\_19 while returning to the vehicle following completion of the survey of line CLW\_2022\_19.

The locations of the significant flora recorded are presented on **Figure 4-3**. Appendix C presents the point locations and number of individuals for all significant flora taxa recorded during the field survey.

Appendix D presents TPFRFs to be submitted to DBCA for these records.

**Table 4-5: Significant Flora Taxa Recorded by the Field Survey at Cooljarloo West**

Significant Flora Taxon	Conservation Status	No. of Point Locations Recorded	No. of Individuals Recorded	Drill Line / Access Track Recorded
<i>Arnocrinum gracillimum</i>	P3	13	19	CLW_22_22
<i>Babingtonia urbana</i>	P3	9	55	CLW_22_07 CLW_22_08
<i>Beaufortia bicolor</i>	P3	33	306	CLW_22_22
<i>Chordifex reseminans</i>	P2	21	79	CLW_22_07 CLW_22_08 CLW_22_10 CLW_22_15 CLW_22_18 CLW_22_19
<i>Conostephium magnum</i>	P4	13	113	CLW_22_05
<i>Grevillea</i> sp. Cooljarloo (B.J. Keighery 28 B)	P1	3	9	CLW_22_14
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	12	15	CLW_22_06 CLW_22_07 CLW_22_17 CLW_22_20 CLW_22_21 CLW_22_21
<i>Poranthera asybosca</i>	P1	2	60	CLW_22_20 CLW_22_21
<i>Schoenus pennisetis</i>	P4	1	1	NA
<i>Stylidium hymanocraspedum</i>	P3	3	11	CLW_22_22
<i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>	P4	4	6	CLW_22_18 CLW_22_19 CLW_22_20

*Poranthera asybosca* (P1) was recorded opportunistically at a total of two point locations (60 plants) during the survey; single locations were recorded along the proposed alignments for CLW\_22\_20 (30 plants) and CLW\_22\_21 (30 plants). This taxon has not previously been recorded from CLW, and is only known to occur further north at Lesueur National Park and Eneabba; consequently, it was not a target taxon during this survey (as listed in **Table 4-1**). The recorded locations were both in areas of Banksia woodland mapped as VT 17. Although there are still only limited locations of this taxon known in the CLW Study Area, the results of this current survey indicate that VT 17 may represent the preferred habitat of this species; as VT 18 is closely related to VT 17, this VT may also represent preferred habitat.

Based on DBCA records, *Poranthera asybosca* (P1) is known from a single population just north of Eneabba (WA Herbarium 1998-). However, the protologue for this species (Barrett and Barrett 2015) cites a second record held by the WA Herbarium that represents a second population, which is known to be in Lesueur National Park; it is unclear as to why the second record is not visible in the WA Herbarium specimen database, as a WA Herbarium specimen number is cited in the protologue. Using the rating scale in **Table 3-1**, the local populations of this species are rated of High significance. It is worthy of note, however, that Umwelt have recently recorded this species in the Tronox Dongara Study Area, and several areas between Eneabba and Jurien (reports currently in preparation). Additionally, although targeted survey is required to provide a better indication of the distribution and abundance of this species in the CLW Study Area, the recording of this species in a common, widespread VT by this current survey provides some indication that this species may potentially be somewhat common and widespread in the CLW Study Area.

It is considered likely that the current paucity of records of this taxon is due to its very small, cryptic nature, its superficial similarity to the common and widespread *Poranthera microphylla*, its relatively recent recognition as a distinct taxon (Barrett and Barrett 2015), and the lack of targeted survey across its range, rather than actual rarity. This has been demonstrated for another diminutive, cryptic *Poranthera* species *Poranthera moorokatta* (P2) that has been relatively recently described; upon description in 2012 (Barrett 2012), this taxon was only known to occur in two areas in the Perth metropolitan area; it has now been located as far south as Busselton (Woodman Environmental field observations), and as far north as Muechea (WA Herbarium 1998-); this species has recently been recorded in Tronox's Cooljarloo mine rehabilitation by Umwelt (report in preparation), further extending its known range northwards.

As *Poranthera asybosca* (P1) was not identified until after field survey, no flagging or deviations were established to avoid the locations of individuals. However, as it is an annual species, it is unlikely that it will be directly impacted by the proposed drilling, provided activities occur outside of the period when plants will be present (May to December). This is discussed further in **Section 4.3.1**.

As mentioned previously, the timing of the survey did not coincide with flowering period of *Caladenia denticulata* subsp. *albicans* (P1) and *Thelymitra pulcherrima* (P2), the only time that these taxa can be positively identified. Although these taxa could tentatively be identified in fruit, no such individuals were located during the survey; however, plants that did not produce fruit may not have been visible by the time of the survey. Numerous drill lines of the 2022 exploration drilling program intersect the known preferred habitat of *Thelymitra pulcherrima* (VT 1), and the potential preferred habitat of *Caladenia denticulata* subsp. *albicans* (VT 17). Further discussion of potential impacts to these taxa is presented in **Section 4.3.1.1**.

#### 4.2.1.2 Significant Vegetation and Wetlands

As outlined in **Section 4.1.1.2**, the EPBC-listed TEC ‘Banksia Woodlands of the Swan Coastal Plain’ (Endangered) is considered to occur at CLW. With specific regard to the 2022 exploration drilling program, this TEC is represented by VTs 17 and 18, as well as a single polygon of VT 6, as defined by Woodman Environmental (2014a). Field survey confirmed that polygons of these VTs with regard to the 2022 exploration drilling program were relatively accurate. This TEC is therefore considered to occur along the following drill lines and access tracks, which occur within these VTs:

- CLW\_2022\_5
- CLW\_2022\_6 and access
- CLW\_2022\_7 and access
- CLW\_2022\_8
- CLW\_2022\_11
- CLW\_2022\_12
- CLW\_2022\_13 and access
- CLW\_2022\_16
- CLW\_2022\_17
- CLW\_2022\_20
- CLW\_2022\_21 and access
- CLW\_2022\_22.

The description of VT 6 indicates that some occurrences of this VT could also represent the ‘Banksia Woodlands of the Swan Coastal Plain’ TEC. Of the two polygons of this VT intersected by the 2022 exploration drilling program, one polygon (intersected by CLW\_2022\_7) was considered to represent the TEC, as it contained a woodland stratum of Banksia species (*B. attenuata* and *B. menziesii*). The remaining polygon did not meet the diagnostic criteria for this TEC (no woodland stratum of Banksia species was present, vegetation was a mid to low shrubland dominated by *Banksia sessilis* and *Calothamnus quadrifidus*).

All vegetation considered to meet the key diagnostic characteristics for this TEC was considered to be in Good or better condition, which satisfies the condition thresholds for this TEC (Threatened Species Scientific Committee 2016). Although specific definition of patches of this TEC intersected by the 2022 exploration drilling program is beyond the scope of this assessment, the existing vegetation mapping (Woodman Environmental (2014a), in combination with field observations, indicates that all occurrences intersected are part of large areas of Banksia woodland in similar condition. All occurrences intersected are therefore considered to represent patches that meet the patch size threshold for the TEC (Threatened Species Scientific Committee 2016).

The location of this TEC in the context of the 2022 exploration drilling program is displayed on **Figure 4-3**. Further details are provided in **Table 4-6 (Section 4.2.1.4)**, with potential impacts discussed in **Section 4.3.3**.

As mentioned in **Section 4.1.1.2**, as this TEC is widespread within the CLW Study Area and occurs in large polygons, it is not possible to deviate around it, and therefore no deviations were established.

The significant vegetation communities VT 6 and VT 9b are intersected by the 2022 exploration drilling program. Both are intersected by multiple proposed drill lines and access tracks. As for the 'Banksia Woodlands of the Swan Coastal Plain' TEC, deviations around the polygons of these VTs were not possible, as most of the polygons were relatively large, and the spatial distribution precluded deviations from being established. Potential impacts to these VTs are discussed in **Section 4.3.1.2**.

As mentioned in **Section 4.1.1.2**, several VTs that occur exclusively in areas defined as wetlands are intersected by the 2022 exploration drilling program (**Figure 4-3**). All wetlands intersected are likely to be seasonally moist only, with surface water generally unlikely to be present. Impacts on these wetlands from the 2022 exploration drilling program are therefore considered unlikely to be significant. No other wetlands considered to be significant were recorded by the survey.

All vegetation intersected was considered to be in Very Good or better condition as per the vegetation condition scale presented in EPA (2016a) (as adapted from Keighery (1994)).

#### **4.2.1.3 Other Environmental Values**

Other relevant environmental values noted by the field survey include:

- The eastern end of CLW\_2022\_12 was deviated slightly (~10 m north) to utilise an existing, cleared firebreak for as long as possible until the proposed alignment left the firebreak
- No significant fauna habitat was identified that is at risk of being impacted by the 2022 exploration drilling program, including trees considered suitable roosting or nesting habitat for Carnaby's Cockatoo. However, the majority of the vegetation is considered to be foraging habitat for this species
- The 2022 exploration drilling program is unlikely to cause any impacts on surface or ground water hydrology, with no surface water present at the time of survey
- Centrelines were diverted around large trees and other slow-growing taxa whenever possible, however no significant deviations were established to avoid such taxa.

#### **4.2.1.4 Values of Individual Drill Lines and Access Tracks**

Relevant environmental values for each individual drill line and access track are presented in **Table 4-6**, including soils and general vegetation characteristics. Note that only drill lines and access tracks proposed for survey in **Section 4.1.1.4** are included in **Table 4-6**. For VT descriptions, refer to Appendix B. The surveyed centrelines for each drill line are presented on **Figure 4-3**.



**Table 4-6: Cooljarloo West Drill Line and Access Track Survey Outcomes**

Line/Access	Survey Requirement	Comments
CLW_2022_5	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 17</li> <li>• VT 17 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dryland plain.</li> <li>• Soil is white-grey sand, dry.</li> </ul>
CLW_2022_6	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 1 (south-west section) and 17 (far north-east end).</li> <li>• VT 17 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dryland plain for VT 17 section, and minor depression for VT 1 section which may be damp in winter.</li> <li>• Soil is white grey to grey brown sand, sandy loam or sandy clay, dry.</li> </ul>
CLW_2022_6_Access	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 17.</li> <li>• VT 17 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dryland plain.</li> <li>• Soil is white grey sand, dry.</li> </ul>
CLW_2022_7	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 1, 6 and 17.</li> <li>• VT 6 and VT 17 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dryland plain for VT 6 and VT 17 sections, and minor depression for VT 1 section which may be damp in winter.</li> <li>• Soil is white grey to grey brown sand, sandy loam or sandy clay, dry.</li> </ul>
CLW_2022_7_Access	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 1.</li> <li>• Habitat is minor depression which may be damp in winter.</li> </ul>

Line/Access	Survey Requirement	Comments
CLW_2022_8	Whole line required survey	<ul style="list-style-type: none"> <li>• Soil is white-grey to grey-brown sand, sandy loam or sandy clay, dry.</li> <li>• Entire line in remnant vegetation (except where firebreaks crossed), flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 1 (north-east section) and 17 (south-west section).</li> <li>• VT 17 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dryland plain for VT 17 section, and minor depression for VT 1 section which may be damp in winter.</li> <li>• Soil is white grey to grey brown sand, sandy loam or sandy clay, dry.</li> </ul>
CLW_2022_10	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 1.</li> <li>• Habitat is minor depression which may be damp in winter.</li> <li>• Soil is white-grey to grey-brown sand, sandy loam or sandy clay, dry.</li> </ul>
CLW_2022_11	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 1 and 18.</li> <li>• VT 18 is considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dryland plain for VT 18 sections, minor depression for VT 1 sections which may be damp in winter.</li> <li>• Soil is white grey to grey brown sand, sandy loam or sandy clay, dry.</li> </ul>
CLW_2022_12	Whole line required survey	<ul style="list-style-type: none"> <li>• North-east section of line on existing, well-used firebreak, flagged sparingly; remainder of line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 17 and 18</li> <li>• VTs 17 and 18 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dryland plain.</li> <li>• Soil is white-grey sand, dry.</li> </ul>
CLW_2022_13	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 1 (south-west section) and 17 (north-east section).</li> <li>• VT 17 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> </ul>

Line/Access	Survey Requirement	Comments
		<ul style="list-style-type: none"> <li>Habitat is dryland plain for VT 17 section, and minor depression for VT 1 section which may be damp in winter.</li> <li>Soil is white grey to grey brown sand, sandy loam or sandy clay, dry.</li> </ul>
<b>CLW_2022_13_Access</b>	Whole line required survey	<ul style="list-style-type: none"> <li>Entire line in remnant vegetation, flagged.</li> <li>Vegetation healthy, no disturbances.</li> <li>Vegetation is VT 17.</li> <li>VT 17 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>Habitat is dryland plain.</li> <li>Soil is white grey sand, dry.</li> </ul>
<b>CLW_2022_14</b>	Whole line required survey	<ul style="list-style-type: none"> <li>Entire line in remnant vegetation, flagged.</li> <li>Vegetation healthy, no disturbances.</li> <li>Vegetation is VT 1, 6 and 9b.</li> <li>VT 6 and 9b are considered to be significant vegetation.</li> <li>Habitat is minor depression for VT 1 section, rocky laterite ridge for VT 6 section, and moderate depression for VT 9b section, all of which may be damp in winter.</li> <li>Soil is white grey to grey brown or orange sand, sandy loam or sandy clay, grey to grey black sand, sandy loam, sandy clay or clayey sand, dry.</li> </ul>
<b>CLW_2022_14_Access</b>	Whole line required survey	<ul style="list-style-type: none"> <li>Entire line in remnant vegetation, flagged.</li> <li>Vegetation healthy, no disturbances.</li> <li>Vegetation is VT 1 (north-west section) and 9b (south-east section).</li> <li>VT 9b is considered to be significant vegetation.</li> <li>Habitat is minor depression for VT 1 section, and moderate depression for VT 9b section, both of which may be damp in winter.</li> <li>Soil is white grey to grey brown sand, sandy loam or sandy clay, grey to grey black sand, sandy loam, sandy clay or clayey sand, dry.</li> </ul>

Line/Access	Survey Requirement	Comments
CLW_2022_15	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 1, 6 and 17.</li> <li>• VT 17 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is minor depression, which may be damp in winter for VT 1 section, rocky laterite ridge for VT 6 section, and dryland plain for VT 17 section.</li> <li>• Soil is white grey to grey brown or orange sand, sandy loam or sandy clay, dry.</li> </ul>
CLW_2022_16	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 1, 6 and 17.</li> <li>• VT 6 is considered to be significant vegetation.</li> <li>• VT 17 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is minor depression, which may be damp in winter for VT 1 section, rocky laterite ridge for VT 6 section, and dryland plain for VT 17 section.</li> <li>• Soil is white grey to grey-brown or orange sand, sandy loam or sandy clay, dry.</li> </ul>
CLW_2022_17	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 6 (far north-eastern end) and 17 (remained of line)</li> <li>• VT 6 is considered to be significant vegetation.</li> <li>• VT 17 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dryland plain for VT 17 section, and sandy slope of laterite ridge for VT 6 section.</li> <li>• Soil is white grey to grey brown sand, dry.</li> </ul>
CLW_2022_18	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 1 and 5.</li> <li>• Habitat is minor depression, which may be damp in winter</li> <li>• Soil is white-grey to grey-brown sand, sandy loam, sandy clay or clay loam, dry.</li> </ul>

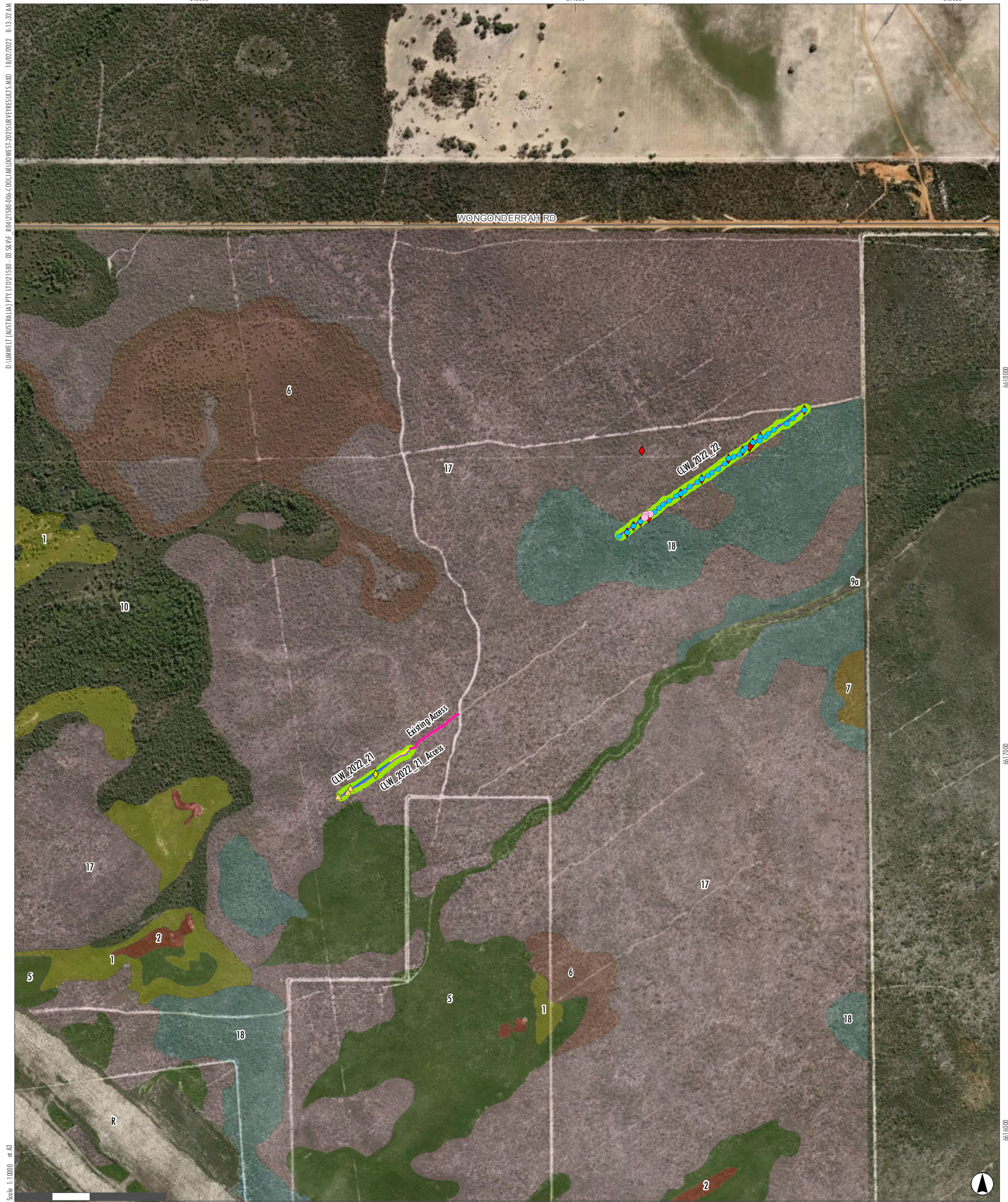
Line/Access	Survey Requirement	Comments
<b>CLW_2022_19</b>	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 1 and 5.</li> <li>• Habitat is minor depression, which may be damp in winter</li> <li>• Soil is white-grey to grey-brown sand, sandy loam, sandy clay or clay loam, dry.</li> </ul>
<b>CLW_2022_20</b>	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 1 (south-west section) and 17 (north-east section).</li> <li>• VT 17 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dryland plain for VT 17 section, and minor depression for VT 1 section which may be damp in winter.</li> <li>• Soil is white grey to grey brown sand, sandy loam or sandy clay, dry.</li> </ul>
<b>CLW_2022_21</b>	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 17.</li> <li>• VT 17 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dryland plain.</li> <li>• Soil is white or grey sand, dry.</li> </ul>
<b>CLW_2022_21_Access</b>	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 17.</li> <li>• VT 17 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dryland plain.</li> <li>• Soil is white or grey sand, dry.</li> </ul>
<b>CLW_2022_22</b>	Whole line required survey	<ul style="list-style-type: none"> <li>• Entire line in remnant vegetation, flagged.</li> <li>• Vegetation healthy, no disturbances.</li> <li>• Vegetation is VT 17 and 18.</li> <li>• VT 17 and 18 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dryland plain.</li> <li>• Soil is white grey to grey brown sand, sandy loam or sandy clay loam, dry.</li> </ul>

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GDA2020 MGA Zone 50

**Legend**

- Surveyed Centrelines (2022)
- Proposed Drill Line - Survey Required
- Proposed Drill Line - No Survey Required
- Proposed Access - Survey Required
- Existing Access
- TEC Occurrences 2022
- Wetlands 2022
- Roads

- Vegetation Types**
- 1
  - 2
  - 5
  - 6
  - 7
  - 17
  - 18

- Significant Flora (2021)**
- ◆ *Amocinum gracillimum* (P3)
  - *Beaufortia bicolor* (P3)
  - ▲ *Isopogon panduratus* subsp. *palustris* (P3)
  - ◆ *Poranthera asybosca* (P1);
  - *Stylidium hymenocraspedum* (P3)

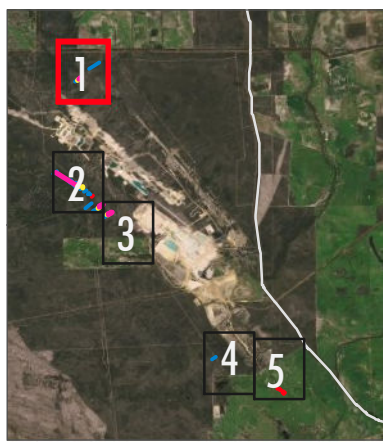
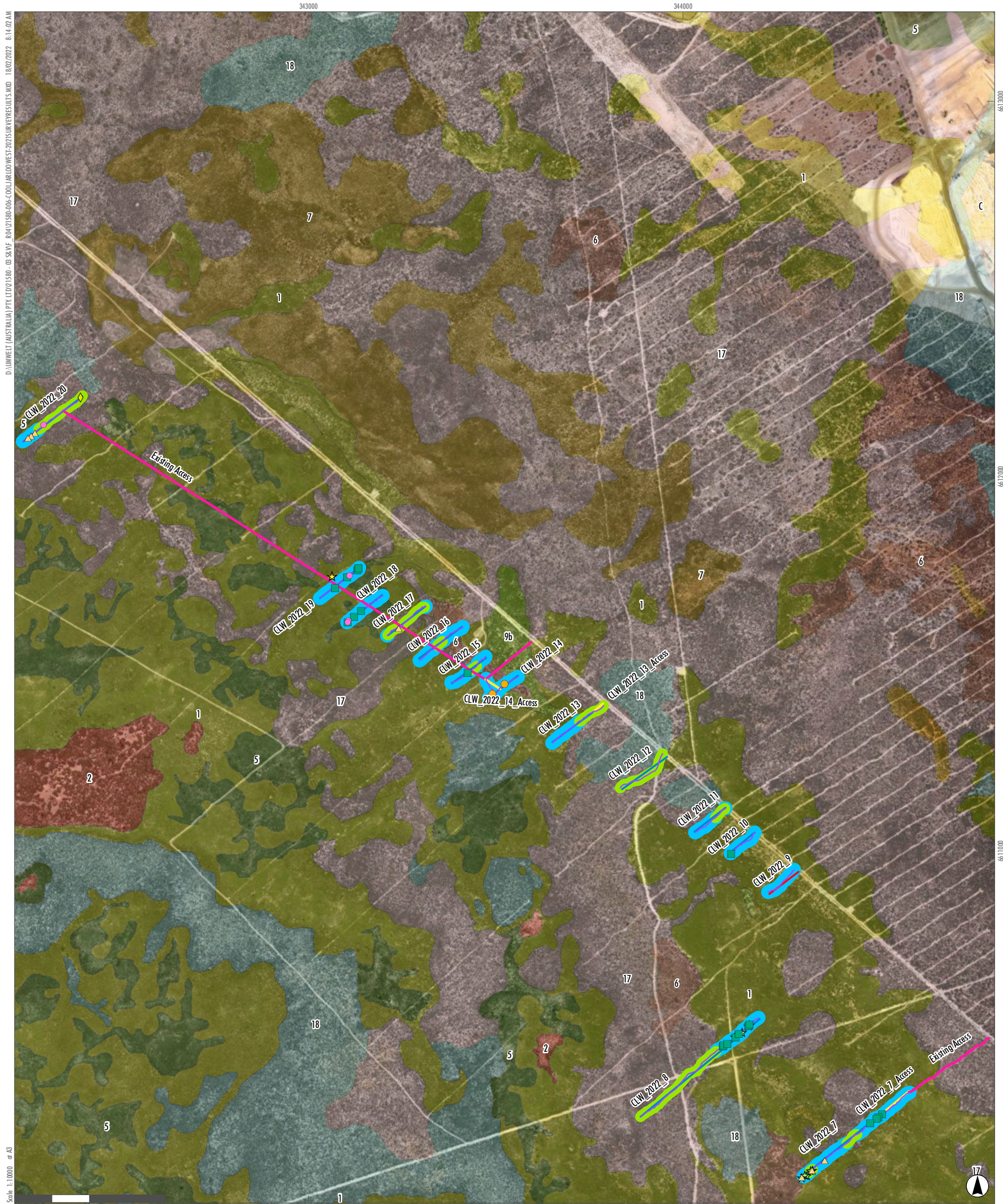


FIGURE 4.3

Sheet 1

2022 Exploration Drilling Program –  
Cooljarloo West – 2021 Survey Results



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- Legend**
- Surveyed Centrelines (2022)
  - Proposed Drill Line - Survey Required
  - Proposed Drill Line - No Survey Required
  - Proposed Access - Survey Required
  - Existing Access
  - TEC Occurrences 2022
  - Wetlands 2022
  - Roads
- Vegetation Types**
- 1
  - 2
  - 5
  - 6
  - 7
  - 9b
  - 17
  - 18
- Significant Flora (2021)**
- ★ *Babingtonia urbana* (P3)
  - *Chordifex reseminans* (P2)
  - *Grevillea* sp. Cooljarloo (B.J. Keighery 28 B) (P1)
  - ▲ *Isopogon panduratus* subsp. *palustris* (P3)
  - ◆ *Paranthera asybosca* (P1);
  - ★ *Schoenus pennisetis* (P4)
  - *Verticordia lindleyi* subsp. *lindleyi* (P4)

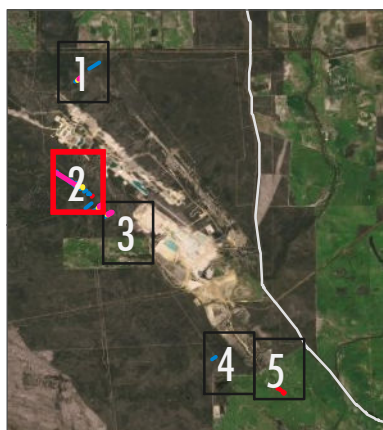
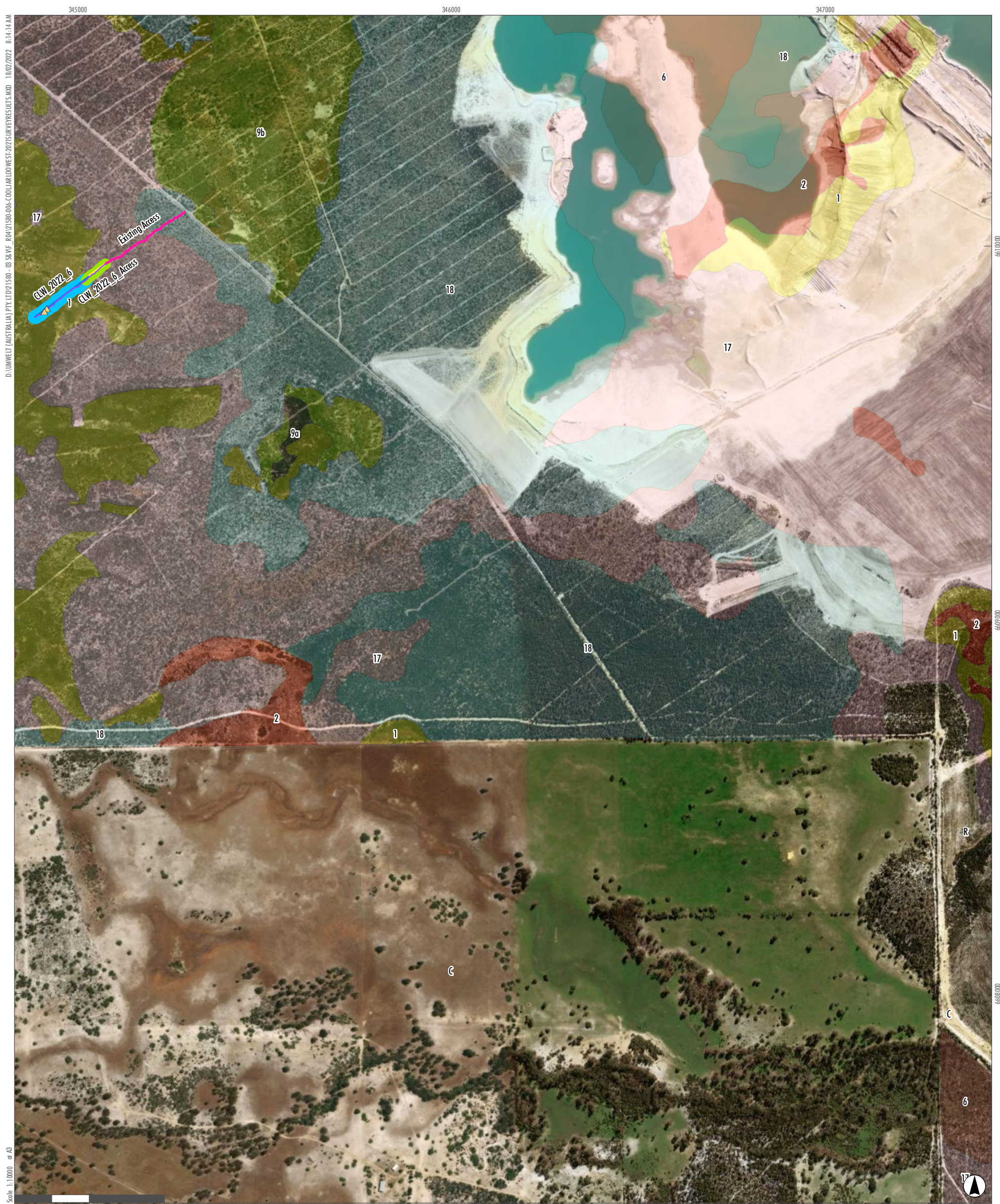


FIGURE 4.3

Sheet 2

2022 Exploration Drilling Program – Cooljarloo West – 2021 Survey Results



Legend		Vegetation Types	Significant Flora (2021)
	Surveyed Centrelines (2022)		<i>Isopogon panduratus</i> subsp. <i>palustris</i> (P3)
	Proposed Drill Line - Survey Required		
	Proposed Drill Line - No Survey Required		
	Proposed Access - Survey Required		
	Existing Access		
	TEC Occurrences 2022		
	Wetlands 2022		
	Roads		

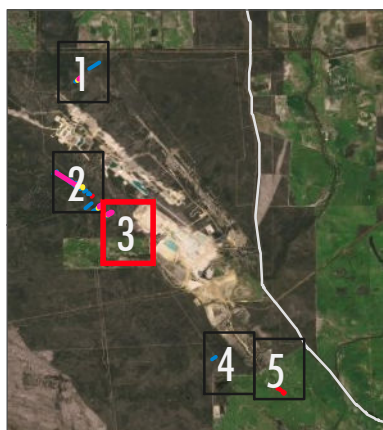


FIGURE 4.3

Sheet 3

2022 Exploration Drilling Program –  
Cooljarloo West – 2021 Survey Results





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Scale: 1:10000 at A3

GDA2020 MGA Zone 50

- Legend**
- Surveyed Centrelines (2022)
  - Proposed Drill Line - Survey Required
  - Proposed Drill Line - No Survey Required
  - Proposed Access - Survey Required
  - Existing Access
  - TEC Occurrences 2022
  - Wetlands 2022
  - Roads
- |  |   |
|--|---|
| <b>Vegetation Types</b>  | <b>Significant Flora (2021)</b>                                     |
| <span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 15px;"></span> 1   | <span style="color: cyan;">●</span> <i>Conostephium magnum</i> (P4) |
| <span style="background-color: #f4a460; border: 1px solid black; display: inline-block; width: 15px; height: 15px;"></span> 6  |   |
| <span style="background-color: #90ee90; border: 1px solid black; display: inline-block; width: 15px; height: 15px;"></span> 9b |   |
| <span style="background-color: #e0e0e0; border: 1px solid black; display: inline-block; width: 15px; height: 15px;"></span> 17 |   |
| <span style="background-color: #add8e6; border: 1px solid black; display: inline-block; width: 15px; height: 15px;"></span> 18 |   |

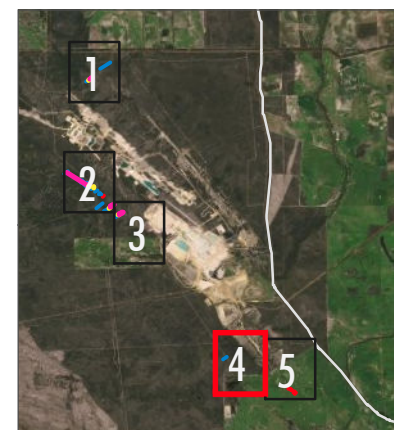
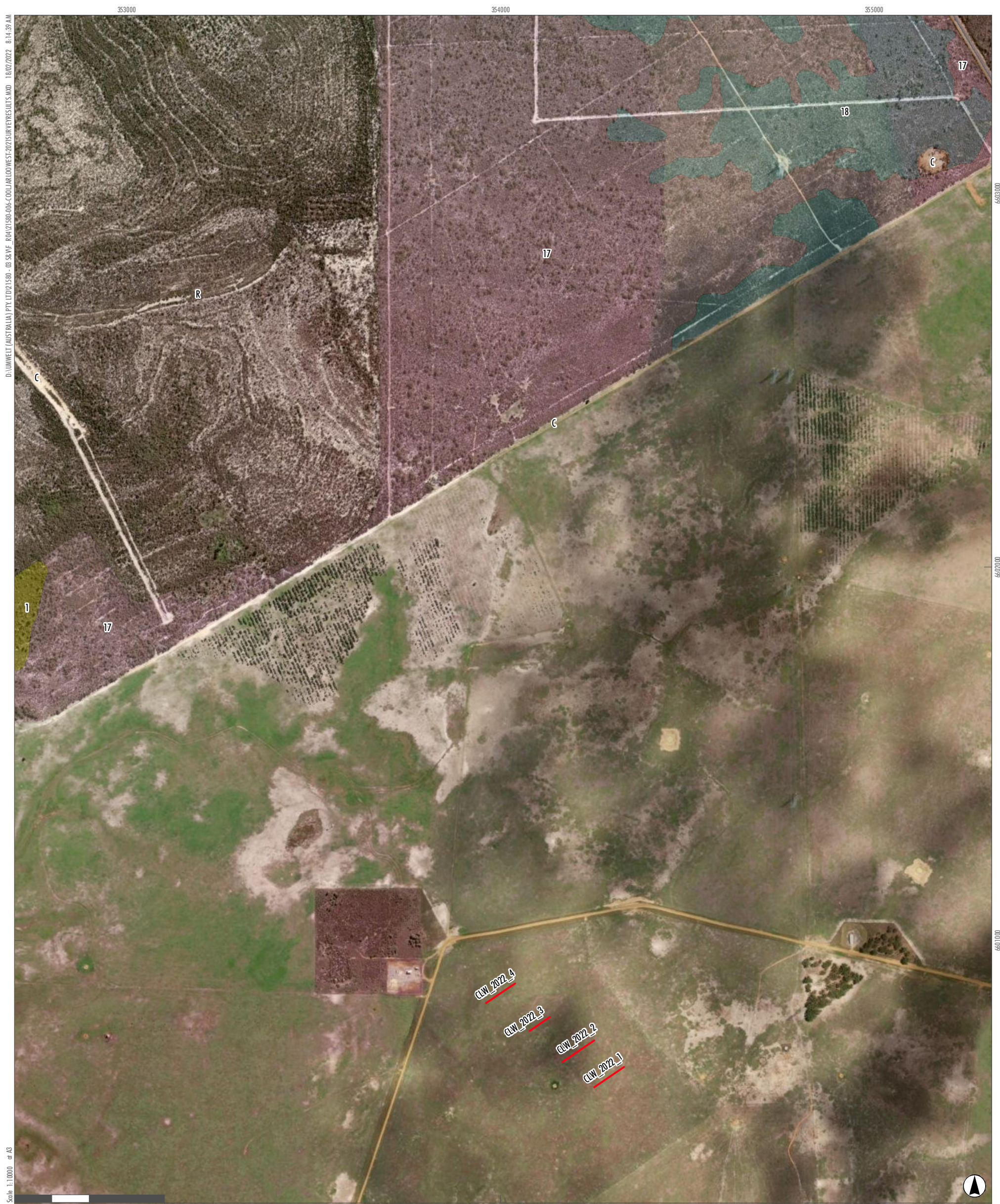


FIGURE 4.3  
Sheet 4

2022 Exploration Drilling Program –  
Cooljarloo West – 2021 Survey Results



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Scale: 1:10000 at A3

- Legend**
- Surveyed Centrelines (2022)
  - Proposed Drill Line - Survey Required
  - Proposed Drill Line - No Survey Required
  - Proposed Access - Survey Required
  - Existing Access
  - TEC Occurrences 2022
  - Wetlands 2022
  - Roads
- | Vegetation Types  |    |
|---|----|
| <span style="background-color: yellow; border: 1px solid black; width: 15px; height: 10px; display: inline-block;"></span>  | 1  |
| <span style="background-color: #f0e68c; border: 1px solid black; width: 15px; height: 10px; display: inline-block;"></span> | 17 |
| <span style="background-color: #add8e6; border: 1px solid black; width: 15px; height: 10px; display: inline-block;"></span> | 18 |

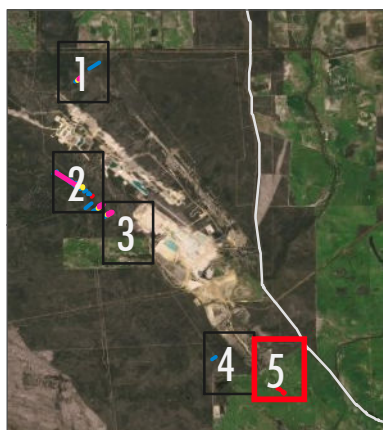


FIGURE 4.3

Sheet 5

2022 Exploration Drilling Program –  
Cooljarloo West – 2021 Survey Results

## 4.2.2 Cooljarloo North West/Jurien

### 4.2.2.1 Significant Flora

Two significant flora taxa were recorded during the field survey of the 2022 exploration drilling program at CNW/Jurien; these are listed in **Table 4-7**, along with the drill lines or access tracks they were recorded on. These two taxa have previously been recorded in the CNW/Jurien area.

The locations of the significant flora recorded are presented in **Figure 4-4**. Appendix C presents the point locations and number of individuals for all significant flora taxa recorded during the field survey.

Appendix D presents TPFRFs to be submitted to DBCA for these records.

**Table 4-7: Significant Flora Taxa Recorded by the Field Survey at Cooljarloo North West/Jurien**

Significant Flora Taxon	Conservation Status	No. of Point Locations Recorded	No. of Individuals Recorded	Drill Line / Access Track Recorded
<i>Hensmania stoniella</i>	P3	1	1	CNW_22_04
<i>Schoenus griffinianus</i>	P4	1	1	CNW_22_04

### 4.2.2.2 Significant Vegetation and Wetlands

The field survey confirmed that the EPBC-listed TEC 'Banksia Woodlands of the Swan Coastal Plain' (Endangered) occurs on the drill lines and access tracks nominated for survey in **Section 4.1.2.4**. Based on the results of the field survey, together with the results of previous surveys by Woodman Environmental, the TEC is therefore considered to occur along the following drill lines and access tracks:

- CNW\_2022\_2
- CNW\_2022\_3
- CNW\_2022\_4 and access
- CNW\_2022\_5 and access
- CNW\_2022\_6
- CNW\_2022\_7
- CNW\_2022\_8
- CNW\_2022\_7-8\_Access.

The location of this TEC with regard to the 2022 exploration drilling program is displayed on **Figure 4-4**. Further details are provided in **Table 4-8 (Section 4.2.2.4)**, with potential impacts discussed in **Section 4.3.3**.

For the purposes of characterizing the vegetation and assessing it against the criteria for the 'Banksia Woodlands of the Swan Coastal Plain' TEC, all plant communities encountered were described, with descriptions generated from notes taken during the survey (as per **Section 3.3.2**). No formal vegetation sampling was undertaken. Nine plant communities are considered to be intersected by the drill lines and access tracks surveyed. These are described below, with photographs also presented. It should be noted

that the vegetation classification presented here follows that presented in Woodman Environmental (2018) and Woodman Environmental (2021); i.e. Communities 1, 2 and 3 are equivalent to Communities 1, 2 and 3 as presented in Woodman Environmental (2018) and Woodman Environmental (2021). All plant communities are represented by relatively intact remnant vegetation; all vegetation in these communities was observed to be in either Excellent or Very Good condition as per the vegetation condition scale presented in EPA (2016a) (as adapted from Keighery (1994)).

Communities 1, 2, 11 and 13 were considered to represent the 'Banksia Woodlands of the Swan Coastal Plain' TEC, as they satisfy the key diagnostic characteristics of this community (Threatened Species Scientific Committee 2016). As noted above, all vegetation representing these communities was considered to be in Very Good or better condition, which satisfies the condition thresholds for this TEC (Threatened Species Scientific Committee 2016). Although specific definition of patches of this TEC intersected by the 2022 exploration drilling program is beyond the scope of this assessment, review of aerial photography, in combination with field observations, indicates that all occurrences intersected are part of large areas of Banksia woodland in similar condition. All occurrences intersected are therefore considered to represent patches that meet the patch size threshold for the TEC (Threatened Species Scientific Committee 2016).

**CNW/Jurien Community 1:** Low woodland dominated by *Banksia prionotes* and occasionally *Banksia attenuata* over mid to low shrubland of mixed species including *Melaleuca systema*, *Hibbertia hypericoides* and *Scholtzia umbellifera* on yellow-brown sand on upper slopes of dunes.



**Plate 4-1: CNW/Jurien Community 1**

**CNW/Jurien Community 2:** Low woodland dominated by *Banksia attenuata*, *Banksia menziesii*, *Eucalyptus todtiana* and occasionally *Banksia prionotes* over mid to low shrubland dominated by *Eremaea pauciflora*, *Daviesia divaricata* subsp. *divaricata* and *Hibbertia hypericoides* on grey-yellow sand on lower dune slopes and swales.



**Plate 4-2: CNW/Jurien Community 2**

**CNW/Jurien Community 3:** Isolated low trees of *Banksia prionotes* over mid shrubland dominated by *Banksia leptophylla*, *Banksia sessilis* var. *cygnorum*, *Melaleuca systema* and *Conospermum stoechadis* on yellow-brown sand over occasional limestone outcropping on dune crests.



**Plate 4-3: CNW/Jurien Community 3**

**CNW/Jurien Community 5:** Low open woodland dominated by *Melaleuca raphiophylla* and occasionally *Melaleuca preissiana* over tall isolated shrubs of *Acacia cyclops* over mid sedgeland dominated by *Machaerina juncea* and *Lepidosperma longitudinale* on grey-brown sandy clay in closed depressions.



**Plate 4-4: CNW/Jurien Community 5**

**CNW/Jurien Community 10:** Low woodland dominated by *Eucalyptus tottiana* and *Melaleuca preissiana* over low shrubland of mixed species including *Eremaea pauciflora*, *Melaleuca leuropoma*, *Banksia telmatiaea*, *Calytrix aurea* and *Beaufortia squarrosa* on grey sand in a dune swale.



**Plate 4-5: CNW/Jurien Community 10**

**CNW/Jurien Community 11:** Low woodland dominated by *Banksia attenuata*, *Banksia menziesii* and *Eucalyptus tottiana* over low shrubland of mixed species including *Eremaea pauciflora*, *Melaleuca leuropoma*, *Petrophile macrostachya*, *Hibbertia hypericoides* and *Stirlingia latifolia* over low sparse forbland dominated by *Dasypogon obliquifolius* and *Patersonia occidentalis* on grey sand on a plain.



**Plate 4-6: CNW/Jurien Community 11**

**CNW/Jurien Community 12:** Isolated low trees of *Eucalyptus tottiana* over low shrubland of mixed species including *Eremaea pauciflora*, *Conospermum stoechadis*, *Melaleuca leuropoma*, *Petrophile macrostachya* and *Hibbertia hypericoides* over low sparse sedgeland and forbland dominated by *Dasyopogon obliquifolius* and *Mesomelaena pseudostygia* on yellow-grey sand on a plain.



**Plate 4-7: CNW/Jurien Community 12**

**CNW/Jurien Community 13:** Low woodland of *Banksia prionotes* and *Eucalyptus tottiana* over mid sparse shrubland of *Verticordia grandis* over low shrubland of mixed species including *Eremaea pauciflora*, *Conospermum stoechadis*, *Melaleuca leuropoma*, *Petrophile macrostachya* and *Hibbertia hypericoides* over low sparse sedgeland dominated by *Mesomelaena pseudostygia* on yellow sand on a dune crest.



**Plate 4-8: CNW/Jurien Community 13**

**CNW/Jurien Community 14:** Low shrubland of mixed species dominated by *Banksia sessilis*, *Xanthorrhoea preissii*, *Calothamnus quadrifidus*, *Hakea incrassata* and *Hibbertia hypericoides* on brown clay loam with frequent ironstone outcropping on a low ridge.



**Plate 4-9: CNW/Jurien Community 14**

As mentioned in **Section 4.1.2.2** , as the ‘Banksia Woodlands of the Swan Coastal Plain’ TEC is widespread in the CNW/Jurien area and occurs in large polygons, it is not possible to deviate around it, and therefore no deviations were established.

Two areas considered to be wetlands are intersected by the proposed alignments of the 2022 exploration drilling program; both are intersected by drill line CNW\_2022\_10. These wetlands are large swampy depressions that, although dry at the time of survey, likely often hold some water in late Winter-early



Spring, and contained large, apparently old trees of *Melaleuca preissiana* and *Melaleuca raphiophylla* at relatively high densities (see **Plate 4-4**). The vegetation is also considered to be in Very Good condition, with weeds at relatively low levels. It is not considered possible for access to occur without removal of a relatively large number of such trees, resulting in an impact that is considered significant in the context of the 2022 exploration drilling program. Additionally, the disturbance associated with access would likely result in a relatively high risk of significant weed invasion, given that the wetland is surrounded by pasture. Access to the sections of CNW\_2022\_10 that intersect this wetland is not recommended. It is not possible to deviate around the western of the wetland areas. A deviation around part of the eastern wetland has been proposed to allow access to part of this drill line that would otherwise require impact to the wetland areas to access (see **Figure 4-4**); however, the remainder of the wetland area cannot be deviated around. This is discussed further in **Section 4.2.2.4**.

One potential ferricrete ridge was intersected by the proposed alignments of the 2022 exploration drilling program, at the very western end of CLW\_2022\_10. As mentioned in **Section 4.1.2.2**, plant assemblages on ferricrete soils in the south-west of W.A. are considered to be of high conservation significance. As the ferricrete ridge extends north, south and west of the alignment of CLW\_2022\_10, a deviation around the ridge is not possible. Access is therefore not recommended to the western end of this line. In addition, the ridge is 5-10 m high, very steep and very rocky with large boulders, and therefore access for vehicles would be difficult without significant ground disturbance.

#### 4.2.2.3 Other Environmental Values

Other relevant environmental values noted by the field survey include:

- No significant fauna habitat was identified that is at risk of being impacted by the 2022 exploration drilling program, including trees considered suitable roosting or nesting habitat for Carnaby's Cockatoo. However, much of the vegetation is considered to be foraging habitat for this species.
- The 2022 exploration drilling program is unlikely to cause any impacts on surface or ground water hydrology, with access not recommended to large wetlands to avoid any impacts.

#### 4.2.2.4 Values of Individual Drill Lines and Access Tracks

Relevant environmental values for each individual drill line and access track are presented in **Table 4-8**, including soils and general vegetation characteristics. Note that only drill lines and access tracks proposed for survey in **Section 4.1.2.4** are included in **Table 4-8**.

**Table 4-8: Cooljarloo North West/Jurien Drill Line and Access Track Survey Outcomes**

Line/Access	Survey Requirement	Comments
CNW_2022_2	Line required survey (vegetation not previously assessed – may intersect Banksia Woodlands TEC)	<ul style="list-style-type: none"> <li>• Line in remnant vegetation – not flagged.</li> <li>• Vegetation appears healthy, but recently burnt (approximately 3 years), with a small portion burnt less than 1 year prior to survey.</li> <li>• Vegetation is CNW/Jurien Community 3 (very western end and eastern part) and CNW/Jurien Community 1 (central-western part), in Very Good condition.</li> <li>• CNW/Jurien Community 1 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dune crest and slope.</li> <li>• Soil is yellow-brown sand, with occasional limestone, dry.</li> </ul>
CNW_2022_3	Line required survey (vegetation not previously assessed – may intersect Banksia Woodlands TEC)	<ul style="list-style-type: none"> <li>• Line in remnant vegetation – not flagged.</li> <li>• Vegetation appears healthy, no disturbances.</li> <li>• Vegetation is CNW/Jurien Community 2 (eastern part), and CNW/Jurien Community 3 (western part), in Excellent condition.</li> <li>• CNW/Jurien Community 2 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dune slope.</li> <li>• Soil is yellow-brown or brown sand, with some limestone at the western end, dry.</li> </ul>
CNW_2022_4	Line required survey (vegetation not previously assessed – may intersect Banksia Woodlands TEC)	<ul style="list-style-type: none"> <li>• Line in remnant vegetation – not flagged.</li> <li>• Vegetation appears healthy, but relatively recently burnt.</li> <li>• Vegetation is CNW/Jurien Community 2 (central part), CNW/Jurien Community 10 (eastern end) and CNW/Jurien Community 11, in Very Good to Excellent condition.</li> <li>• CNW/Jurien Community 2 and Community 11 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC;</li> <li>• Habitat is dune crests, slopes and swale, and plain.</li> <li>• Soil is grey or yellow-brown sand, dry.</li> </ul>
CNW_2022_4_Access	Line required survey (vegetation not previously assessed – may intersect Banksia Woodlands TEC)	<ul style="list-style-type: none"> <li>• Line in remnant vegetation – not flagged.</li> <li>• Vegetation appears healthy, but relatively recently burnt.</li> <li>• Vegetation is CNW/Jurien Community 2 (eastern part) and CNW/Jurien Community 10 (western part), in Very Good to Excellent condition.</li> <li>• CNW/Jurien Community 2 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC;</li> <li>• Habitat is dune slopes and swale.</li> <li>• Soil is grey or yellow-brown sand, dry.</li> </ul>

Line/Access	Survey Requirement	Comments
CNW_2022_6	Line required survey (vegetation not previously assessed – may intersect Banksia Woodlands TEC)	<ul style="list-style-type: none"> <li>• Line in remnant vegetation – not flagged.</li> <li>• Vegetation appears healthy, no disturbances.</li> <li>• Vegetation is CNW/Jurien Community 12 (western part), and CNW/Jurien Community 13 (eastern part), in Excellent condition.</li> <li>• CNW/Jurien Community 13 considered to represent the Banksia Woodlands of the Swan Coastal Plain TEC.</li> <li>• Habitat is dune crest and plain.</li> <li>• Soil is yellow-grey or yellow sand, dry.</li> </ul>
CNW_2022_6_Access	Whole line required survey (vegetation not previously assessed – may intersect Banksia Woodlands TEC)	<ul style="list-style-type: none"> <li>• Line in remnant vegetation – not flagged.</li> <li>• Vegetation appears healthy, no disturbances.</li> <li>• Vegetation is CNW/Jurien Community 12, in Excellent condition.</li> <li>• Habitat is plain.</li> <li>• Soil is yellow-grey sand, dry.</li> </ul>
CNW_2022_10	Part of line required survey (vegetation not previously assessed – may intersect significant wetland and ferricrete ridge)	<ul style="list-style-type: none"> <li>• Western and eastern parts of line in intact remnant vegetation (except very eastern end) – not flagged. Central part in cleared paddock, with some isolated remnant trees and shrubs present – not flagged.</li> <li>• Vegetation of western and eastern parts of line healthy, no disturbances.</li> <li>• Vegetation of western part of line is CNW/Jurien Community 5 (very western end) and CNW/Jurien Community 14; vegetation of eastern part of line is CNW/Jurien Community 5; all vegetation in Very Good condition.</li> <li>• CNW/Jurien Community 14 potentially represents significant vegetation (ferricrete ridge) – access is not recommended to this section.</li> <li>• CNW/Jurien Community 5 occurrences represent significant wetlands that may be inundated in late winter/early spring – access is not recommended to avoid impacts to these wetlands.</li> <li>• Access is therefore not recommended to the western or eastern parts of the line. A deviation has been surveyed from the western end of the eastern part of the line that allows access to the center of the eastern part of the line and avoids impact to the wetland, and the very eastern end of the line can be accessed from adjacent paddock, but access is not recommended to intervening areas.</li> <li>• Habitat is rocky ferricrete ridge, closed depressions (wetlands) which may be inundated in late winter/early spring, and plains.</li> <li>• Soil is brown clay loam, grey-brown sandy clay and grey sand, dry.</li> </ul>



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GDA2020 MGA Zone 50

- Legend**
- Proposed Drill Line - Survey Required
  - Proposed Drill Line - No Survey Required
  - Proposed Access - Survey Required
  - Proposed Access - No Survey Required
  - Existing Access
  - Deviations 2022
  - Access Not Recommended 2022
  - TEC Occurrences 2022
  - Wetlands 2022
  - Roads

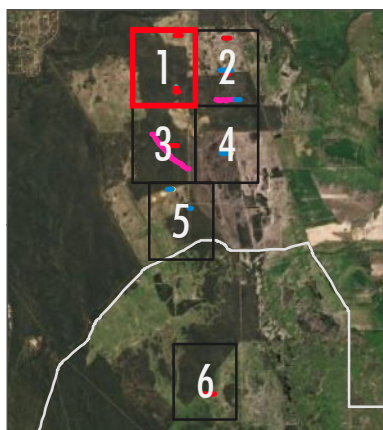
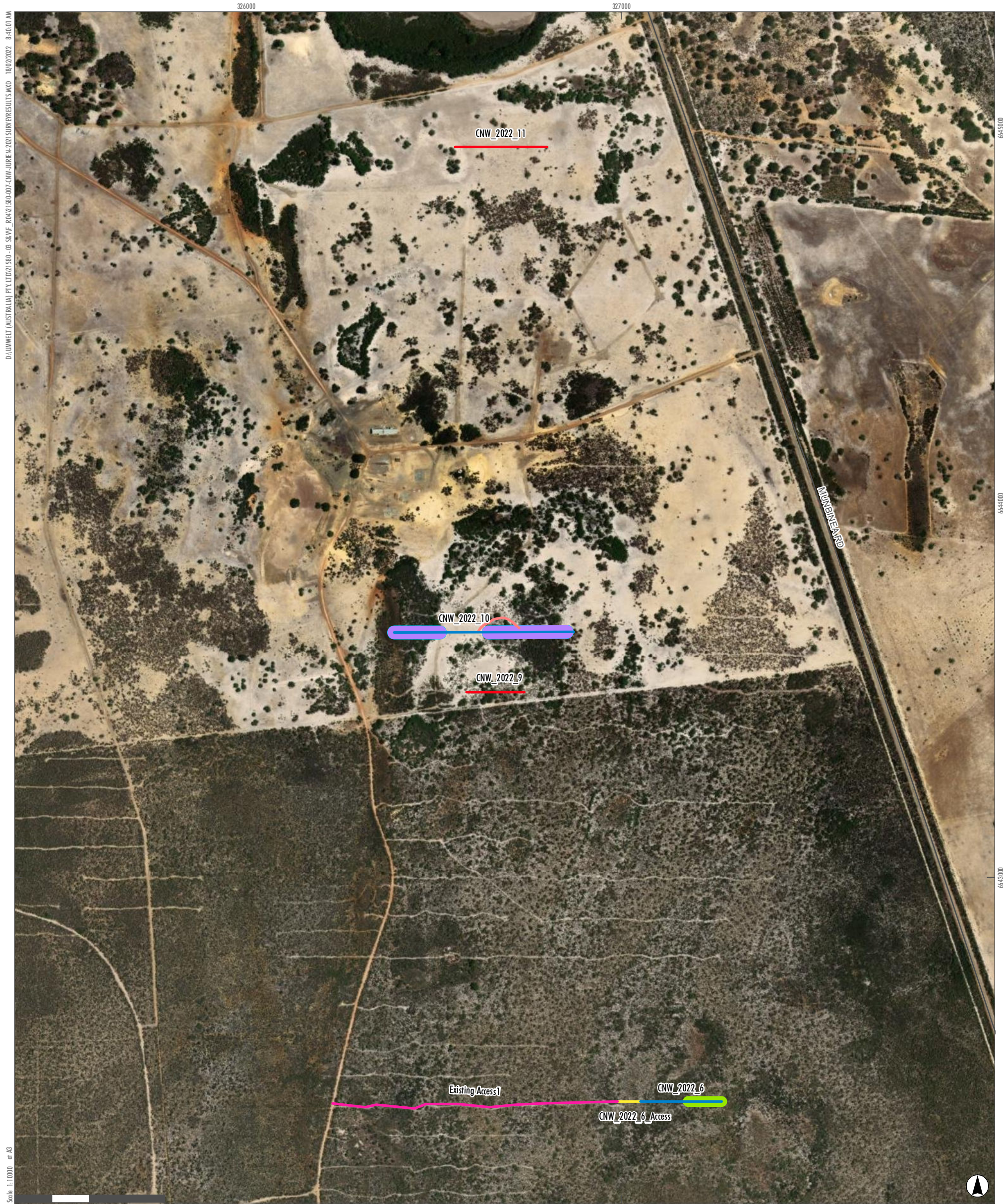


FIGURE 4.4  
Sheet 1

2022 Exploration Drilling Program –  
CNW/Jurien – 2021 Survey Results



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Scale: 1:10000 at A3

GDA2020 MGA Zone 50

- Legend**
- Proposed Drill Line - Survey Required
  - Proposed Drill Line - No Survey Required
  - Proposed Access - Survey Required
  - Proposed Access - No Survey Required
  - Existing Access
  - Deviations 2022
  - Access Not Recommended 2022
  - TEC Occurrences 2022
  - Wetlands 2022
  - Roads

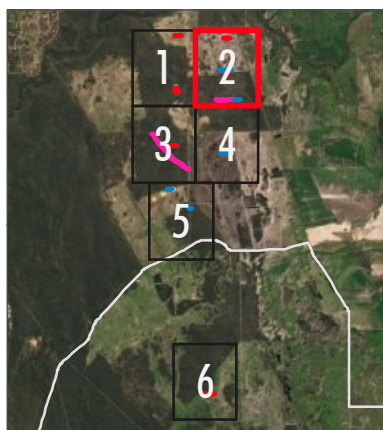
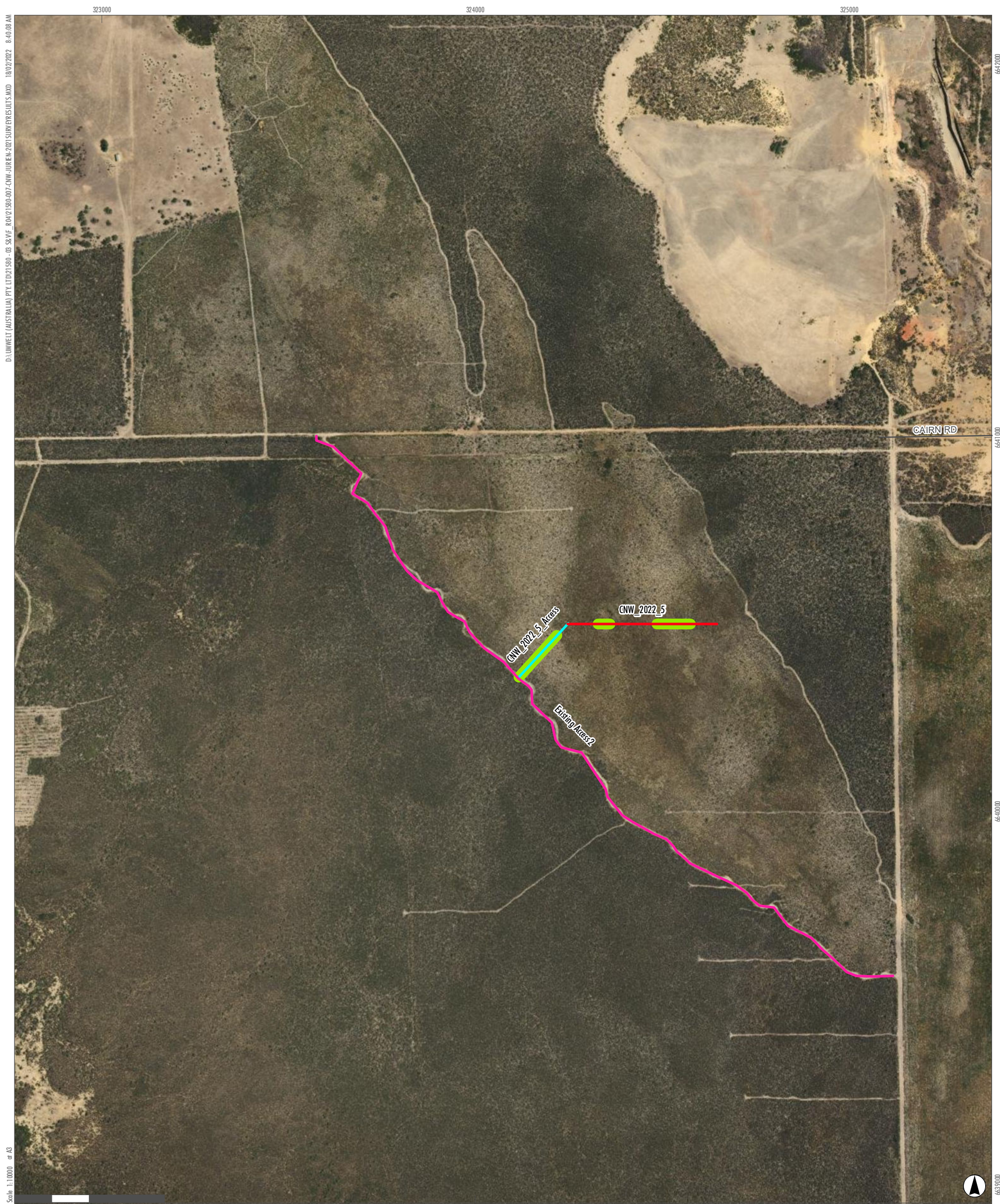


FIGURE 4.4  
Sheet 2

2022 Exploration Drilling Program –  
CNW/Jurien – 2021 Survey Results



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GDA2020 MGA Zone 50

- Legend**
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  - Proposed Access - Survey Required
  - Proposed Access - No Survey Required
  - Existing Access
  - Deviations 2022
  - Access Not Recommended 2022
  - TEC Occurrences 2022
  - Wetlands 2022
  - Roads

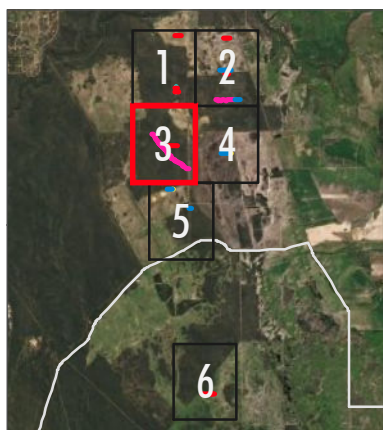


FIGURE 4.4  
Sheet 3

2022 Exploration Drilling Program –  
CNW/Jurien – 2021 Survey Results



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664200

664100

664000

663900

GDA2020 MGA Zone 50

- Legend**
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  - Proposed Drill Line - No Survey Required
  - Proposed Access - Survey Required
  - Proposed Access - No Survey Required
  - Existing Access
  - Deviations 2022
  - Access Not Recommended 2022
  - TEC Occurrences 2022
  - Wetlands 2022
  - Roads
- Significant Flora (2021)**
- *Hensmania stoniella* (P3)
  - ★ *Schoenus griffinianus* (P4)

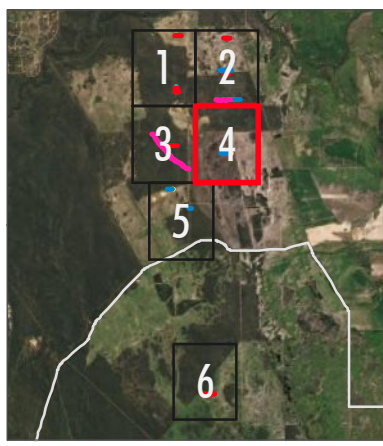


FIGURE 4.4

Sheet 4

2022 Exploration Drilling Program –  
CNW/Jurien – 2021 Survey Results



- Legend**
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  - Proposed Drill Line - No Survey Required
  - Proposed Access - Survey Required
  - Proposed Access - No Survey Required
  - Existing Access
  - Deviations 2022
  - Access Not Recommended 2022
  - TEC Occurrences 2022
  - Wetlands 2022
  - Roads

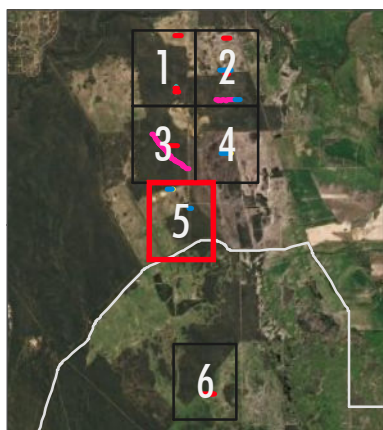


FIGURE 4.4

Sheet 5

2022 Exploration Drilling Program –

CNW/Jurien – 2021 Survey Results





**Legend**

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- Proposed Drill Line - No Survey Required
- Proposed Access - Survey Required
- Proposed Access - No Survey Required
- Existing Access
- Deviations 2022
- Access Not Recommended 2022
- TEC Occurrences 2022
- Wetlands 2022
- Roads

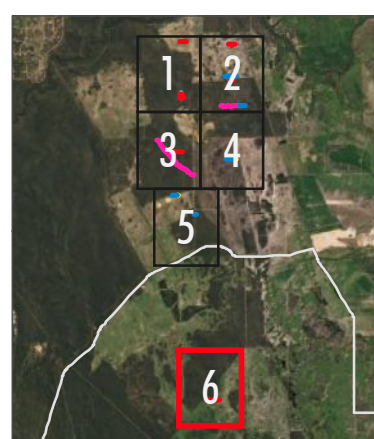


FIGURE 4.4

Sheet 6

2022 Exploration Drilling Program –  
CNW/Jurien – 2021 Survey Results

## 4.3 Impact Assessment

### 4.3.1 Cooljarloo West

#### 4.3.1.1 Significant Flora

None of the significant taxa except *Poranthera asybosca* (P1) (discussed below) that were recorded during field survey require impact assessment in the context of numbers of individuals, with no impacts expected to any listed Threatened taxa, or taxa which are considered to be of High significance to the regional conservation status of the taxon (as per **Table 3-1**) as a result of the 2022 exploration drilling program.

*Poranthera asybosca* (P1) was recorded along two drill lines; however, as noted in **Section 4.2.2.1**, this taxon was not known to occur in the CLW Study Area at the time of survey, and was not positively identified in the field. Therefore, no deviations were established to avoid this taxon. However, as this taxon is an annual species, the local distribution and abundance is likely temporally dynamic, and plants may not necessarily occur in the exact recorded location in subsequent years; plants may therefore occur along deviations in subsequent years. As outlined in **Section 4.2.2.1**, this taxon was recorded at two locations in the CLW Study Area, with both of these recorded within the 3 m clearing width of the 2022 exploration drilling program. Given that this taxon is currently known from so few locations, as per **Table 3-3**, the potential local impact to this taxon theoretically would be rated as High. The presence of only a small number of regional populations also results in the potential regional significance of this impact (as per **Table 3-4**) being rated as Moderate-High. However, as noted in **Section 4.2.1.1**, because it has only recently been listed as a Priority taxon, no targeted survey has been conducted for this species in the CLW Study Area; based on the results of this current survey and other surveys as mentioned in **Section 4.2.1.1**, it is expected that this species would occur at further point locations.

Notwithstanding this, it is considered unlikely that this species will be directly impacted by the proposed drilling given it is an annual species (as discussed in **Section 4.2.1.1**), provided that drilling activities are undertaken outside of the period when plants will be present (May to December). Although the soil-stored seed of this species may be driven over by machinery during drilling activities, it is unlikely that such activities will destroy seeds and prevent germination and establishment in the subsequent winter season. If drilling activities were to occur during the growth period of this taxon, impacts may occur, but would likely not be significant, as it is expected that this taxon would occur in adjacent areas and may not even occur at the exact same locations on the drill lines in subsequent years (given that it is an annual taxon). It is possible that this species may establish in greater numbers on recently cleared drill lines compared to adjacent undisturbed vegetation, as its life history implies preference for open clearings where light availability is enhanced.

As noted in previous sections, the field survey was not conducted at the appropriate time to locate and identify individuals of *Caladenia denticulata* subsp. *albicans* (P1) and *Thelymitra pulcherrima* (P2). The 2022 exploration drilling program is not located in the vicinity of known locations of either taxon, and no potential individuals of either taxon were located in fruit; it is considered unlikely that either taxon occurs in any of the areas to be impacted by the 2022 exploration drilling program. Both taxa are summer-dormant tuberous species; provided that the proposed drilling occurs outside of the period when plants will be present, any plants potentially occurring in areas to be impacted are less likely to be affected by drilling activities.

**Table 4-9** presents a summary of local impacts on the preferred habitat (VTs) of significant flora taxa that were considered to require survey and impact assessment (as per **Section 4.1.1.1**), using the 3m clearing width. The surveyed centrelines only were used to calculate impacts. The impact on the preferred habitat of all significant flora taxa is rated Low. Note that *Caladenia denticulata* subsp. *albicans* (P1) and *Poranthera asybosca* (P1) are not included in **Table 4-9** as the preferred habitat of these taxa requires verification.

**Table 4-9: Impact (3m Clearing Width) on Preferred Habitat of Significant Flora that Require Survey and Impact Assessment, Cooljarloo West**

Significant Flora Taxon	Preferred Habitat (VT) Proposed to be Impacted	Preferred Habitat within 3m Clearing Width (ha)	Total Preferred Habitat (ha) (Woodman 2014a)	Potential Percentage of Impact	Rating of Potential Impact (Table 3-3)
<i>Andersonia gracilis</i> (Threatened)	1, 5	0.44	7,095	0.006	Low
<i>Anigozanthos viridis</i> subsp. <i>terraspectans</i> (Threatened)	1	0.40	4,151	0.010	Low
<i>Babingtonia delicata</i> (P1)	1, 5	0.44	6,039	0.007	Low
<i>Levenhookia preissii</i> (P1)	1, 6, 17	0.99	20,860	0.005	Low
<i>Lyginia excelsa</i> (P2)	17	0.54	16,371	0.003	Low
<i>Macarthuria keigheryi</i> (Threatened)	17, 18	0.62	22,716	0.003	Low
<i>Paracaleana dixonii</i> (T)	17	0.54	16,371	0.003	Low
<i>Thelymitra pulcherrima</i> (P2)	1	0.40	4,151	0.010	Low

#### 4.3.1.2 Significant Vegetation and Wetlands

As outlined in **Section 4.2.1.2**, the 2022 exploration drilling program will impact the ‘Banksia Woodlands of the Swan Coastal Plain’ TEC. In the context of this current survey, the TEC is represented by VTs 17, 18 and a single occurrence of VT 6 intersected by drill line CLW\_2022\_07. The impacts on this TEC at CLW are assessed in **Section 4.3.3**, in the context of the entire Cooljarloo Exploration Area.

The significant vegetation communities VT 6 and 9b (Woodman Environmental 2014a) are intersected by the 2022 exploration drilling program and require impact assessment. The level of local impact to these VTs is considered to be Low, with only a very small area likely to be impacted (**Table 4-10**).

**Table 4-10: Local Impact on Significant Vegetation Types (3m Clearing Width)**

VT	Conservation Rating	Area to be Impacted (ha) (3m Clearing Width)	Total Area Mapped (ha) (Woodman 2014a)	Potential Percentage of Impact	Rating of Potential Impact (Table 3-5)
6	Very High	0.04	338	0.01	Low
9b	Very High	0.02	284	0.01	Low

No wetlands likely to be significantly impacted by the 2022 exploration drilling program were recorded by the field survey. The wetlands intersected by the 2022 exploration drilling program primarily contain low

shrubland vegetation and are only likely to be seasonally moist, with surface water generally unlikely to be present. However, it is desirable that these areas are accessed when soil conditions are dry. This is discussed further in **Section 5.0**.

#### **4.3.1.3 Other Environmental Values**

The 2022 exploration drilling program is unlikely to cause any significant impact to fauna, with no significant fauna habitat identified that is at risk of being impacted. Although the majority of the vegetation to be impacted by the 2022 exploration drilling program is considered to be foraging habitat for Carnaby's Cockatoo, impacts on foraging habitat are considered to be low level and likely to be short-lived.

As mentioned in **Section 4.2.1.3**, the 2022 exploration drilling program is unlikely to cause any impacts on surface or ground water hydrology, provided that drilling is conducted during dry soil conditions where there is no risk of surface water being present in the intersected wetland areas (**Figure 4-3**). Ground disturbance will be limited to vehicle tracks that are unlikely to impede surface water flows, and vegetation will not be completely removed such that surface water could cause erosion. It is considered that the possible introduction of pollutants to surface water or ground water by machinery can be appropriately managed by Tronox under their EMP.

### **4.3.2 Cooljarloo North West/Jurien**

#### **4.3.2.1 Significant Flora**

No significant flora taxa requiring impact assessment were identified by the field survey at CNW/Jurien (as per **Section 4.1.2.1**).

#### **4.3.2.2 Significant Vegetation and Wetlands**

As outlined in **Section 4.2.2.2**, the 2022 exploration drilling program will impact the 'Banksia Woodlands of the Swan Coastal Plain' TEC. The impacts on this TEC at CNW/Jurien are assessed in **Section 4.3.3**, in the context of the entire Cooljarloo Exploration Area.

As discussed in **Section 4.2.2.2**, the proposed alignment of drill line CNW\_2022\_10 intersects two areas considered to be wetlands on the western and eastern parts of this line. Access to these wetland areas would require removal of a relatively large number of large, apparently old trees of *Melaleuca preissiana* and *Melaleuca raphiophylla* and also result in a relatively high risk of significant weed invasion. Access to the sections of CNW\_2022\_10 that intersect these wetlands is not recommended. A deviation around part of the eastern wetland has been proposed to allow access to part of this drill line; however, the remainder of the wetland area cannot be deviated around (**Figure 4-4**). In addition, the very western end of CNW\_2022\_10 intersects a potential ferricrete ridge which may represent significant vegetation (see **Section 4.1.2.2**). Access is therefore not recommended to the western end of this line.

No wetlands are likely to be significantly impacted by the 2022 exploration drilling program provided the wetland areas intersecting CNW\_2022\_10 are not accessed.

#### **4.3.2.3 Other Environmental Values**

The 2022 exploration drilling program is unlikely to cause any significant impact long-term impacts on fauna, with no significant fauna habitat identified that is at risk of being impacted. Although the majority of the vegetation to be impacted by the 2022 exploration drilling program is considered to be foraging habitat

for Carnaby’s Cockatoo, impacts on foraging habitat are considered to be low-level and likely to be short-lived.

As mentioned in **Section 4.2.2.3**, the 2022 exploration drilling program is unlikely to cause any impacts on surface or ground water hydrology. It is considered that the possible introduction of pollutants to surface water or ground water by machinery can be appropriately managed by Tronox under their EMP.

### 4.3.3 Impact on ‘Banksia Woodlands of the Swan Coastal Plain’ TEC

The 2022 exploration drilling program will impact the ‘Banksia Woodlands of the Swan Coastal Plain’ TEC at CLW and CNW/Jurien. **Table 4-11** provides a breakdown of the potential impact on this TEC; no sub-communities are considered, as all occurrences of the TEC have been mapped as Vegetation System Association Bassendean 1030 (see **Section 2.3**), and FCTs have not been defined for the CEA (see **Section 4.1.1.2**). It should be noted that in the context of the 2022 exploration drilling program, at CLW this TEC is considered to be VTs 17, 18 and one occurrence of VT 6 (VTs as defined by Woodman Environmental (2014a)), with the area to be impacted calculated using the length of surveyed centrelines. For CNW/Jurien, the TEC has been defined using a combination of field observations from this and previous surveys, and aerial photography, and the area to be impacted has been calculated using the length of provided centrelines (see **Section 4.2.2.4**).

**Table 4-11: Impact on ‘Banksia Woodlands of the Swan Coastal Plain’ TEC (3 m Clearing Width)**

Exploration Area	Length of Drill Lines/Access Tracks within TEC (m)	Area of TEC (ha) to be Impacted (3m Clearing Width)	Total Area of TEC in Local Area (ha)	Percentage Impact
CLW	2,068	0.6	22,716*	0.003
CNW/Jurien	1,284	0.4	NA	NA
<b>Total</b>	3,352	1.0	NA	NA

\*Note: As not all areas of VT 6 within the Cooljarloo West Study Area represent the ‘Banksia Woodlands of the Swan Coastal Plain’ TEC, the total area of VT 6 has not been included in the total for ‘Total Area of TEC in Local Area’.

The level of impact to the TEC at CLW is therefore rated Low, as per **Table 3-5**. Although it is not possible to rate the level of impact to the TEC at CNW/Jurien and the combined level of impact, given that the extent of the TEC has not been mapped across both the CNW/Jurien area, it is considered that both would be rated Low as per **Table 3-5**. The TEC is known to be widespread at CLW and CNW/Jurien; over 22,000 ha have been mapped as either VT 17 or 18 at CLW, and it has been recorded frequently and in large patches across the CNW/Jurien area. Additionally, it is also considered that the method of clearing in this TEC, where vegetation is generally driven over rather than cleared, and the majority of large trees (including Banksia species) are avoided, results in a short-term impact only; this has been demonstrated by field observations by Woodman Environmental and other consultants on historical drill lines, which have noted significant regrowth (see **Section 5.0**, and Woodman Environmental 2017b). No patches of the TEC are being completely removed, and the short-term impact does not result in fragmentation or permanent reduction of the TEC, which are the primary threats to this TEC (Threatened Species Scientific Committee 2016).

It is also considered that through the implementation of Tronox’s EMP, particularly controls relating to clearing methods and preventing the introduction of Dieback and weeds, the 2022 exploration drilling program will not result in any indirect impacts to the TEC occurring, including modifying or destroying

abiotic factors necessary for the TEC's survival, causing a substantial change to the species composition of the TEC, or causing a substantial reduction in the quality or integrity of the occurrences of the TEC.

It is therefore considered that none of the Significant Impact Criteria for an endangered ecological community listed under the EPBC Act (Commonwealth of Australia 2013) are met in the context of the 2022 exploration drilling program. The impact on the 'Banksia Woodlands of the Swan Coastal Plain' TEC from the 2022 exploration drilling program is therefore not considered a significant impact under the EPBC Act; referral to the Commonwealth Minister for the Environment is therefore not considered to be required.

## 5.0 Discussion and Conclusions

There were no Threatened taxa recorded during the field survey, and therefore the 2022 exploration drilling program will therefore not impact any Threatened flora individuals. Impacts arising from the 2022 exploration drilling program to the Priority flora taxa recorded by the field survey are likely to be temporary. All significant flora taxa are likely to re-establish on cleared drill lines and access tracks, particularly given that the vegetation will not be completely removed.

Woodman Environmental (2017b) conducted a review of data from Tronox's Permit to Take monitoring programme, which monitors recovery of Threatened flora taxa on exploration lines and access tracks where individuals have been impacted, as well as the health of individuals adjacent to such drill lines and access tracks (Woodman Environmental 2017b). A one-off assessment of the regeneration of vegetation along exploration lines (Mattiske 2013) was also incorporated into the review. The review concluded that the available data provides a strong indication that Tronox's exploration activities have had limited ongoing impacts on Threatened flora taxa, and their habitat.

In light of this, it is expected that significant flora taxa and associated habitat impacted by the 2022 exploration drilling program will respond in a similar manner to previous exploration activities, provided that clearing practices as stipulated under the EMP are adhered to.

The proposed alignment for drill line CNW\_2022\_10 intersects two wetland areas considered to be significant, and a potential ferricrete ridge that may represent significant vegetation. Access to these areas is not recommended. The remaining wetlands intersected by the 2022 exploration drilling program are not expected to be significantly impacted, provided they are accessed when soil conditions are dry. Access under wet soil conditions may result in exacerbated disturbance to the ground surface, and potentially, additional impact to vegetation if vehicles or equipment become bogged in wet soil.

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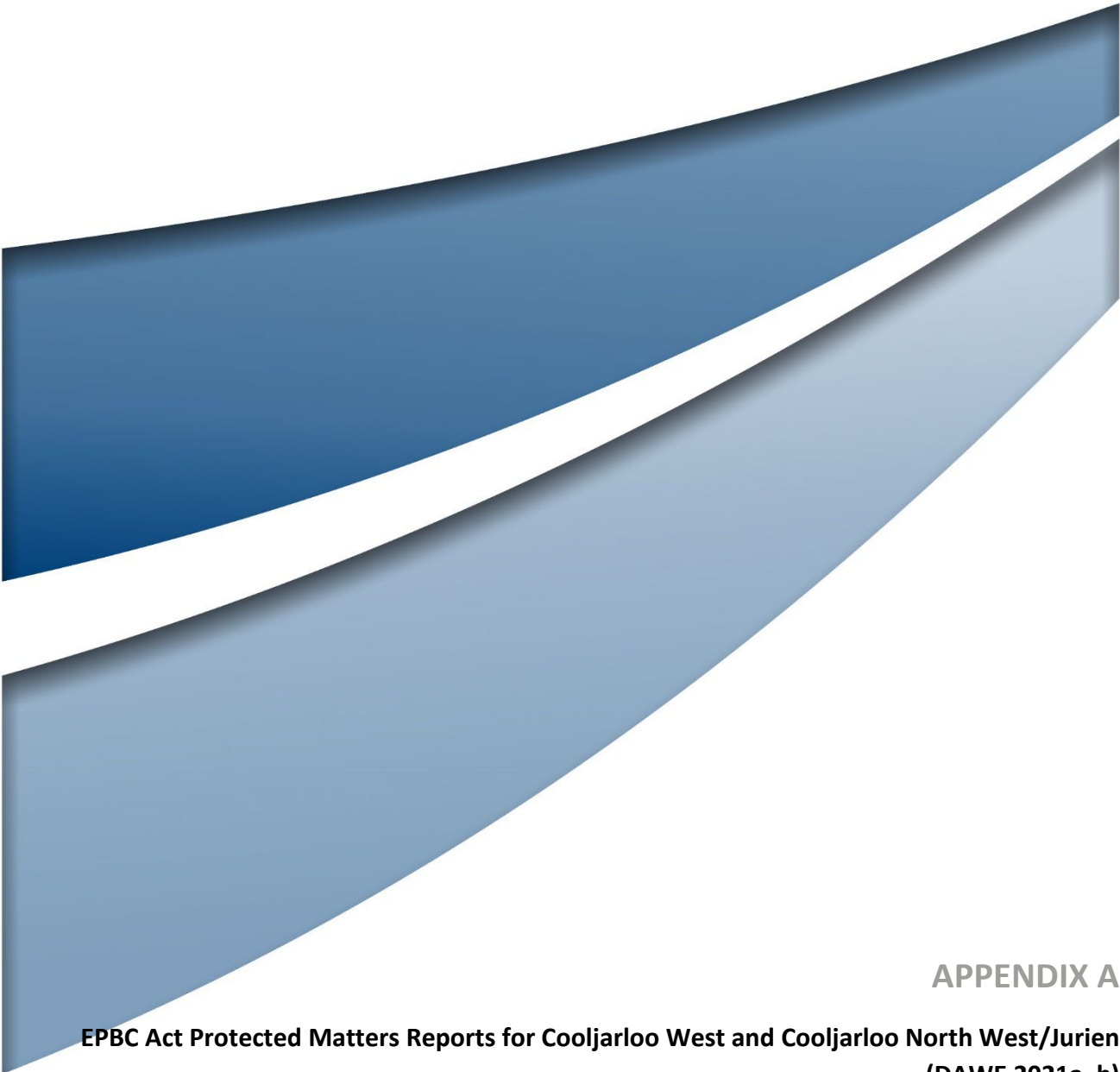
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**APPENDIX A**

**EPBC Act Protected Matters Reports for Cooljarloo West and Cooljarloo North West/Jurien  
(DAWE 2021a, b)**



# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 18/10/21 13:36:38

[Summary](#)

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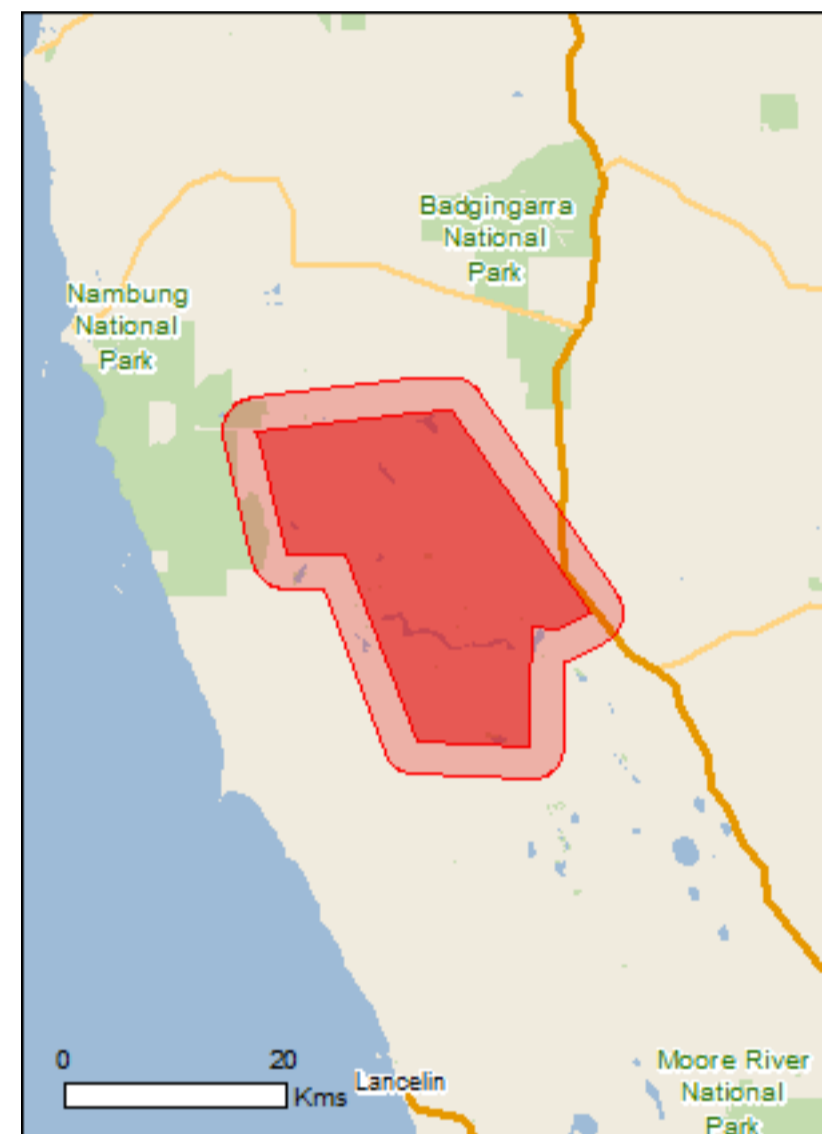
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[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

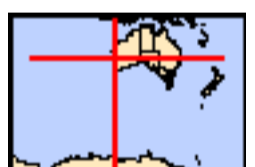
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# Summary

## Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	2
<a href="#">Listed Threatened Species:</a>	28
<a href="#">Listed Migratory Species:</a>	10

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

<a href="#">Commonwealth Land:</a>	1
<a href="#">Commonwealth Heritage Places:</a>	1
<a href="#">Listed Marine Species:</a>	15
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

## Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

<a href="#">State and Territory Reserves:</a>	4
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	18
<a href="#">Nationally Important Wetlands:</a>	1
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

### Listed Threatened Ecological Communities

[\[ Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
<a href="#">Banksia Woodlands of the Swan Coastal Plain ecological community</a>	Endangered	Community likely to occur within area
<a href="#">Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community</a>	Critically Endangered	Community likely to occur within area

### Listed Threatened Species

[\[ Resource Information \]](#)

Name	Status	Type of Presence
------	--------	------------------

#### Birds

<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calyptorhynchus latirostris</a> Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Bettongia penicillata ogilbyi</a> Woylie [66844]	Endangered	Species or species habitat likely to occur within area
<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Parantechinus apicalis</a> Dibbler [313]	Endangered	Species or species habitat may occur within



Name	Status	Type of Presence area
<b>Plants</b>		
<a href="#">Andersonia gracilis</a> Slender Andersonia [14470]	Endangered	Species or species habitat known to occur within area
<a href="#">Anigozanthos viridis subsp. terraspectans</a> Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Chamelaucium sp. Gingin (N.G.Marchant 6)</a> Gingin Wax [88881]	Endangered	Species or species habitat may occur within area
<a href="#">Drakaea elastica</a> Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
<a href="#">Eucalyptus dolorosa</a> Dandaragan Mallee, Mount Misery Mallee [56709]	Endangered	Species or species habitat may occur within area
<a href="#">Eucalyptus impensa</a> Eneabba Mallee [56711]	Endangered	Species or species habitat likely to occur within area
<a href="#">Eucalyptus leprophloia</a> Scaly Butt Mallee, Scaly-butt Mallee [56712]	Endangered	Species or species habitat likely to occur within area
<a href="#">Eucalyptus x balanites</a> Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat may occur within area
<a href="#">Grevillea batrachioides</a> Mt Lesueur Grevillea [21735]	Endangered	Species or species habitat likely to occur within area
<a href="#">Grevillea calliantha</a> Foote's Grevillea, Cataby Grevillea, Black Magic Grevillea [56339]	Endangered	Species or species habitat may occur within area
<a href="#">Grevillea curviloba subsp. incurva</a> Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat may occur within area
<a href="#">Hakea megalosperma</a> Lesueur Hakea [10505]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Hemiandra gardneri</a> Red Snakebush [7945]	Endangered	Species or species habitat may occur within area
<a href="#">Leucopogon obtectus</a> Hidden Beard-heath [19614]	Endangered	Species or species habitat may occur within area
<a href="#">Macarthuria keigheryi</a> Keighery's Macarthuria [64930]	Endangered	Species or species habitat likely to occur within area
<a href="#">Paracaleana dixonii</a> Sandplain Duck Orchid [86882]	Endangered	Species or species habitat may occur within area
<a href="#">Ptychosema pusillum</a> Dwarf Pea [11268]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Thelymitra stellata</a> Star Sun-orchid [7060]	Endangered	Species or species habitat may occur within

Name	Status	Type of Presence area
<b>Listed Migratory Species</b>		<a href="#">[ Resource Information ]</a>
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Apus pacificus</a>		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Motacilla cinerea</a>		
Grey Wagtail [642]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a>		
Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a>		
Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
<a href="#">Calidris canutus</a>		
Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris ferruginea</a>		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a>		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a>		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a>		
Osprey [952]		Species or species habitat likely to occur within area
<a href="#">Tringa nebularia</a>		
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

## Other Matters Protected by the EPBC Act

### Commonwealth Land [\[ Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

### Commonwealth Heritage Places [\[ Resource Information \]](#)

Name	State	Status
<b>Natural</b>		
<a href="#">Lancelin Defence Training Area</a>	WA	Listed place

### Listed Marine Species [\[ Resource Information \]](#)

\* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a>		
Common Sandpiper [59309]		Species or species

Name	Threatened	Type of Presence
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		habitat may occur within area  Species or species habitat likely to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Chrysococcyx osculans</a> Black-eared Cuckoo [705]		Species or species habitat known to occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat likely to occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

## Extra Information

### State and Territory Reserves [\[ Resource Information \]](#)

Name	State
Nambung	WA
Unnamed WA40916	WA
Unnamed WA41986	WA
Wongonderrah	WA

### Invasive Species [\[ Resource Information \]](#)

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
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#### Birds

Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area

#### Mammals

Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area

#### Plants

Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within

Name	Status	Type of Presence
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		area  Species or species habitat may occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
<b>Nationally Important Wetlands</b>		<b>[ Resource Information ]</b>
Name		State
<a href="#">Lancelin Defence Training Area</a>		WA

# Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

# Coordinates

-30.570034 115.215922,-30.557027 115.345012,-30.555844 115.375224,-30.69706 115.487147,-30.708278 115.461741,-30.706507 115.440455,-30.758446 115.438396,-30.790304 115.439082,-30.786764 115.346385,-30.656903 115.289393,-30.656903 115.239955,-30.570625 115.216609,-30.570034 115.215922

# Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 18/10/21 13:24:23

[Summary](#)

[Details](#)

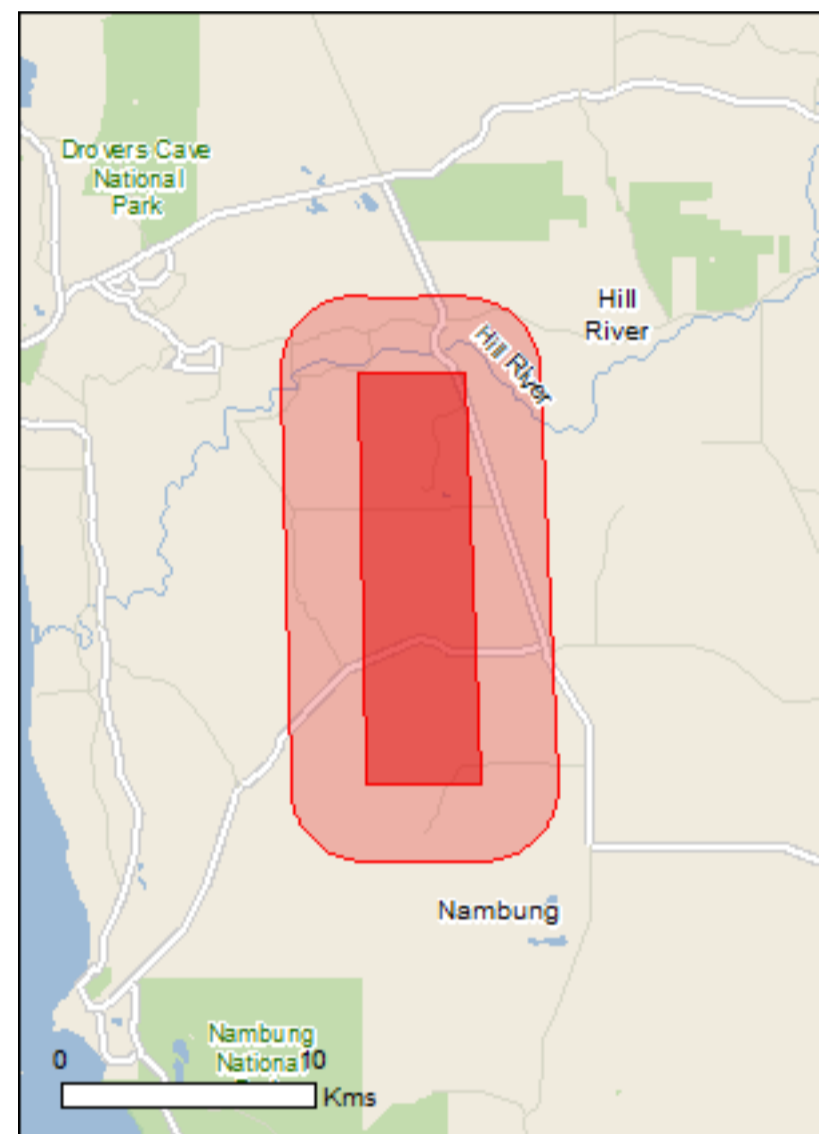
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

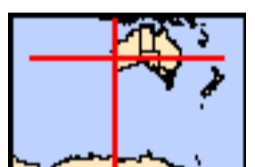
[Acknowledgements](#)



This map may contain data which are  
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[Coordinates](#)

[Buffer: 3.0Km](#)





# Summary

## Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	2
<a href="#">Listed Threatened Species:</a>	23
<a href="#">Listed Migratory Species:</a>	9

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	14
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

## Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

<a href="#">State and Territory Reserves:</a>	3
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	18
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

### Listed Threatened Ecological Communities

[\[ Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
<a href="#">Banksia Woodlands of the Swan Coastal Plain ecological community</a>	Endangered	Community likely to occur within area
<a href="#">Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community</a>	Critically Endangered	Community likely to occur within area

### Listed Threatened Species

[\[ Resource Information \]](#)

Name	Status	Type of Presence
------	--------	------------------

#### Birds

<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calyptorhynchus latirostris</a> Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Bettongia penicillata ogilbyi</a> Woylie [66844]	Endangered	Species or species habitat may occur within area
<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Parantechinus apicalis</a> Dibbler [313]	Endangered	Species or species habitat may occur within

Name	Status	Type of Presence area
<b>Plants</b>		
<a href="#">Andersonia gracilis</a> Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area
<a href="#">Anigozanthos viridis subsp. terraspectans</a> Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Caladenia hoffmanii</a> Hoffman's Spider-orchid [56719]	Endangered	Species or species habitat may occur within area
<a href="#">Drakaea elastica</a> Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat may occur within area
<a href="#">Eucalyptus argutifolia</a> Yanchep Mallee, Wabling Hill Mallee [24263]	Vulnerable	Species or species habitat may occur within area
<a href="#">Eucalyptus impensa</a> Eneabba Mallee [56711]	Endangered	Species or species habitat may occur within area
<a href="#">Eucalyptus leprophloia</a> Scaly Butt Mallee, Scaly-butt Mallee [56712]	Endangered	Species or species habitat may occur within area
<a href="#">Eucalyptus x balanites</a> Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat may occur within area
<a href="#">Grevillea humifusa</a> Spreading Grevillea [61182]	Endangered	Species or species habitat known to occur within area
<a href="#">Hakea megalosperma</a> Lesueur Hakea [10505]	Vulnerable	Species or species habitat may occur within area
<a href="#">Hemiandra gardneri</a> Red Snakebush [7945]	Endangered	Species or species habitat likely to occur within area
<a href="#">Paracaleana dixonii</a> Sandplain Duck Orchid [86882]	Endangered	Species or species habitat likely to occur within area
<a href="#">Thelymitra stellata</a> Star Sun-orchid [7060]	Endangered	Species or species habitat may occur within area
<b>Listed Migratory Species</b>		<b>[ Resource Information ]</b>
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat may occur within area

## Other Matters Protected by the EPBC Act

### Listed Marine Species [\[ Resource Information \]](#)

\* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Chrysococcyx osculans</a> Black-eared Cuckoo [705]		Species or species habitat known to occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat may occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

## Extra Information

State and Territory Reserves	[ <a href="#">Resource Information</a> ]
Name	State
Hill River	WA
Southern Beekeepers	WA
Unnamed WA33287	WA

## Invasive Species [ [Resource Information](#) ]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
<b>Birds</b>		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
<b>Mammals</b>		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
<b>Plants</b>		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

# Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

# Coordinates

-30.309258 115.165454,-30.308962 115.202876,-30.434553 115.209399,-30.434553 115.168544,-30.308666 115.165111,-30.309258 115.165454

# Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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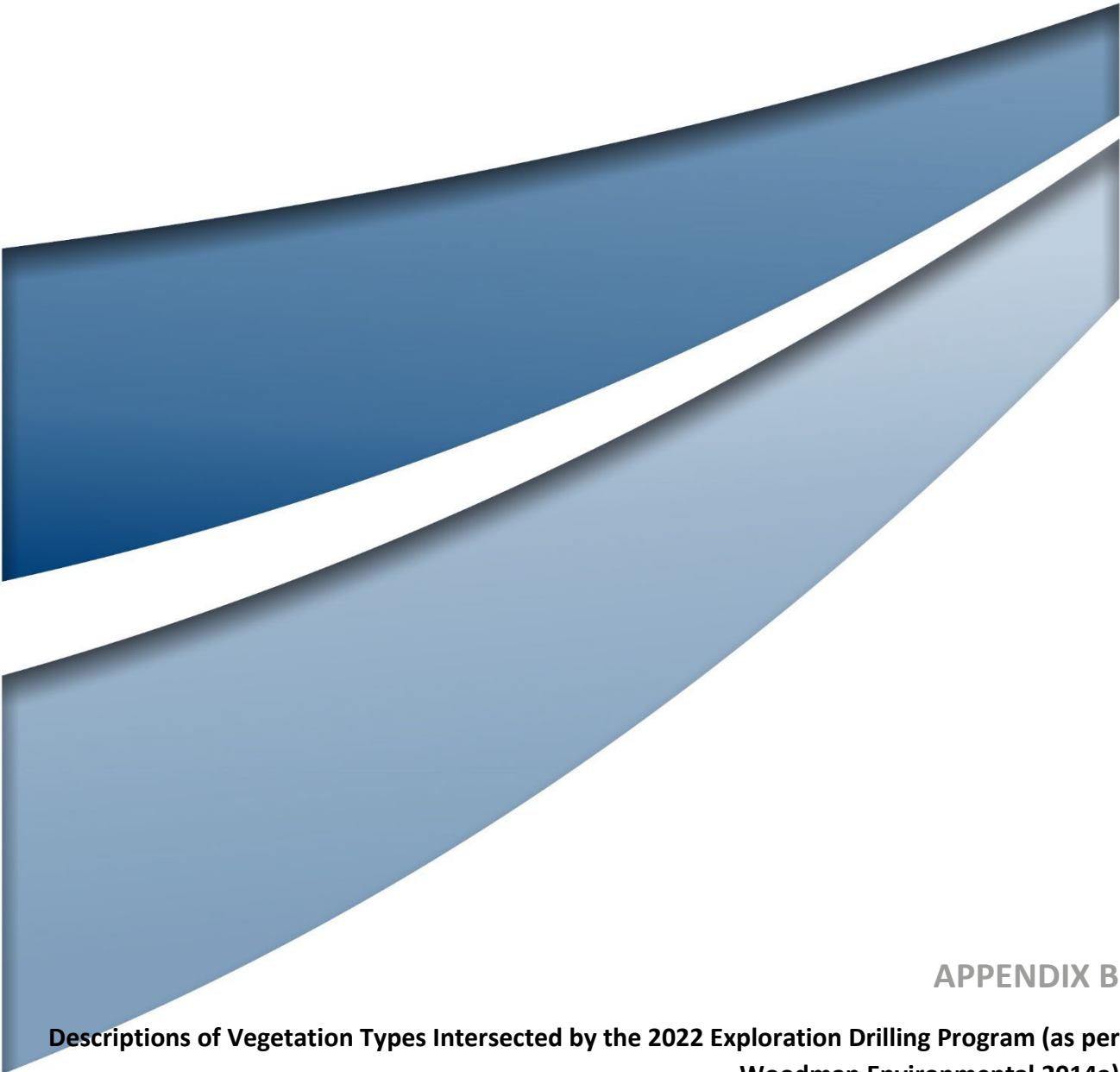
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**APPENDIX B**

**Descriptions of Vegetation Types Intersected by the 2022 Exploration Drilling Program (as per Woodman Environmental 2014a)**

Note: Conservation Significance Ratings are defined in Table B1.

**VT 1 (Local Conservation Significance Ranking – Moderate)**

Low Open Heathland to Mid Closed Heathland of *Acacia lasiocarpa* var. *lasiocarpa*, *Banksia telmatiaea*, *Melaleuca seriata*, *Hakea obliqua* subsp. *parviflora*, *Regelia ciliata* and/or *Verticordia densiflora* var. *densiflora*, often with Mid Isolated Clumps of Shrubs to Mid Sparse Shrubland of *Melaleuca raphiophylla* on white-grey to grey-brown sand, sandy loam or sandy clay in broad damp depressions on flat to gently undulating plains.

**VT 5 (Local Conservation Significance Ranking – High)**

Low Heathland to Mid Closed Heathland of *Banksia telmatiaea*, *Hakea obliqua* subsp. *parviflora*, *Melaleuca seriata* and/or *Regelia ciliata* on white-grey to grey-brown sand, sandy loam, sandy clay or clay loam in broad damp depressions on flat to gently undulating plains.

**VT 6 (Local Conservation Significance Ranking – Very High)**

Low Isolated Clumps of Trees to Low Woodland of *Banksia attenuata*, *Banksia menziesii* and/or *Banksia ilicifolia* over Low Sparse Shrubland to Mid Closed Shrubland of *Adenanthos cygnorum* subsp. *cygnorum*, *Banksia telmatiaea*, *Beaufortia squarrosa*, *Hypocalymma angustifolium*, *Jacksonia nutans* and/or *Melaleuca seriata* over Low Isolated Clumps of Sedges to Mid Sedgeland of *Anarthria laevis* and/or Low Isolated Clumps of Rushes of *Chordifex sinuosus* on white-grey to grey-brown sand in damp depressions.

**VT 9b (Local Conservation Significance Ranking – Very High)**

Low Woodland to Mid Open Forest of *Eucalyptus rudis* subsp. *rudis* over Low Isolated Clumps of Trees to Low Closed Forest of *Melaleuca raphiophylla*, often with Tall Sparse Shrubland to Tall Shrubland of *Acacia saligna* subsp. *lindleyi*, over Low Isolated Clumps of Forbs to Low Closed Forbland of *\*Galium murale*, *\*Hypochaeris glabra*, *\*Lysimachia arvensis* and *Trachymene pilosa* on grey to grey-black sand, sandy loam, sandy clay or clayey sand in wetlands, broad shallow basins/depressions and drainage lines.

**VT 17 (Local Conservation Significance Ranking – Moderate)**

Low Isolated Clumps of Trees to Low Open Forest of *Banksia attenuata*, *Banksia menziesii* and *Eucalyptus todtiana* over Mid Isolated Clumps of Shrubs to Mid Shrubland of *Adenanthos cygnorum* subsp. *cygnorum*, *Eremaea pauciflora*, *Jacksonia floribunda*, *Jacksonia nutans*, *Stirlingia latifolia* and *Xanthorrhoea preissii* over Low Isolated Clumps of Shrubs to Low Shrubland of *Bossiaea eriocarpa*, *Dasyopogon obliquifolius*, *Eremaea asterocarpa* subsp. *asterocarpa*, *Eremaea pauciflora*, *Hibbertia crassifolia*, *Hibbertia hypericoides*, *Jacksonia nutans*, *Melaleuca clavifolia*, *Patersonia occidentalis* var. *?occidentalis* and *Petrophile linearis* over Low Isolated Clumps of Sedges to Mid Open Sedgeland of *Mesomelaena pseudostygia* on white or grey sand on undulating plains and low dunes.

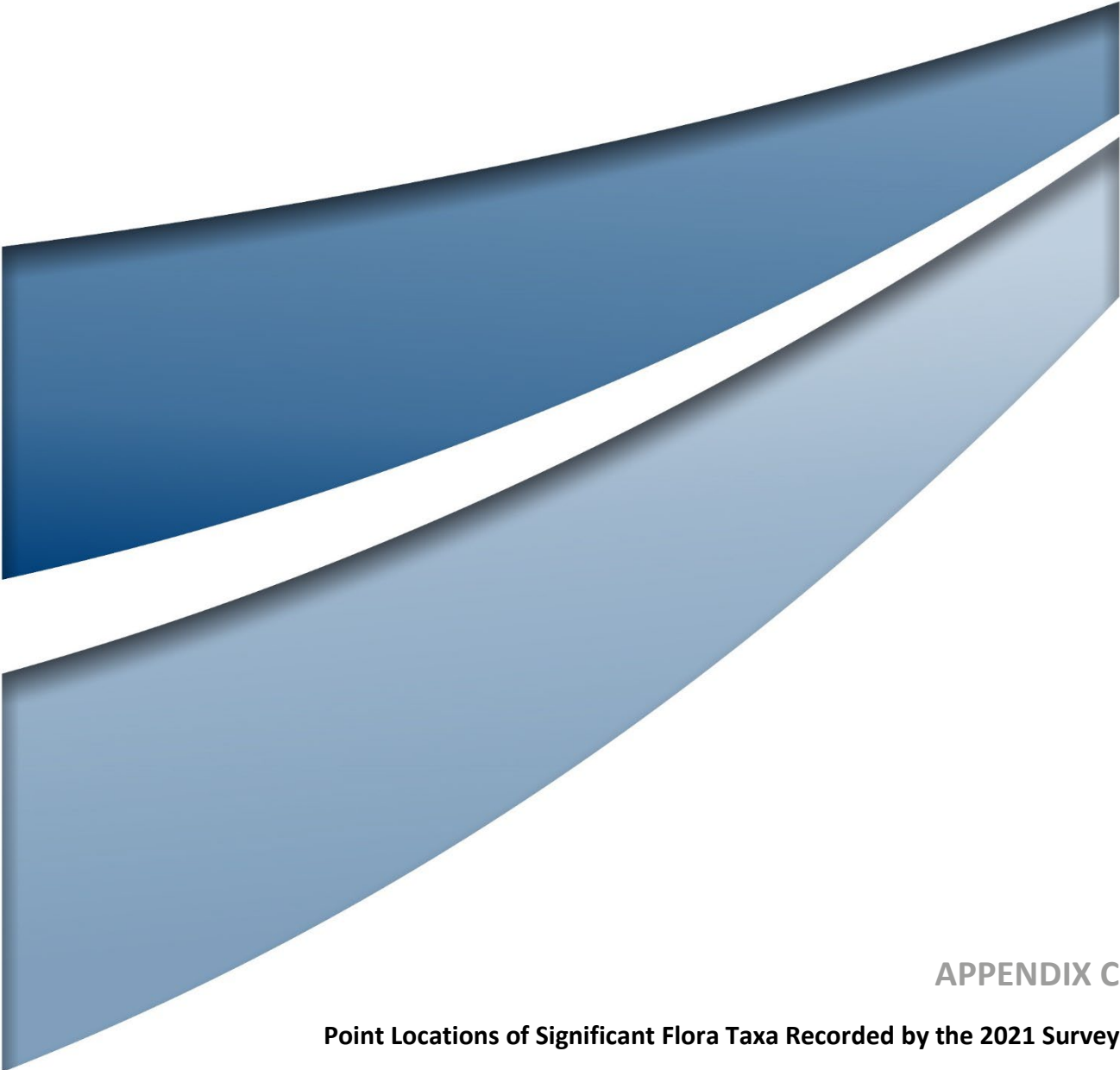
**VT 18 (Conservation Significance Ranking – Moderate)**

Low Isolated Clumps of Trees to Low Open Forest of *Banksia attenuata* and *Banksia menziesii* over Mid Isolated Clumps of Shrubs to Mid Shrubland of *Allocasuarina humilis*, *Conospermum stoechadis* subsp. *stoechadis*, *Eremaea pauciflora*, *Hakea costata* and/or *Xanthorrhoea preissii* over Low Isolated Clumps of Shrubs to Low Closed Shrubland of *Bossiaea eriocarpa*, *Calothamnus sanguineus*, *Dasyopogon obliquifolius*, *Eremaea pauciflora*, *Hibbertia hypericoides*, *Jacksonia nutans* and/or *Melaleuca clavifolia* over Low Isolated Clumps of Sedges to Mid Open Sedgeland of *Mesomelaena pseudostygia* on grey to yellow-grey sand on

undulating plains and low dunes or white-grey to grey-brown sand, sandy loam or sandy clay loam on simple slopes, open depressions or flats within undulating plains.

**Table B1: Descriptions of Conservation Significance Rankings of Vegetation Types - Cooljarloo**

Conservation Significance Ranking	Description
Very Low	<ul style="list-style-type: none"> <li>The VT is very widespread through the Study Area (occupies &gt; 30 % of the Study Area) and</li> <li>VT does not represent preferred habitat for Threatened Flora, and such flora has not been recorded in the VT</li> </ul>
Low	<ul style="list-style-type: none"> <li>The VT is widespread through the Study Area (occupies &gt; 10 % of the Study Area) and</li> <li>VT does not represent preferred habitat for Threatened Flora, and such flora taxa have not been recorded in the VT</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>The VT is widespread through the Study Area (occupies &gt; 10 % of the Study Area) and</li> <li>VT does represent preferred habitat for Threatened Flora, and such flora taxa have been recorded in the VT</li> </ul>
High	<ul style="list-style-type: none"> <li>The VT is moderately restricted in the Study Area (occupies &lt; 10 % of the Study Area or</li> <li>VT is mapped on a relatively restricted landform type (i.e. claypans, areas with lateritic substrate) and</li> <li>VT may represent preferred habitat for Threatened flora, and such flora have been recorded in VT</li> </ul>
Very High	<ul style="list-style-type: none"> <li>The VT corresponds with a State or Commonwealth listed Threatened Ecological Community or Priority Ecological Community or</li> <li>The VT is highly restricted in the Study Area (occupies &lt; 1 % of the Study Area) and</li> <li>The VT is preferred habitat for Threatened Flora species, or flora taxa ranked as P1 or P2</li> </ul>



**APPENDIX C**

**Point Locations of Significant Flora Taxa Recorded by the 2021 Survey**

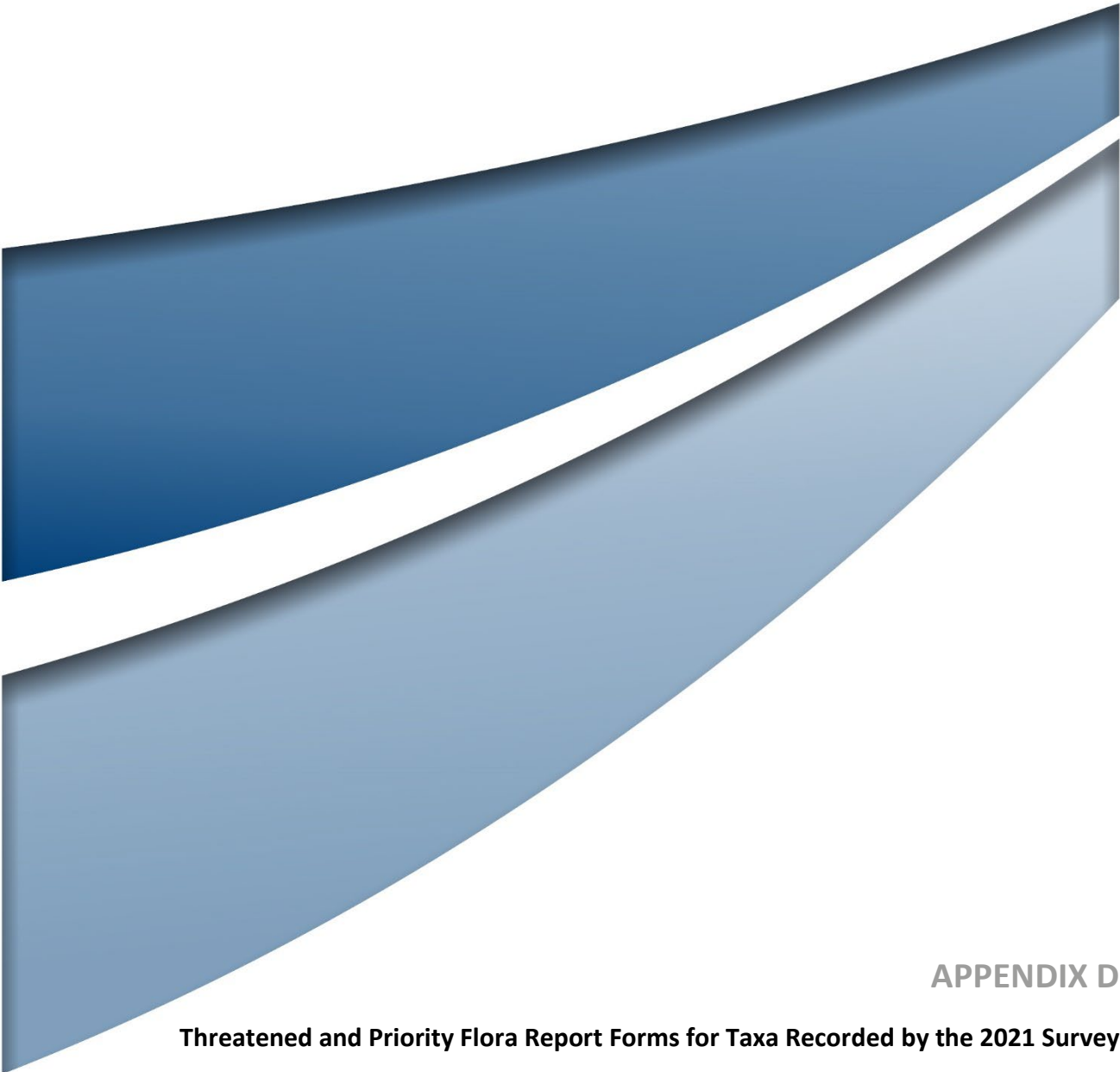
**NOTE: FOR AGENCY REFERENCE ONLY, CONTAINS DETAIL ON SIGNIFICANT FLORA LOCATIONS**

All GPS co-ordinates in GDA94 Zone 50

Taxon	Status	Easting	Northing	Count	Location
<i>Arnocrinum gracillimum</i>	P3	344608	6617912	1	CLW_22_22
<i>Arnocrinum gracillimum</i>	P3	344491	6617840	2	CLW_22_22
<i>Arnocrinum gracillimum</i>	P3	344471	6617825	2	CLW_22_22
<i>Arnocrinum gracillimum</i>	P3	344461	6617813	3	CLW_22_22
<i>Arnocrinum gracillimum</i>	P3	344443	6617803	1	CLW_22_22
<i>Arnocrinum gracillimum</i>	P3	344406	6617783	2	CLW_22_22
<i>Arnocrinum gracillimum</i>	P3	344335	6617729	1	CLW_22_22
<i>Arnocrinum gracillimum</i>	P3	344279	6617690	1	CLW_22_22
<i>Arnocrinum gracillimum</i>	P3	344194	6617627	1	CLW_22_22
<i>Arnocrinum gracillimum</i>	P3	344173	6617615	1	CLW_22_22
<i>Arnocrinum gracillimum</i>	P3	344153	6617604	1	CLW_22_22
<i>Arnocrinum gracillimum</i>	P3	344136	6617588	2	CLW_22_22
<i>Arnocrinum gracillimum</i>	P3	344175	6617804	1	CLW_22_22
<i>Babingtonia urbana</i>	P3	344345	6610148	18	CLW_22_07
<i>Babingtonia urbana</i>	P3	344340	6610146	16	CLW_22_07
<i>Babingtonia urbana</i>	P3	344331	6610133	2	CLW_22_07
<i>Babingtonia urbana</i>	P3	344326	6610134	7	CLW_22_07
<i>Babingtonia urbana</i>	P3	344316	6610128	2	CLW_22_07
<i>Babingtonia urbana</i>	P3	344139	6610503	1	CLW_22_08
<i>Babingtonia urbana</i>	P3	344158	6610515	4	CLW_22_08
<i>Babingtonia urbana</i>	P3	344174	6610532	4	CLW_22_08
<i>Babingtonia urbana</i>	P3	344177	6610536	1	CLW_22_08
<i>Beaufortia bicolor</i>	P3	344608	6617912	2	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344578	6617891	2	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344561	6617876	1	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344526	6617860	1	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344511	6617849	1	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344504	6617840	8	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344491	6617840	2	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344490	6617831	5	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344471	6617825	2	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344452	6617812	8	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344443	6617803	1	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344435	6617794	14	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344420	6617789	14	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344406	6617783	15	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344396	6617771	3	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344380	6617755	8	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344361	6617746	9	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344352	6617738	4	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344335	6617729	25	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344323	6617721	13	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344303	6617708	12	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344290	6617697	16	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344279	6617690	4	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344267	6617684	16	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344248	6617672	9	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344232	6617661	16	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344222	6617651	9	CLW_22_22

Taxon	Status	Easting	Northing	Count	Location
<i>Beaufortia bicolor</i>	P3	344209	6617642	1	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344184	6617627	23	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344173	6617615	12	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344153	6617604	9	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344136	6617588	21	CLW_22_22
<i>Beaufortia bicolor</i>	P3	344115	6617577	20	CLW_22_22
<i>Chordifex reseminans</i>	P2	344531	6610297	2	CLW_22_07
<i>Chordifex reseminans</i>	P2	344521	6610289	3	CLW_22_07
<i>Chordifex reseminans</i>	P2	344516	6610286	4	CLW_22_07
<i>Chordifex reseminans</i>	P2	344499	6610274	1	CLW_22_07
<i>Chordifex reseminans</i>	P2	344106	6610478	6	CLW_22_08
<i>Chordifex reseminans</i>	P2	344108	6610481	8	CLW_22_08
<i>Chordifex reseminans</i>	P2	344118	6610485	7	CLW_22_08
<i>Chordifex reseminans</i>	P2	344141	6610503	14	CLW_22_08
<i>Chordifex reseminans</i>	P2	344149	6610511	10	CLW_22_08
<i>Chordifex reseminans</i>	P2	344174	6610532	1	CLW_22_08
<i>Chordifex reseminans</i>	P2	344177	6610536	5	CLW_22_08
<i>Chordifex reseminans</i>	P2	344128	6610993	1	CLW_22_10
<i>Chordifex reseminans</i>	P2	343426	6611475	1	CLW_22_15
<i>Chordifex reseminans</i>	P2	343141	6611641	2	CLW_22_18
<i>Chordifex reseminans</i>	P2	343122	6611623	3	CLW_22_18
<i>Chordifex reseminans</i>	P2	343105	6611611	5	CLW_22_18
<i>Chordifex reseminans</i>	P2	343071	6611702	1	CLW_22_19
<i>Chordifex reseminans</i>	P2	343103	6611731	1	CLW_22_19
<i>Chordifex reseminans</i>	P2	343132	6611750	1	CLW_22_19
<i>Chordifex reseminans</i>	P2	343135	6611754	2	CLW_22_19
<i>Chordifex reseminans</i>	P2	343135	6611754	1	CLW_22_19
<i>Conostephium magnum</i>	P4	350699	6602508	10	CLW_22_05
<i>Conostephium magnum</i>	P4	350688	6602501	5	CLW_22_05
<i>Conostephium magnum</i>	P4	350672	6602492	1	CLW_22_05
<i>Conostephium magnum</i>	P4	350664	6602484	12	CLW_22_05
<i>Conostephium magnum</i>	P4	350641	6602469	9	CLW_22_05
<i>Conostephium magnum</i>	P4	350610	6602440	1	CLW_22_05
<i>Conostephium magnum</i>	P4	350584	6602419	1	CLW_22_05
<i>Conostephium magnum</i>	P4	350576	6602414	5	CLW_22_05
<i>Conostephium magnum</i>	P4	350559	6602402	8	CLW_22_05
<i>Conostephium magnum</i>	P4	350548	6602399	7	CLW_22_05
<i>Conostephium magnum</i>	P4	350539	6602392	21	CLW_22_05
<i>Conostephium magnum</i>	P4	350527	6602383	22	CLW_22_05
<i>Conostephium magnum</i>	P4	350508	6602371	11	CLW_22_05
<i>Grevillea</i> sp. Cooljarloo (B.J. Keighery 28 B)	P1	343479	6611409	1	CLW_22_14
<i>Grevillea</i> sp. Cooljarloo (B.J. Keighery 28 B)	P1	343491	6611419	1	CLW_22_14
<i>Grevillea</i> sp. Cooljarloo (B.J. Keighery 28 B)	P1	343524	6611445	7	CLW_22_14
<i>Hensmania stoniella</i>	P3	326718	6640205	1	CNW_22_04
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	344916	6609832	3	CLW_22_06
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	344910	6609825	1	CLW_22_06
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	344377	6610174	2	CLW_22_07
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	344344	6610146	1	CLW_22_07
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	344316	6610128	1	CLW_22_07
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	343241	6611592	1	CLW_22_17
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	342269	6612115	1	CLW_22_20

Taxon	Status	Easting	Northing	Count	Location
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	342260	6612107	1	CLW_22_20
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	342251	6612102	1	CLW_22_20
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	343402	6616907	1	CLW_22_21
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	343395	6616898	1	CLW_22_21
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	P3	343369	6616886	1	CLW_22_21
<i>Poranthera asybosca</i>	P1	342392	6612210	30	CLW_22_20
<i>Poranthera asybosca</i>	P1	343470	6616944	30	CLW_22_21
<i>Schoenus griffinianus</i>	P4	326692	6640211	1	CNW_22_04
<i>Schoenus pennisetis</i>	P4	343063	6611734	1	CLW_22_19
<i>Stylidium hymanocraspedum</i>	P3	344198	6617637	4	CLW_22_22
<i>Stylidium hymanocraspedum</i>	P3	344186	6617635	6	CLW_22_22
<i>Stylidium hymanocraspedum</i>	P3	344184	6617627	1	CLW_22_22
<i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>	P4	343107	6611616	2	CLW_22_18
<i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>	P4	343105	6611611	2	CLW_22_18
<i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>	P4	343111	6611735	1	CLW_22_19
<i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>	P4	342294	6612137	1	CLW_22_20



**APPENDIX D**

**Threatened and Priority Flora Report Forms for Taxa Recorded by the 2021 Survey**

**NOTE: FOR AGENCY REFERENCE ONLY, CONTAINS DETAIL ON SIGNIFICANT FLORA LOCATIONS**





# Threatened and Priority Flora Report Form

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au/> under *Standard Report Forms*

<b>TAXON:</b> <u>Arnocrinum gracillimum</u>		<b>TPFL Pop. No.:</b> _____	
<b>OBSERVATION DATE:</b> <u>28/10/2021</u>	<b>CONSERVATION STATUS:</b> <u>P3</u>		New population <input type="checkbox"/>
<b>OBSERVER/S:</b> <u>David Coultas, Taylah Hanks</u>		<b>PHONE:</b> <u>9315 4688</u>	
<b>ROLE:</b> <u>Princippal Botanist and Graduate Botanist</u>		<b>ORGANISATION:</b> <u>Umwelt Australia</u>	

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):  
North of Tronox's Cooljarloo mine site, approximately 480m south of Wongonderrah Road and 7.9 km westsouthwest of the intersection between Wongonderrah Road and Brand Highway

<b>DBC DISTRICT:</b> <u>Moora</u>		<b>LGA:</b> <u>Dandaragan</u>	<b>Reserve No.:</b> _____
<b>DATUM:</b>		<b>COORDINATES:</b> (If UTM coords provided, Zone is also required)	<b>METHOD USED:</b>
GDA94 / MGA94 <input checked="" type="checkbox"/>	DecDegrees <input type="checkbox"/>	DegMinSec <input type="checkbox"/>	UTMs <input checked="" type="checkbox"/>
AGD84 / AMG84 <input type="checkbox"/>	<b>Lat / Northing:</b> <u>6617912</u>		GPS <input checked="" type="checkbox"/>
WGS84 <input type="checkbox"/>	<b>Long / Easting:</b> <u>344608.026</u>		Differential GPS <input type="checkbox"/>
Unknown <input type="checkbox"/>	<b>ZONE:</b> <u>50</u>		Map <input type="checkbox"/>
<b>LAND TENURE:</b>		Land manager present: <input type="checkbox"/>	
Nature reserve <input type="checkbox"/>	Timber reserve <input type="checkbox"/>	Private property <input type="checkbox"/>	Rail reserve <input type="checkbox"/>
National park <input type="checkbox"/>	State forest <input type="checkbox"/>	Pastoral lease <input type="checkbox"/>	MRWA road reserve <input type="checkbox"/>
Conservation park <input type="checkbox"/>	Water reserve <input type="checkbox"/>	UCL <input checked="" type="checkbox"/>	SLK/Pole _____ to _____
		Shire road reserve <input type="checkbox"/>	
		Other Crown reserve <input type="checkbox"/>	
		Specify other: _____	

<b>AREA ASSESSMENT:</b> Edge survey <input type="checkbox"/>		Partial survey <input checked="" type="checkbox"/>	Full survey <input type="checkbox"/>	Area observed (m <sup>2</sup> ): _____
<b>EFFORT:</b> Time spent surveying (minutes): _____		No. of minutes spent / 100 m <sup>2</sup> : _____		
<b>POP'N COUNT ACCURACY:</b> Actual <input checked="" type="checkbox"/>		Extrapolation <input type="checkbox"/>	Estimate <input type="checkbox"/>	Count method: _____
<b>WHAT COUNTED:</b>		Plants <input checked="" type="checkbox"/>	Clumps <input type="checkbox"/>	Clonal stems <input type="checkbox"/>
<b>TOTAL POP'N STRUCTURE:</b>	<b>Mature:</b>	<b>Juveniles:</b>	<b>Seedlings:</b>	<b>Totals:</b>
Alive	19			19
Dead				
<b>QUADRATS PRESENT:</b>		No. _____	Size _____	Data attached <input type="checkbox"/>
<b>Summary Quad. Totals: Alive</b>		Total area of quadrats (m <sup>2</sup> ): _____		
<b>REPRODUCTIVE STATE:</b>		Clonal <input type="checkbox"/>	Vegetative <input type="checkbox"/>	Flowerbud <input type="checkbox"/>
		Immature fruit <input type="checkbox"/>	Fruit <input type="checkbox"/>	Dehisced fruit <input type="checkbox"/>
		Flower <input type="checkbox"/>		
		Percentage in flower: _____%		

**CONDITION OF PLANTS:** Healthy  Moderate  Poor  Senescent

**COMMENT:** \_\_\_\_\_

THREATS - type, agent and supporting information:	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. <b>Specify agent</b> where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)			
• Clearing for drill line	N	M	S
• Mining	N	H	L
•	---	---	---

Please return completed form to **Species And Communities Branch DBCA**,  
 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: [flora.data@dbca.wa.gov.au](mailto:flora.data@dbca.wa.gov.au)

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.  
 Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database



# Threatened and Priority Flora Report Form

## HABITAT INFORMATION:

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Inundated

**VEGETATION CLASSIFICATION\*:**

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);  
 2. Open shrubland (Hibbertia sp., Acacia spp.);  
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (non-dominant) spp \_\_\_\_\_

\* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

**CONDITION OF HABITAT:** Pristine  Excellent  Very good  Good  Degraded  Completely degraded

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  No signs of fire

**FENCING:** Not required  Present  Replace / repair  Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Replace / reposition  Required  Quantity req'd: \_\_\_\_\_

**OTHER COMMENTS:** (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) \_\_\_\_\_

Shapefile of all locations recorded attached

\_\_\_\_\_

\_\_\_\_\_

Specimen not vouchered

\_\_\_\_\_

**DRF PERMIT/ LICENCE No:** Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Kyler Rowson Role: Graduate Botanist Signed: Kyler Rowson Date: 18/11/2021



# Threatened and Priority Flora Report Form

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au> under Standard Report Forms

<b>TAXON:</b> <u>Babingtonia urbana</u>		<b>TPFL Pop. No.:</b> _____	
<b>OBSERVATION DATE:</b> <u>27/10/2021</u>		<b>CONSERVATION STATUS:</b> <u>P3</u> New population <input type="checkbox"/>	
<b>OBSERVER/S:</b> <u>David Coultas, Taylah Hanks</u>		<b>PHONE:</b> <u>9315 4688</u>	
<b>ROLE:</b> <u>Prinicipal Botanist and Graduate Botanist</u>		<b>ORGANISATION:</b> <u>Umwelt Australia</u>	

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):  
West of Tronox's Cooljarloo mine site, approximately 8.2 km south of Wongonderrah Road and 11.5 km southwest of the intersection between Wongonderrah Road and Brand Highway

<b>DBC DISTRICT:</b> <u>Moora</u>		<b>LGA:</b> <u>Dandaragan</u>		<b>Reserve No.:</b> _____	
<b>DATUM:</b>		<b>COORDINATES:</b> (If UTM coords provided, Zone is also required)		<b>METHOD USED:</b>	
GDA94 / MGA94 <input checked="" type="checkbox"/>		DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM's <input checked="" type="checkbox"/>		GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>	
AGD84 / AMG84 <input type="checkbox"/>		<b>Lat / Northing:</b> <u>6610148</u>		No. satellites: _____    Map used: _____	
WGS84 <input type="checkbox"/>		<b>Long / Easting:</b> <u>344345.052</u>		Boundary polygon captured: <input type="checkbox"/> Map scale: _____	
Unknown <input type="checkbox"/>		<b>ZONE:</b> <u>50</u>			
<b>LAND TENURE:</b>					
Nature reserve <input type="checkbox"/>		Timber reserve <input type="checkbox"/>		Private property <input type="checkbox"/>	
National park <input type="checkbox"/>		State forest <input type="checkbox"/>		Pastoral lease <input type="checkbox"/>	
Conservation park <input type="checkbox"/>		Water reserve <input type="checkbox"/>		UCL <input checked="" type="checkbox"/>	
				Rail reserve <input type="checkbox"/>	
				MRWA road reserve <input type="checkbox"/>	
				SLK/Pole _____ to _____	
				Shire road reserve <input type="checkbox"/>	
				Other Crown reserve <input type="checkbox"/>	
				Specify other: _____	

<b>AREA ASSESSMENT:</b> Edge survey <input type="checkbox"/> Partial survey <input checked="" type="checkbox"/> Full survey <input type="checkbox"/>		Area observed (m <sup>2</sup> ): _____	
<b>EFFORT:</b> Time spent surveying (minutes): _____		No. of minutes spent / 100 m <sup>2</sup> : _____	
<b>POP'N COUNT ACCURACY:</b> Actual <input checked="" type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>		Count method: _____ (Refer to field manual for list)	
<b>WHAT COUNTED:</b> Plants <input checked="" type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>			
<b>TOTAL POP'N STRUCTURE:</b>			
	<b>Mature:</b>	<b>Juveniles:</b>	<b>Seedlings:</b>
Alive	55		55
Dead			
		Area of pop (m <sup>2</sup> ): _____	
		Note: Pls record count as numbers (not percentages) for database.	
<b>QUADRATS PRESENT:</b> No. _____    Size _____		Data attached <input type="checkbox"/> Total area of quadrats (m <sup>2</sup> ): _____	
<b>Summary Quad. Totals: Alive</b>			
<b>REPRODUCTIVE STATE:</b>			
Clonal <input type="checkbox"/> Vegetative <input type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input type="checkbox"/>			
Immature fruit <input type="checkbox"/> Fruit <input type="checkbox"/> Dehisced fruit <input type="checkbox"/> Percentage in flower: _____%			

**CONDITION OF PLANTS:**    Healthy     Moderate     Poor     Senescent

**COMMENT:** \_\_\_\_\_

THREATS - type, agent and supporting information:	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)			
• Clearing for drill line	N	M	S
• Mining	N	H	L
•	---	---	---



# Threatened and Priority Flora Report Form

## HABITAT INFORMATION:

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Inundated

**VEGETATION CLASSIFICATION\*:**

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);  
 2. Open shrubland (Hibbertia sp., Acacia spp.);  
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (non-dominant) spp \_\_\_\_\_

\* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

**CONDITION OF HABITAT:** Pristine  Excellent  Very good  Good  Degraded  Completely degraded

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  No signs of fire

**FENCING:** Not required  Present  Replace / repair  Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Replace / reposition  Required  Quantity req'd: \_\_\_\_\_

**OTHER COMMENTS:** (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) \_\_\_\_\_

Shapefile of all locations recorded attached

Specimen not vouchered

**DRF PERMIT/ LICENCE No:** Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Kyler Rowson Role: Graduate Botanist Signed: Kyler Rowson Date: 18/11/2021

Please return completed form to **Species And Communities Branch DBCA**, Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.  
 Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database



# Threatened and Priority Flora Report Form

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au> under Standard Report Forms

<b>TAXON:</b> <u>Beaufortia bicolor</u>		<b>TPFL Pop. No.:</b> _____	
<b>OBSERVATION DATE:</b> <u>28/10/2021</u>		<b>CONSERVATION STATUS:</b> <u>P3</u> New population <input type="checkbox"/>	
<b>OBSERVER/S:</b> <u>David Coultas, Taylah Hanks</u>		<b>PHONE:</b> <u>9315 4688</u>	
<b>ROLE:</b> <u>Prinicipal Botanist and Graduate Botanist</u>		<b>ORGANISATION:</b> <u>Umwelt Australia</u>	

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):  
North of Tronox's Cooljarloo mine site, approximately 485m south of Wongonderrah Road and 7.9 km westsouthwest of the intersection between Wongonderrah Road and Brand Highway

<b>DBC DISTRICT:</b> <u>Moora</u>		<b>LGA:</b> <u>Dandaragan</u>		<b>Reserve No.:</b> _____	
<b>DATUM:</b>		<b>COORDINATES:</b> (If UTM coords provided, Zone is also required)		<b>METHOD USED:</b>	
GDA94 / MGA94 <input checked="" type="checkbox"/>		DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM's <input checked="" type="checkbox"/>		GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>	
AGD84 / AMG84 <input type="checkbox"/>		<b>Lat / Northing:</b> <u>6617912.4</u>		No. satellites: _____    Map used: _____	
WGS84 <input type="checkbox"/>		<b>Long / Easting:</b> <u>344608.026</u>		Boundary polygon captured: <input type="checkbox"/> Map scale: _____	
Unknown <input type="checkbox"/>		<b>ZONE:</b> <u>50</u>			
<b>LAND TENURE:</b>					
Nature reserve <input type="checkbox"/>		Timber reserve <input type="checkbox"/>		Private property <input type="checkbox"/>	
National park <input type="checkbox"/>		State forest <input type="checkbox"/>		Pastoral lease <input type="checkbox"/>	
Conservation park <input type="checkbox"/>		Water reserve <input type="checkbox"/>		UCL <input checked="" type="checkbox"/>	
				Rail reserve <input type="checkbox"/>	
				MRWA road reserve <input type="checkbox"/>	
				SLK/Pole _____ to _____	
				Shire road reserve <input type="checkbox"/>	
				Other Crown reserve <input type="checkbox"/>	
				Specify other: _____	

<b>AREA ASSESSMENT:</b> Edge survey <input type="checkbox"/> Partial survey <input checked="" type="checkbox"/> Full survey <input type="checkbox"/>		Area observed (m <sup>2</sup> ): _____	
<b>EFFORT:</b> Time spent surveying (minutes): _____		No. of minutes spent / 100 m <sup>2</sup> : _____	
<b>POP'N COUNT ACCURACY:</b> Actual <input checked="" type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>		Count method: _____ (Refer to field manual for list)	
<b>WHAT COUNTED:</b> Plants <input checked="" type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>			
<b>TOTAL POP'N STRUCTURE:</b>			
	<b>Mature:</b>	<b>Juveniles:</b>	<b>Seedlings:</b>
Alive	306		306
Dead			
		Area of pop (m <sup>2</sup> ): _____	
		Note: Pls record count as numbers (not percentages) for database.	
<b>QUADRATS PRESENT:</b>			
No. _____    Size _____		Data attached <input type="checkbox"/> Total area of quadrats (m <sup>2</sup> ): _____	
<b>Summary Quad. Totals: Alive</b>			
<b>REPRODUCTIVE STATE:</b>			
Clonal <input type="checkbox"/> Vegetative <input type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input type="checkbox"/>			
Immature fruit <input type="checkbox"/> Fruit <input type="checkbox"/> Dehisced fruit <input type="checkbox"/> Percentage in flower: _____%			

**CONDITION OF PLANTS:**    Healthy     Moderate     Poor     Senescent

**COMMENT:** \_\_\_\_\_

THREATS - type, agent and supporting information:	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)			
• Clearing for drill line	N	M	S
• Mining	N	H	L
•	_____	_____	_____

Please return completed form to **Species And Communities Branch DBCA**,  
 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: [flora.data@dbca.wa.gov.au](mailto:flora.data@dbca.wa.gov.au)

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.  
 Record entered by: \_\_\_\_\_    Sheet No.: \_\_\_\_\_    Record Entered in Database



# Threatened and Priority Flora Report Form

## HABITAT INFORMATION:

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Inundated

**VEGETATION CLASSIFICATION\*:**

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);  
 2. Open shrubland (Hibbertia sp., Acacia spp.);  
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (non-dominant) spp \_\_\_\_\_

\* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

**CONDITION OF HABITAT:** Pristine  Excellent  Very good  Good  Degraded  Completely degraded

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  No signs of fire

**FENCING:** Not required  Present  Replace / repair  Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Replace / reposition  Required  Quantity req'd: \_\_\_\_\_

**OTHER COMMENTS:** (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) \_\_\_\_\_

Shapefile of all locations recorded attached

\_\_\_\_\_

\_\_\_\_\_

Specimen not vouchered

\_\_\_\_\_

**DRF PERMIT/ LICENCE No:** Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Kyler Rowson Role: Graduate Botanist Signed: Kyler Rowson Date: 18/11/2021

Please return completed form to **Species And Communities Branch DBCA**, Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch. Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database



# Threatened and Priority Flora Report Form

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au> under Standard Report Forms

<b>TAXON:</b>	Chordifex reseminans	<b>TPFL Pop. No.:</b>	
<b>OBSERVATION DATE:</b>	27/10/2021	<b>CONSERVATION STATUS:</b>	P2 <input type="checkbox"/> New population <input type="checkbox"/>
<b>OBSERVER/S:</b>	David Coultas, Taylah Hanks	<b>PHONE:</b>	9315 4688
<b>ROLE:</b>	Principal Botanist and Graduate Botanist	<b>ORGANISATION:</b>	Umwelt Australia

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):  
 West of Tronox's Cooljarloo mine site, approximately 8.1km south of Wongonderrah Road and 11.3km southwest of the intersection between Wongonderrah Road and Brand Highway

<b>DBC DISTRICT:</b> Moora		<b>LGA:</b> Dandaragan		<b>Reserve No.:</b>	
<b>DATUM:</b>		<b>COORDINATES:</b> (If UTM coords provided, Zone is also required)		<b>METHOD USED:</b>	
GDA94 / MGA94 <input checked="" type="checkbox"/>	DecDegrees <input type="checkbox"/>	DegMinSec <input type="checkbox"/>	UTMs <input checked="" type="checkbox"/>	GPS <input checked="" type="checkbox"/>	Differential GPS <input type="checkbox"/>
AGD84 / AMG84 <input type="checkbox"/>	<b>Lat / Northing:</b> 6610296.5		No. satellites: _____		Map used: _____
WGS84 <input type="checkbox"/>	<b>Long / Easting:</b> 344531.296		Boundary polygon captured: <input type="checkbox"/>		Map scale: _____
Unknown <input type="checkbox"/>	<b>ZONE:</b> 50				
<b>LAND TENURE:</b>					
Nature reserve <input type="checkbox"/>	Timber reserve <input type="checkbox"/>	Private property <input type="checkbox"/>	Rail reserve <input type="checkbox"/>	Shire road reserve <input type="checkbox"/>	
National park <input type="checkbox"/>	State forest <input type="checkbox"/>	Pastoral lease <input type="checkbox"/>	MRWA road reserve <input type="checkbox"/>	Other Crown reserve <input type="checkbox"/>	
Conservation park <input type="checkbox"/>	Water reserve <input type="checkbox"/>	UCL <input checked="" type="checkbox"/>	SLK/Pole _____ to _____	Specify other: _____	

<b>AREA ASSESSMENT:</b> Edge survey <input type="checkbox"/> Partial survey <input checked="" type="checkbox"/> Full survey <input type="checkbox"/> Area observed (m <sup>2</sup> ): _____			
<b>EFFORT:</b> Time spent surveying (minutes): _____		No. of minutes spent / 100 m <sup>2</sup> : _____	
<b>POP'N COUNT ACCURACY:</b> Actual <input checked="" type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/> Count method: _____ (Refer to field manual for list)			
<b>WHAT COUNTED:</b> Plants <input checked="" type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>			
<b>TOTAL POP'N STRUCTURE:</b>			
	<b>Mature:</b>	<b>Juveniles:</b>	<b>Seedlings:</b>
Alive	79		79
Dead			
Area of pop (m <sup>2</sup> ): _____			
Note: Pls record count as numbers (not percentages) for database.			
<b>QUADRATS PRESENT:</b> No. _____ Size _____ Data attached <input type="checkbox"/> Total area of quadrats (m <sup>2</sup> ): _____			
<b>Summary Quad. Totals: Alive</b>			
<b>REPRODUCTIVE STATE:</b> Clonal <input type="checkbox"/> Vegetative <input type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input type="checkbox"/> Immature fruit <input type="checkbox"/> Fruit <input type="checkbox"/> Dehisced fruit <input type="checkbox"/> Percentage in flower: _____%			

**CONDITION OF PLANTS:** Healthy  Moderate  Poor  Senescent

**COMMENT:** \_\_\_\_\_

THREATS - type, agent and supporting information:	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)			
• Clearing for drill line	N	M	S
• Mining	N	H	L
•	---	---	---

Please return completed form to **Species And Communities Branch DBCA**,  
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: [flora.data@dbca.wa.gov.au](mailto:flora.data@dbca.wa.gov.au)

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database



# Threatened and Priority Flora Report Form

**HABITAT INFORMATION:**

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Inundated

**VEGETATION CLASSIFICATION\*:**

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);  
 2. Open shrubland (Hibbertia sp., Acacia spp.);  
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (non-dominant) spp \_\_\_\_\_

\* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

**CONDITION OF HABITAT:** Pristine  Excellent  Very good  Good  Degraded  Completely degraded

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  No signs of fire

**FENCING:** Not required  Present  Replace / repair  Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Replace / reposition  Required  Quantity req'd: \_\_\_\_\_

**OTHER COMMENTS:** (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) \_\_\_\_\_

Shapefile of all locations recorded attached

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Specimen not vouchered

\_\_\_\_\_

**DRF PERMIT/ LICENCE No:** Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Kyler Rowson Role: Graduate Botanist Signed: Kyler Rowson Date: 18/11/2021

Please return completed form to **Species And Communities Branch DBCA**,  
 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.  
 Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database





# Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au/> under Standard Report Forms

<b>TAXON:</b> <u>Conostephium magnum</u>		<b>TPFL Pop. No.:</b> _____	
<b>OBSERVATION DATE:</b> <u>29/10/2021</u>		<b>CONSERVATION STATUS:</b> <u>P4</u> <span style="float:right">New population <input type="checkbox"/></span>	
<b>OBSERVER/S:</b> <u>David Coultas, Taylah Hanks</u>		<b>PHONE:</b> <u>9315 4688</u>	
<b>ROLE:</b> <u>Prinicipal Botanist and Graduate Botanist</u>		<b>ORGANISATION:</b> <u>Umwelt Australia</u>	

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):  
West of Tronox's Cooljarloo mine site, approximately 4km southeast of Woolka Road and 5.2km west of Brand Highway

<b>DBC DISTRICT:</b> <u>Moora</u>		<b>LGA:</b> <u>Dandaragan</u>		<b>Reserve No.:</b> _____	
<b>DATUM:</b>		<b>COORDINATES:</b> (If UTM coords provided, Zone is also required)		<b>METHOD USED:</b>	
GDA94 / MGA94 <input checked="" type="checkbox"/>		DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM's <input checked="" type="checkbox"/>		GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>	
AGD84 / AMG84 <input type="checkbox"/>		<b>Lat / Northing:</b> <u>6602507.68</u>		No. satellites: _____ Map used: _____	
WGS84 <input type="checkbox"/>		<b>Long / Easting:</b> <u>350699.42</u>		Boundary polygon captured: <input type="checkbox"/> Map scale: _____	
Unknown <input type="checkbox"/>		<b>ZONE:</b> <u>50</u>			
<b>LAND TENURE:</b>					
Nature reserve <input type="checkbox"/>		Timber reserve <input type="checkbox"/>		Private property <input type="checkbox"/>	
National park <input type="checkbox"/>		State forest <input type="checkbox"/>		Pastoral lease <input type="checkbox"/>	
Conservation park <input type="checkbox"/>		Water reserve <input type="checkbox"/>		UCL <input checked="" type="checkbox"/> SLK/Pole _____ to _____	
				Rail reserve <input type="checkbox"/> Shire road reserve <input type="checkbox"/>	
				MRWA road reserve <input type="checkbox"/> Other Crown reserve <input type="checkbox"/>	
				Specify other: _____	

**AREA ASSESSMENT:** Edge survey  Partial survey  Full survey  Area observed (m<sup>2</sup>): \_\_\_\_\_

**EFFORT:** Time spent surveying (minutes): \_\_\_\_\_ No. of minutes spent / 100 m<sup>2</sup>: \_\_\_\_\_

**POP'N COUNT ACCURACY:** Actual  Extrapolation  Estimate  Count method: \_\_\_\_\_  
(Refer to field manual for list)

**WHAT COUNTED:** Plants  Clumps  Clonal stems

<b>TOTAL POP'N STRUCTURE:</b>	<b>Mature:</b>	<b>Juveniles:</b>	<b>Seedlings:</b>	<b>Totals:</b>	Area of pop (m <sup>2</sup> ): _____ Note: Pls record count as numbers (not percentages) for database.
Alive	113			113	
Dead					

**QUADRATS PRESENT:** No. \_\_\_\_\_ Size \_\_\_\_\_ Data attached  Total area of quadrats (m<sup>2</sup>): \_\_\_\_\_

**Summary Quad. Totals:** Alive \_\_\_\_\_

**REPRODUCTIVE STATE:** Clonal  Vegetative  Flowerbud  Flower   
Immature fruit  Fruit  Dehisced fruit  Percentage in flower: \_\_\_\_\_%

**CONDITION OF PLANTS:** Healthy  Moderate  Poor  Senescent

**COMMENT:** \_\_\_\_\_

THREATS - type, agent and supporting information: <small>Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats &amp; agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (&lt;12mths), M=Medium (&lt;5yrs), L=Long (5yrs+)</small>	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
• Clearing for drill line	N	M	S
• Mining	N	H	L
•	_____	_____	_____

Please return completed form to **Species And Communities Branch DBCA**,  
 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: [flora.data@dbca.wa.gov.au](mailto:flora.data@dbca.wa.gov.au)

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.  
 Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database



# Threatened and Priority Flora Report Form

**HABITAT INFORMATION:**

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Inundated

**VEGETATION CLASSIFICATION\*:**

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);  
 2. Open shrubland (Hibbertia sp., Acacia spp.);  
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (non-dominant) spp \_\_\_\_\_

\* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

**CONDITION OF HABITAT:** Pristine  Excellent  Very good  Good  Degraded  Completely degraded

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  No signs of fire

**FENCING:** Not required  Present  Replace / repair  Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Replace / reposition  Required  Quantity req'd: \_\_\_\_\_

**OTHER COMMENTS:** (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) \_\_\_\_\_

Shapefile of all locations recorded attached

\_\_\_\_\_

\_\_\_\_\_

Specimen not vouchered

**DRF PERMIT/ LICENCE No:** Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Kyler Rowson Role: Graduate Botanist Signed: Kyler Rowson Date: 18/11/2021

Please return completed form to **Species And Communities Branch DBCA**,  
 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au

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 Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database



# Threatened and Priority Flora Report Form

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<b>TAXON:</b> <u>Grevillea sp. Cooljarloo (B.J. Keighery 28 B)</u>		<b>TPFL Pop. No.:</b> _____	
<b>OBSERVATION DATE:</b> <u>29/10/2021</u>		<b>CONSERVATION STATUS:</b> <u>P1</u> New population <input type="checkbox"/>	
<b>OBSERVER/S:</b> <u>David Coultas, Taylah Hanks</u>		<b>PHONE:</b> <u>9315 4688</u>	
<b>ROLE:</b> <u>Prinicipal Botanist and Graduate Botanist</u>		<b>ORGANISATION:</b> <u>Umwelt Australia</u>	

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):  
West of Tronox's Cooljarloo mine site, approximately 7km south of Wongonderrah Road and 11.4km southwest of the intersection between Wongonderrah Road and Brand Highway

<b>DBC DISTRICT:</b> <u>Moora</u>		<b>LGA:</b> <u>Dandaragan</u>		<b>Reserve No.:</b> _____	
<b>DATUM:</b>		<b>COORDINATES:</b> (If UTM coords provided, Zone is also required)		<b>METHOD USED:</b>	
GDA94 / MGA94 <input checked="" type="checkbox"/>		DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM's <input checked="" type="checkbox"/>		GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>	
AGD84 / AMG84 <input type="checkbox"/>		<b>Lat / Northing:</b> <u>6611408.78</u>		No. satellites: _____    Map used: _____	
WGS84 <input type="checkbox"/>		<b>Long / Easting:</b> <u>343478.674</u>		Boundary polygon captured: <input type="checkbox"/> Map scale: _____	
Unknown <input type="checkbox"/>		<b>ZONE:</b> <u>50</u>			
<b>LAND TENURE:</b>					
Nature reserve <input type="checkbox"/>		Timber reserve <input type="checkbox"/>		Private property <input type="checkbox"/>	
National park <input type="checkbox"/>		State forest <input type="checkbox"/>		Pastoral lease <input type="checkbox"/>	
Conservation park <input type="checkbox"/>		Water reserve <input type="checkbox"/>		UCL <input checked="" type="checkbox"/>	
				Rail reserve <input type="checkbox"/>	
				MRWA road reserve <input type="checkbox"/>	
				SLK/Pole _____ to _____	
				Shire road reserve <input type="checkbox"/>	
				Other Crown reserve <input type="checkbox"/>	
				Specify other: _____	

<b>AREA ASSESSMENT:</b> Edge survey <input type="checkbox"/> Partial survey <input checked="" type="checkbox"/> Full survey <input type="checkbox"/>		Area observed (m <sup>2</sup> ): _____	
<b>EFFORT:</b> Time spent surveying (minutes): _____		No. of minutes spent / 100 m <sup>2</sup> : _____	
<b>POP'N COUNT ACCURACY:</b> Actual <input checked="" type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>		Count method: _____ (Refer to field manual for list)	
<b>WHAT COUNTED:</b> Plants <input checked="" type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>			
<b>TOTAL POP'N STRUCTURE:</b>			
	<b>Mature:</b>	<b>Juveniles:</b>	<b>Seedlings:</b>
Alive	9		9
Dead			
		Area of pop (m <sup>2</sup> ): _____	
		Note: Pls record count as numbers (not percentages) for database.	
<b>QUADRATS PRESENT:</b> No. _____    Size _____		Data attached <input type="checkbox"/> Total area of quadrats (m <sup>2</sup> ): _____	
<b>Summary Quad. Totals: Alive</b>			
<b>REPRODUCTIVE STATE:</b> Clonal <input type="checkbox"/> Vegetative <input type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input type="checkbox"/>			
Immature fruit <input type="checkbox"/> Fruit <input type="checkbox"/> Dehisced fruit <input type="checkbox"/>		Percentage in flower: _____%	

**CONDITION OF PLANTS:** Healthy     Moderate     Poor     Senescent

**COMMENT:** \_\_\_\_\_

THREATS - type, agent and supporting information:	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)			
• Clearing for drill line	N	M	S
• Mining	N	H	L
•	_____	_____	_____

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 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: [flora.data@dbca.wa.gov.au](mailto:flora.data@dbca.wa.gov.au)

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: \_\_\_\_\_    Sheet No.: \_\_\_\_\_    Record Entered in Database



# Threatened and Priority Flora Report Form

**HABITAT INFORMATION:**

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Inundated

**VEGETATION CLASSIFICATION\*:**

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);  
 2. Open shrubland (Hibbertia sp., Acacia spp.);  
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (non-dominant) spp \_\_\_\_\_

\* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

**CONDITION OF HABITAT:** Pristine  Excellent  Very good  Good  Degraded  Completely degraded

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  No signs of fire

**FENCING:** Not required  Present  Replace / repair  Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Replace / reposition  Required  Quantity req'd: \_\_\_\_\_

**OTHER COMMENTS:** (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) \_\_\_\_\_

Shapefile of all locations recorded attached

Specimen not vouchered

**DRF PERMIT/ LICENCE No:** Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Kyler Rowson Role: Graduate Botanist Signed: Kyler Rowson Date: 18/11/2021

Please return completed form to **Species And Communities Branch DBCA**,  
 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.  
 Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database



# Threatened and Priority Flora Report Form

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au> under Standard Report Forms

<b>TAXON:</b> <u>Hensmania stoniella</u>		<b>TPFL Pop. No.:</b> _____	
<b>OBSERVATION DATE:</b> <u>28/10/2021</u>		<b>CONSERVATION STATUS:</b> <u>P3</u> New population <input type="checkbox"/>	
<b>OBSERVER/S:</b> <u>David Coultas, Taylah Hanks</u>		<b>PHONE:</b> <u>9315 4688</u>	
<b>ROLE:</b> <u>Prinicipal Botanist and Graduate Botanist</u>		<b>ORGANISATION:</b> <u>Umwelt Australia</u>	

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):  
Southeast of Jurien, approximately 800m south of Cairn Road, and approximately 2km southwest of the intersection between Cairn Road and Munbinea Road.

<b>DBC DISTRICT:</b> <u>Moora</u>		<b>LGA:</b> <u>Dandaragan</u>		<b>Reserve No.:</b> _____	
<b>DATUM:</b>		<b>COORDINATES:</b> (If UTM coords provided, Zone is also required)		<b>METHOD USED:</b>	
GDA94 / MGA94 <input checked="" type="checkbox"/>		DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM's <input checked="" type="checkbox"/>		GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>	
AGD84 / AMG84 <input type="checkbox"/>		<b>Lat / Northing:</b> <u>6640204.95</u>		No. satellites: _____    Map used: _____	
WGS84 <input type="checkbox"/>		<b>Long / Easting:</b> <u>326718.144</u>		Boundary polygon captured: <input type="checkbox"/> Map scale: _____	
Unknown <input type="checkbox"/>		<b>ZONE:</b> <u>50</u>			
<b>LAND TENURE:</b>					
Nature reserve <input type="checkbox"/>		Timber reserve <input type="checkbox"/>		Private property <input checked="" type="checkbox"/>	
National park <input type="checkbox"/>		State forest <input type="checkbox"/>		Pastoral lease <input type="checkbox"/>	
Conservation park <input type="checkbox"/>		Water reserve <input type="checkbox"/>		UCL <input type="checkbox"/>	
				Rail reserve <input type="checkbox"/>	
				MRWA road reserve <input type="checkbox"/>	
				SLK/Pole _____ to _____	
				Shire road reserve <input type="checkbox"/>	
				Other Crown reserve <input type="checkbox"/>	
				Specify other: _____	

<b>AREA ASSESSMENT:</b> Edge survey <input type="checkbox"/> Partial survey <input checked="" type="checkbox"/> Full survey <input type="checkbox"/>		Area observed (m <sup>2</sup> ): _____	
<b>EFFORT:</b> Time spent surveying (minutes): _____		No. of minutes spent / 100 m <sup>2</sup> : _____	
<b>POP'N COUNT ACCURACY:</b> Actual <input checked="" type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>		Count method: _____ (Refer to field manual for list)	
<b>WHAT COUNTED:</b>		Plants <input checked="" type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>	
<b>TOTAL POP'N STRUCTURE:</b>			
	<b>Mature:</b>	<b>Juveniles:</b>	<b>Seedlings:</b>
Alive	1		1
Dead			
		Area of pop (m <sup>2</sup> ): _____	
		Note: Pls record count as numbers (not percentages) for database.	
<b>QUADRATS PRESENT:</b>		No. _____    Size _____    Data attached <input type="checkbox"/> Total area of quadrats (m <sup>2</sup> ): _____	
<b>Summary Quad. Totals: Alive</b>			
<b>REPRODUCTIVE STATE:</b>		Clonal <input type="checkbox"/> Vegetative <input type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input type="checkbox"/>	
Immature fruit <input type="checkbox"/> Fruit <input type="checkbox"/> Dehisced fruit <input type="checkbox"/>		Percentage in flower: _____%	

**CONDITION OF PLANTS:**    Healthy     Moderate     Poor     Senescent

**COMMENT:** \_\_\_\_\_

THREATS - type, agent and supporting information:	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)			
• Clearing for drill line	N	M	S
• Mining	N	H	L
•	_____	_____	_____



# Threatened and Priority Flora Report Form

**HABITAT INFORMATION:**

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Inundated

**VEGETATION CLASSIFICATION\*:**

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);  
 2. Open shrubland (Hibbertia sp., Acacia spp.);  
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (non-dominant) spp \_\_\_\_\_

\* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

**CONDITION OF HABITAT:** Pristine  Excellent  Very good  Good  Degraded  Completely degraded

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  No signs of fire

**FENCING:** Not required  Present  Replace / repair  Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Replace / reposition  Required  Quantity req'd: \_\_\_\_\_

**OTHER COMMENTS:** (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) \_\_\_\_\_

Shapefile of all locations recorded attached

\_\_\_\_\_

\_\_\_\_\_

Specimen not vouchered

\_\_\_\_\_

**DRF PERMIT/ LICENCE No:** Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Kyler Rowson Role: Graduate Botanist Signed: Kyler Rowson Date: 18/11/2021



# Threatened and Priority Flora Report Form

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au> under Standard Report Forms

<b>TAXON:</b>	Isopogon panduratus subsp. palustris	<b>TPFL Pop. No.:</b>	
<b>OBSERVATION DATE:</b>	27/10/2021	<b>CONSERVATION STATUS:</b>	P3 <input type="checkbox"/> New population <input type="checkbox"/>
<b>OBSERVER/S:</b>	David Coultas, Taylah Hanks	<b>PHONE</b>	9315 4688
<b>ROLE:</b>	Principal Botanist and Graduate Botanist	<b>ORGANISATION:</b>	Umwelt Australia

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):  
West of Tronox's Cooljarloo mine site, approximately 4.5km north of Woolka Road and 7.8km west of Brand Highway

<b>DBC DISTRICT:</b> Moora		<b>LGA:</b> Dandaragan		<b>Reserve No.:</b>	
<b>DATUM:</b>		<b>COORDINATES:</b> (If UTM coords provided, Zone is also required)		<b>METHOD USED:</b>	
GDA94 / MGA94 <input checked="" type="checkbox"/>	DecDegrees <input type="checkbox"/>	DegMinSec <input type="checkbox"/>	UTMs <input checked="" type="checkbox"/>	GPS <input checked="" type="checkbox"/>	Differential GPS <input type="checkbox"/>
AGD84 / AMG84 <input type="checkbox"/>	<b>Lat / Northing:</b> 6609832.02		No. satellites: _____		Map used: _____
WGS84 <input type="checkbox"/>	<b>Long / Easting:</b> 344916.482		Boundary polygon captured: <input type="checkbox"/>		Map scale: _____
Unknown <input type="checkbox"/>	<b>ZONE:</b> 50				
<b>LAND TENURE:</b>					
Nature reserve <input type="checkbox"/>	Timber reserve <input type="checkbox"/>	Private property <input type="checkbox"/>	Rail reserve <input type="checkbox"/>	Shire road reserve <input type="checkbox"/>	
National park <input type="checkbox"/>	State forest <input type="checkbox"/>	Pastoral lease <input type="checkbox"/>	MRWA road reserve <input type="checkbox"/>	Other Crown reserve <input type="checkbox"/>	
Conservation park <input type="checkbox"/>	Water reserve <input type="checkbox"/>	UCL <input checked="" type="checkbox"/>	SLK/Pole _____ to _____	Specify other: _____	

<b>AREA ASSESSMENT:</b> Edge survey <input type="checkbox"/> Partial survey <input checked="" type="checkbox"/> Full survey <input type="checkbox"/>		Area observed (m <sup>2</sup> ): _____	
<b>EFFORT:</b> Time spent surveying (minutes): _____		No. of minutes spent / 100 m <sup>2</sup> : _____	
<b>POP'N COUNT ACCURACY:</b> Actual <input checked="" type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>		Count method: _____ <small>(Refer to field manual for list)</small>	
<b>WHAT COUNTED:</b>	Plants <input checked="" type="checkbox"/>	Clumps <input type="checkbox"/>	Clonal stems <input type="checkbox"/>
<b>TOTAL POP'N STRUCTURE:</b>	<b>Mature:</b>	<b>Juveniles:</b>	<b>Seedlings:</b>
Alive	15		15
Dead			
Area of pop (m <sup>2</sup> ): _____			
<small>Note: Pls record count as numbers (not percentages) for database.</small>			
<b>QUADRATS PRESENT:</b>	No. _____	Size _____	Data attached <input type="checkbox"/>
Total area of quadrats (m <sup>2</sup> ): _____			
<b>Summary Quad. Totals:</b> Alive			
<b>REPRODUCTIVE STATE:</b>			
Clonal <input type="checkbox"/>	Vegetative <input type="checkbox"/>	Flowerbud <input type="checkbox"/>	Flower <input type="checkbox"/>
Immature fruit <input type="checkbox"/>	Fruit <input type="checkbox"/>	Dehisced fruit <input type="checkbox"/>	Percentage in flower: _____%

**CONDITION OF PLANTS:** Healthy  Moderate  Poor  Senescent

**COMMENT:** \_\_\_\_\_

THREATS - type, agent and supporting information:	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)			
• Clearing for drill line	N	M	S
• Mining	N	H	L
•	_____	_____	_____

Please return completed form to **Species And Communities Branch DBCA**,  
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: [flora.data@dbca.wa.gov.au](mailto:flora.data@dbca.wa.gov.au)

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.  
Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database



# Threatened and Priority Flora Report Form

**HABITAT INFORMATION:**

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Inundated

**VEGETATION CLASSIFICATION\*:**

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);  
 2. Open shrubland (Hibbertia sp., Acacia spp.);  
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (non-dominant) spp \_\_\_\_\_

\* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

**CONDITION OF HABITAT:** Pristine  Excellent  Very good  Good  Degraded  Completely degraded

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  No signs of fire

**FENCING:** Not required  Present  Replace / repair  Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Replace / reposition  Required  Quantity req'd: \_\_\_\_\_

**OTHER COMMENTS:** (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) \_\_\_\_\_

Shapefile of all locations recorded attached

Specimen not vouchered

**DRF PERMIT/ LICENCE No:** Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Kyler Rowson Role: Graduate Botanist Signed: Kyler Rowson Date: 18/11/2021

Please return completed form to **Species And Communities Branch DBCA**,  
 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.  
 Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database





# Threatened and Priority Flora Report Form

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<b>TAXON:</b> <u>Poranthera asybosca</u>		<b>TPFL Pop. No.:</b> _____	
<b>OBSERVATION DATE:</b> <u>28/10/2021</u>		<b>CONSERVATION STATUS:</b> <u>P1</u> <span style="float:right">New population <input checked="" type="checkbox"/></span>	
<b>OBSERVER/S:</b> <u>David Coultas, Taylah Hanks</u>		<b>PHONE:</b> <u>9315 4688</u>	
<b>ROLE:</b> <u>Princippal Botanist and Graduate Botanist</u>		<b>ORGANISATION:</b> <u>Umwelt Australia</u>	

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):  
North of Tronox's Cooljarloo mine site, approximately 1.5km south of Wongonderrah Road and 9km west of Brand Highway

<b>DBC DISTRICT:</b> <u>Moora</u>		<b>LGA:</b> <u>Dandaragan</u>		<b>Reserve No.:</b> _____	
<b>DATUM:</b>		<b>COORDINATES:</b> (If UTM coords provided, Zone is also required)		<b>METHOD USED:</b>	
GDA94 / MGA94 <input checked="" type="checkbox"/>		DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM's <input checked="" type="checkbox"/>		GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>	
AGD84 / AMG84 <input type="checkbox"/>		<b>Lat / Northing:</b> <u>6616944</u>		No. satellites: _____ Map used: _____	
WGS84 <input type="checkbox"/>		<b>Long / Easting:</b> <u>343469.9</u>		Boundary polygon captured: <input type="checkbox"/> Map scale: _____	
Unknown <input type="checkbox"/>		<b>ZONE:</b> <u>50</u>			
<b>LAND TENURE:</b>					
Nature reserve <input type="checkbox"/>		Timber reserve <input type="checkbox"/>		Private property <input type="checkbox"/>	
National park <input type="checkbox"/>		State forest <input type="checkbox"/>		Rail reserve <input type="checkbox"/>	
Conservation park <input type="checkbox"/>		Water reserve <input type="checkbox"/>		Pastoral lease <input type="checkbox"/>	
		UCL <input checked="" type="checkbox"/>		MRWA road reserve <input type="checkbox"/>	
		SLK/Pole _____ to _____		Shire road reserve <input type="checkbox"/>	
				Other Crown reserve <input type="checkbox"/>	
				Specify other: _____	

<b>AREA ASSESSMENT:</b> Edge survey <input type="checkbox"/> Partial survey <input checked="" type="checkbox"/> Full survey <input type="checkbox"/>		Area observed (m <sup>2</sup> ): _____	
<b>EFFORT:</b> Time spent surveying (minutes): _____		No. of minutes spent / 100 m <sup>2</sup> : _____	
<b>POP'N COUNT ACCURACY:</b> Actual <input checked="" type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>		Count method: _____ (Refer to field manual for list)	
<b>WHAT COUNTED:</b> Plants <input checked="" type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>			
<b>TOTAL POP'N STRUCTURE:</b>			
	<b>Mature:</b>	<b>Juveniles:</b>	<b>Seedlings:</b>
Alive	30		30
Dead			
		Area of pop (m <sup>2</sup> ): _____	
		Note: Pls record count as numbers (not percentages) for database.	
<b>QUADRATS PRESENT:</b> No. _____ Size _____		Data attached <input type="checkbox"/> Total area of quadrats (m <sup>2</sup> ): _____	
<b>Summary Quad. Totals: Alive</b>			
<b>REPRODUCTIVE STATE:</b>			
Clonal <input type="checkbox"/> Vegetative <input type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input checked="" type="checkbox"/>			
Immature fruit <input type="checkbox"/> Fruit <input checked="" type="checkbox"/> Dehisced fruit <input type="checkbox"/>		Percentage in flower: _____ %	

**CONDITION OF PLANTS:** Healthy  Moderate  Poor  Senescent

**COMMENT:** \_\_\_\_\_

THREATS - type, agent and supporting information:	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)			
• Clearing for drill line	N	M	S
• Mining	N	H	L
•	_____	_____	_____

Please return completed form to **Species And Communities Branch DBCA**,  
 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: [flora.data@dbca.wa.gov.au](mailto:flora.data@dbca.wa.gov.au)

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database



# Threatened and Priority Flora Report Form

## HABITAT INFORMATION:

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Inundated

**VEGETATION CLASSIFICATION\*:**

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);  
 2. Open shrubland (Hibbertia sp., Acacia spp.);  
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (non-dominant) spp \_\_\_\_\_

\* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

**CONDITION OF HABITAT:** Pristine  Excellent  Very good  Good  Degraded  Completely degraded

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  No signs of fire

**FENCING:** Not required  Present  Replace / repair  Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Replace / reposition  Required  Quantity req'd: \_\_\_\_\_

**OTHER COMMENTS:** (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) \_\_\_\_\_

Shapefile of all locations recorded attached

Specimen vouchered: collectors No. DCTH-03

**DRF PERMIT/ LICENCE No:** Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Kyler Rowson Role: Graduate Botanist Signed: Kyler Rowson Date: 18/11/2021



# Threatened and Priority Flora Report Form

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au> under Standard Report Forms

<b>TAXON:</b> <u>Schoenus griffinianus</u>		<b>TPFL Pop. No.:</b> _____	
<b>OBSERVATION DATE:</b> <u>28/10/2021</u>		<b>CONSERVATION STATUS:</b> <u>P4</u> New population <input type="checkbox"/>	
<b>OBSERVER/S:</b> <u>David Coultas, Taylah Hanks</u>		<b>PHONE:</b> <u>9315 4688</u>	
<b>ROLE:</b> <u>Prinicipal Botanist and Graduate Botanist</u>		<b>ORGANISATION:</b> <u>Umwelt Australia</u>	

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):  
Southeast of Jurien, approximately 800m south of Cairn Road, and approximately 2km southwest of the intersection between Cairn Road and Munbinea Road.

<b>DBC DISTRICT:</b> <u>Moora</u>		<b>LGA:</b> <u>Dandaragan</u>		<b>Reserve No.:</b> _____	
<b>DATUM:</b>		<b>COORDINATES:</b> (If UTM coords provided, Zone is also required)		<b>METHOD USED:</b>	
GDA94 / MGA94 <input checked="" type="checkbox"/>		DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM's <input checked="" type="checkbox"/>		GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>	
AGD84 / AMG84 <input type="checkbox"/>		<b>Lat / Northing:</b> <u>6640211.08</u>		No. satellites: _____    Map used: _____	
WGS84 <input type="checkbox"/>		<b>Long / Easting:</b> <u>326692.471</u>		Boundary polygon captured: <input type="checkbox"/> Map scale: _____	
Unknown <input type="checkbox"/>		<b>ZONE:</b> <u>50</u>			
<b>LAND TENURE:</b>					
Nature reserve <input type="checkbox"/>		Timber reserve <input type="checkbox"/>		Private property <input checked="" type="checkbox"/>	
National park <input type="checkbox"/>		State forest <input type="checkbox"/>		Pastoral lease <input type="checkbox"/>	
Conservation park <input type="checkbox"/>		Water reserve <input type="checkbox"/>		UCL <input type="checkbox"/>	
				Rail reserve <input type="checkbox"/>	
				MRWA road reserve <input type="checkbox"/>	
				SLK/Pole _____ to _____	
				Shire road reserve <input type="checkbox"/>	
				Other Crown reserve <input type="checkbox"/>	
				Specify other: _____	

<b>AREA ASSESSMENT:</b> Edge survey <input type="checkbox"/> Partial survey <input checked="" type="checkbox"/> Full survey <input type="checkbox"/>		Area observed (m <sup>2</sup> ): _____	
<b>EFFORT:</b> Time spent surveying (minutes): _____		No. of minutes spent / 100 m <sup>2</sup> : _____	
<b>POP'N COUNT ACCURACY:</b> Actual <input checked="" type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>		Count method: _____ (Refer to field manual for list)	
<b>WHAT COUNTED:</b> Plants <input checked="" type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>			
<b>TOTAL POP'N STRUCTURE:</b>			
	<b>Mature:</b>	<b>Juveniles:</b>	<b>Seedlings:</b>
Alive	1		1
Dead			
		Area of pop (m <sup>2</sup> ): _____	
		Note: Pls record count as numbers (not percentages) for database.	
<b>QUADRATS PRESENT:</b> No. _____    Size _____    Data attached <input type="checkbox"/>		Total area of quadrats (m <sup>2</sup> ): _____	
<b>Summary Quad. Totals: Alive</b>			
<b>REPRODUCTIVE STATE:</b> Clonal <input type="checkbox"/> Vegetative <input type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input type="checkbox"/>			
Immature fruit <input type="checkbox"/> Fruit <input type="checkbox"/> Dehisced fruit <input type="checkbox"/>		Percentage in flower: _____%	

**CONDITION OF PLANTS:** Healthy     Moderate     Poor     Senescent

**COMMENT:** \_\_\_\_\_

THREATS - type, agent and supporting information:	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)			
• Clearing for drill line	N	M	S
• Mining	N	H	L
•	---	---	---

Please return completed form to **Species And Communities Branch DBCA**,  
 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: [flora.data@dbca.wa.gov.au](mailto:flora.data@dbca.wa.gov.au)

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.

Record entered by: \_\_\_\_\_    Sheet No.: \_\_\_\_\_    Record Entered in Database



# Threatened and Priority Flora Report Form

**HABITAT INFORMATION:**

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

Specific Landform Element: \_\_\_\_\_  
(Refer to field manual for additional values)

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Inundated

**VEGETATION CLASSIFICATION\*:**

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);  
2. Open shrubland (Hibbertia sp., Acacia spp.);  
3. Isolated clumps of sedges (Mesomelaena tetragona)

1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_  
4. \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (non-dominant) spp \_\_\_\_\_

\* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

**CONDITION OF HABITAT:** Pristine  Excellent  Very good  Good  Degraded  Completely degraded

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  No signs of fire

**FENCING:** Not required  Present  Replace / repair  Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Replace / reposition  Required  Quantity req'd: \_\_\_\_\_

**OTHER COMMENTS:** (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) \_\_\_\_\_

Shapefile of all locations recorded attached

Specimen not vouchered

**DRF PERMIT/ LICENCE No:** Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Kyler Rowson Role: Graduate Botanist Signed: Kyler Rowson Date: 18/11/2021

Please return completed form to **Species And Communities Branch DBCA**,  
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.  
Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database



# Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au> under Standard Report Forms

<b>TAXON:</b> <u>Schoenus pennisetis</u>		<b>TPFL Pop. No.:</b> _____	
<b>OBSERVATION DATE:</b> <u>29/10/2021</u>		<b>CONSERVATION STATUS:</b> <u>P3</u> <input type="checkbox"/> New population <input type="checkbox"/>	
<b>OBSERVER/S:</b> <u>David Coultas, Taylah Hanks</u>		<b>PHONE:</b> <u>9315 4688</u>	
<b>ROLE:</b> <u>Principal Botanist and Graduate Botanist</u>		<b>ORGANISATION:</b> <u>Umwelt Australia</u>	

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):  
West of Tronox's Cooljarloo mine site, approximately 6.8km north of Woolka Road and 10km west of Brand Highway

<b>DBC DISTRICT:</b> <u>Moora</u>		<b>LGA:</b> <u>Dandaragan</u>		<b>Reserve No.:</b> _____	
<b>DATUM:</b>		<b>COORDINATES:</b> (If UTM coords provided, Zone is also required)		<b>METHOD USED:</b>	
GDA94 / MGA94 <input checked="" type="checkbox"/>		DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM <input checked="" type="checkbox"/>		GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>	
AGD84 / AMG84 <input type="checkbox"/>		<b>Lat / Northing:</b> <u>6611734.22</u>		No. satellites: _____ Map used: _____	
WGS84 <input type="checkbox"/>		<b>Long / Easting:</b> <u>343063.37</u>		Boundary polygon captured: <input type="checkbox"/> Map scale: _____	
Unknown <input type="checkbox"/>		<b>ZONE:</b> <u>50</u>			
<b>LAND TENURE:</b>					
Nature reserve <input type="checkbox"/>		Timber reserve <input type="checkbox"/>		Private property <input type="checkbox"/>	
National park <input type="checkbox"/>		State forest <input type="checkbox"/>		Rail reserve <input type="checkbox"/>	
Conservation park <input type="checkbox"/>		Water reserve <input type="checkbox"/>		Pastoral lease <input type="checkbox"/>	
		UCL <input checked="" type="checkbox"/>		MRWA road reserve <input type="checkbox"/>	
		SLK/Pole _____ to _____		Shire road reserve <input type="checkbox"/>	
				Other Crown reserve <input type="checkbox"/>	
				Specify other: _____	

**AREA ASSESSMENT:** Edge survey  Partial survey  Full survey  Area observed (m<sup>2</sup>): \_\_\_\_\_

**EFFORT:** Time spent surveying (minutes): \_\_\_\_\_ No. of minutes spent / 100 m<sup>2</sup>: \_\_\_\_\_

**POP'N COUNT ACCURACY:** Actual  Extrapolation  Estimate  Count method: \_\_\_\_\_  
(Refer to field manual for list)

**WHAT COUNTED:** Plants  Clumps  Clonal stems

<b>TOTAL POP'N STRUCTURE:</b>	<b>Mature:</b>	<b>Juveniles:</b>	<b>Seedlings:</b>	<b>Totals:</b>	Area of pop (m <sup>2</sup> ): _____ Note: Pls record count as numbers (not percentages) for database.
Alive	1			1	
Dead					

**QUADRATS PRESENT:** No. \_\_\_\_\_ Size \_\_\_\_\_ Data attached  Total area of quadrats (m<sup>2</sup>): \_\_\_\_\_

**Summary Quad. Totals:** Alive \_\_\_\_\_

**REPRODUCTIVE STATE:** Clonal  Vegetative  Flowerbud  Flower   
Immature fruit  Fruit  Dehisced fruit  Percentage in flower: \_\_\_\_\_%

**CONDITION OF PLANTS:** Healthy  Moderate  Poor  Senescent

**COMMENT:** \_\_\_\_\_

THREATS - type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
• Clearing for drill line	N	M	S
• Mining	N	H	L
•	_____	_____	_____

Please return completed form to **Species And Communities Branch DBCA**,  
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: [flora.data@dbca.wa.gov.au](mailto:flora.data@dbca.wa.gov.au)

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.  
Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database



# Threatened and Priority Flora Report Form

**HABITAT INFORMATION:**

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Inundated

**VEGETATION CLASSIFICATION\*:**

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);  
 2. Open shrubland (Hibbertia sp., Acacia spp.);  
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (non-dominant) spp \_\_\_\_\_

\* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

**CONDITION OF HABITAT:** Pristine  Excellent  Very good  Good  Degraded  Completely degraded

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  No signs of fire

**FENCING:** Not required  Present  Replace / repair  Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Replace / reposition  Required  Quantity req'd: \_\_\_\_\_

**OTHER COMMENTS:** (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) \_\_\_\_\_

Shapefile of all locations recorded attached

Specimen not vouchered, on existing drill line.

**DRF PERMIT/ LICENCE No:** Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Kyler Rowson Role: Graduate Botanist Signed: Kyler Rowson Date: 18/11/2021

Please return completed form to **Species And Communities Branch DBCA**,  
 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.  
 Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database



# Threatened and Priority Flora Report Form

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au> under Standard Report Forms

<b>TAXON:</b> <u>Stylidium hymanocraspedum</u>		<b>TPFL Pop. No.:</b> _____	
<b>OBSERVATION DATE:</b> <u>28/10/2021</u>		<b>CONSERVATION STATUS:</b> <u>P3</u> New population <input type="checkbox"/>	
<b>OBSERVER/S:</b> <u>David Coultas, Taylah Hanks</u>		<b>PHONE:</b> <u>9315 4688</u>	
<b>ROLE:</b> <u>Prinicipal Botanist and Graduate Botanist</u>		<b>ORGANISATION:</b> <u>Umwelt Australia</u>	

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):  
West of Tronox's Cooljarloo mine site, approximately 770m south of Wongonderrah Road and 8.4km westsouthwest of the intersection between Wongonderrah Road and Brand Highway

<b>DBC DISTRICT:</b> <u>Moora</u>		<b>LGA:</b> <u>Dandaragan</u>		<b>Reserve No.:</b> _____	
<b>DATUM:</b>		<b>COORDINATES:</b> (If UTM coords provided, Zone is also required)		<b>METHOD USED:</b>	
GDA94 / MGA94 <input checked="" type="checkbox"/>		DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM's <input checked="" type="checkbox"/>		GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/>	
AGD84 / AMG84 <input type="checkbox"/>		<b>Lat / Northing:</b> <u>6617636.83</u>		No. satellites: _____    Map used: _____	
WGS84 <input type="checkbox"/>		<b>Long / Easting:</b> <u>344197.83</u>		Boundary polygon captured: <input type="checkbox"/> Map scale: _____	
Unknown <input type="checkbox"/>		<b>ZONE:</b> <u>50</u>			
<b>LAND TENURE:</b>					
Nature reserve <input type="checkbox"/>		Timber reserve <input type="checkbox"/>		Private property <input type="checkbox"/>	
National park <input type="checkbox"/>		State forest <input type="checkbox"/>		Pastoral lease <input type="checkbox"/>	
Conservation park <input type="checkbox"/>		Water reserve <input type="checkbox"/>		UCL <input checked="" type="checkbox"/>	
				Rail reserve <input type="checkbox"/>	
				MRWA road reserve <input type="checkbox"/>	
				SLK/Pole _____ to _____	
				Shire road reserve <input type="checkbox"/>	
				Other Crown reserve <input type="checkbox"/>	
				Specify other: _____	

<b>AREA ASSESSMENT:</b> Edge survey <input type="checkbox"/> Partial survey <input checked="" type="checkbox"/> Full survey <input type="checkbox"/>		Area observed (m <sup>2</sup> ): _____	
<b>EFFORT:</b> Time spent surveying (minutes): _____		No. of minutes spent / 100 m <sup>2</sup> : _____	
<b>POP'N COUNT ACCURACY:</b> Actual <input checked="" type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>		Count method: _____ (Refer to field manual for list)	
<b>WHAT COUNTED:</b>		Plants <input checked="" type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>	
<b>TOTAL POP'N STRUCTURE:</b>			
	<b>Mature:</b>	<b>Juveniles:</b>	<b>Seedlings:</b>
Alive	11		11
Dead			
		Area of pop (m <sup>2</sup> ): _____	
		Note: Pls record count as numbers (not percentages) for database.	
<b>QUADRATS PRESENT:</b>		No. _____    Size _____    Data attached <input type="checkbox"/> Total area of quadrats (m <sup>2</sup> ): _____	
<b>Summary Quad. Totals: Alive</b>			
<b>REPRODUCTIVE STATE:</b>		Clonal <input type="checkbox"/> Vegetative <input type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input type="checkbox"/>	
Immature fruit <input type="checkbox"/> Fruit <input type="checkbox"/> Dehisced fruit <input type="checkbox"/>		Percentage in flower: _____%	

**CONDITION OF PLANTS:**    Healthy     Moderate     Poor     Senescent

**COMMENT:** \_\_\_\_\_

THREATS - type, agent and supporting information:	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)			
• Clearing for drill line	N	M	S
• Mining	N	H	L
•	_____	_____	_____



# Threatened and Priority Flora Report Form

**HABITAT INFORMATION:**

<b>LANDFORM:</b>	<b>ROCK TYPE:</b>	<b>LOOSE ROCK:</b>	<b>SOIL TYPE:</b>	<b>SOIL COLOUR:</b>	<b>DRAINAGE:</b>
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

**CONDITION OF SOIL:** Dry  Moist  Waterlogged  Inundated

**VEGETATION CLASSIFICATION\*:**

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);  
 2. Open shrubland (Hibbertia sp., Acacia spp.);  
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_

**ASSOCIATED SPECIES:**

Other (non-dominant) spp \_\_\_\_\_

\* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

**CONDITION OF HABITAT:** Pristine  Excellent  Very good  Good  Degraded  Completely degraded

**COMMENT:** \_\_\_\_\_

**FIRE HISTORY:** Last Fire: Season/Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fire Intensity: High  Medium  Low  No signs of fire

**FENCING:** Not required  Present  Replace / repair  Required  Length req'd: \_\_\_\_\_

**ROADSIDE MARKERS:** Not required  Present  Replace / reposition  Required  Quantity req'd: \_\_\_\_\_

**OTHER COMMENTS:** (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) \_\_\_\_\_

Shapefile of all locations recorded attached

\_\_\_\_\_

\_\_\_\_\_

Specimen not vouchered

\_\_\_\_\_

**DRF PERMIT/ LICENCE No:** Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

**SPECIMEN:** Collectors No: \_\_\_\_\_ WA Herb.  Regional Herb.  District Herb.  Other: \_\_\_\_\_

**ATTACHED:** Map  Mudmap  Photo  GIS data  Field notes  Other: \_\_\_\_\_

**COPY SENT TO:** Regional Office  District Office  Other: \_\_\_\_\_

Submitter of Record: Kyler Rowson Role: Graduate Botanist Signed: Kyler Rowson Date: 18/11/2021

Please return completed form to **Species And Communities Branch DBCA**,  
 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au

**RECORDS:** Please forward to **Flora Administrative Officer**, Species and Communities Branch.  
 Record entered by: \_\_\_\_\_ Sheet No.: \_\_\_\_\_ Record Entered in Database





# Threatened and Priority Flora Report Form

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au> under Standard Report Forms

<b>TAXON:</b> <u>Verticordia lindleyi subsp. lindleyi</u>	<b>TPFL Pop. No.:</b> _____
<b>OBSERVATION DATE:</b> <u>28/10/2021</u>	<b>CONSERVATION STATUS:</b> <u>P4</u> New population <input type="checkbox"/>
<b>OBSERVER/S:</b> <u>David Coultas, Taylah Hanks</u>	<b>PHONE:</b> <u>9315 4688</u>
<b>ROLE:</b> <u>Principal Botanist and Graduate Botanist</u>	<b>ORGANISATION:</b> <u>Umwelt Australia</u>

**DESCRIPTION OF LOCATION** (Provide at least nearest town/named locality, and the distance and direction to that place):  
West of Tronox's Cooljarloo mine site, approximately 6.8km south of Wongonderrah Road and 11.7 km westsouthwest of the intersection between Wongonderrah Road and Brand Highway

<b>DBC DISTRICT:</b> <u>Moora</u>		<b>LGA:</b> <u>Dandaragan</u>	<b>Reserve No.:</b> _____
<b>DATUM:</b>		<b>COORDINATES:</b> (If UTM coords provided, Zone is also required)	<b>METHOD USED:</b>
GDA94 / MGA94 <input checked="" type="checkbox"/>	DecDegrees <input type="checkbox"/>	DegMinSec <input type="checkbox"/>	UTMs <input checked="" type="checkbox"/>
AGD84 / AMG84 <input type="checkbox"/>	<b>Lat / Northing:</b> <u>6611615.68</u>		GPS <input checked="" type="checkbox"/>
WGS84 <input type="checkbox"/>	<b>Long / Easting:</b> <u>343106.709</u>		Differential GPS <input type="checkbox"/>
Unknown <input type="checkbox"/>	<b>ZONE:</b> <u>50</u>		Map <input type="checkbox"/>
<b>LAND TENURE:</b>			
Nature reserve <input type="checkbox"/>	Timber reserve <input type="checkbox"/>	Private property <input type="checkbox"/>	Rail reserve <input type="checkbox"/>
National park <input type="checkbox"/>	State forest <input type="checkbox"/>	Pastoral lease <input type="checkbox"/>	MRWA road reserve <input type="checkbox"/>
Conservation park <input type="checkbox"/>	Water reserve <input type="checkbox"/>	UCL <input checked="" type="checkbox"/>	SLK/Pole _____ to _____
			Shire road reserve <input type="checkbox"/>
			Other Crown reserve <input type="checkbox"/>
			Specify other: _____

<b>AREA ASSESSMENT:</b> Edge survey <input type="checkbox"/>	Partial survey <input checked="" type="checkbox"/>	Full survey <input type="checkbox"/>	Area observed (m <sup>2</sup> ): _____
<b>EFFORT:</b> Time spent surveying (minutes): _____	No. of minutes spent / 100 m <sup>2</sup> : _____		
<b>POP'N COUNT ACCURACY:</b> Actual <input checked="" type="checkbox"/>	Extrapolation <input type="checkbox"/>	Estimate <input type="checkbox"/>	Count method: _____ (Refer to field manual for list)
<b>WHAT COUNTED:</b>	Plants <input checked="" type="checkbox"/>	Clumps <input type="checkbox"/>	Clonal stems <input type="checkbox"/>
<b>TOTAL POP'N STRUCTURE:</b>	<b>Mature:</b>	<b>Juveniles:</b>	<b>Seedlings:</b>
Alive	<u>6</u>		<u>6</u>
Dead			
<b>QUADRATS PRESENT:</b>	No. _____	Size _____	Data attached <input type="checkbox"/>
<b>Summary Quad. Totals: Alive</b>			Total area of quadrats (m <sup>2</sup> ): _____
<b>REPRODUCTIVE STATE:</b>	Clonal <input type="checkbox"/>	Vegetative <input type="checkbox"/>	Flowerbud <input type="checkbox"/>
	Immature fruit <input type="checkbox"/>	Fruit <input type="checkbox"/>	Dehisced fruit <input type="checkbox"/>
			Flower <input type="checkbox"/>
			Percentage in flower: _____%

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