MOUNT DIMER
APPLICATION OF SELECTED LAND CLEARING PRINCIPLES TO PROPOSED CLEARING
FEBRUARY 2022

FINAL

22 February 2022

PREPARED FOR

AURUMIN LIMITED

PREPARED BY

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RECOMMENDED REFERENCE:

Woodgis (2022) *Mount Dimer Application of Selected Land Clearing Principles to Proposed Clearing February 2022*, unpublished report by Woodgis Environmental Assessment and Management for Aurumin.

ACRONYMS AND ABBREVIATIONS

The following acronyms are used in this report for succinctness:

aff.	affinity (denotes similarity to taxon)
AOI	Area of Interest
BIF	Banded Ironstone Formation
DBCA	(WA) Department of Biodiversity, Conservation and Attractions
EPA	Environment Protection Authority
ha	hectares
km	kilometres
m	metres
Mt	Mount
POW	Programme of Work
ssp.	subspecies
subsp.	subspecies
WA	Western Australia/n

EXECUTIVE SUMMARY

Aurumin Ltd proposes to clear two areas in its Mt Dimer tenements that total 3.5 hectares to facilitate remedial works around the Karli West Waste Rock Dump and realign a track to the Mt Dimer airstrip.

The proposed clearing is not likely to be at variance to Land Clearing Principles A, C or H as this was the conclusion in DMIRS Clearing Permit Decision Report 8291/1 for the clearing of 20.8 hectares of airstrip and associated upgrades that is contiguous with one of the areas of proposed clearing.

The proposed clearing is within a 2,773 hectares Area of Interest that has been subject to comprehensive flora and vegetation surveys. This document should be read in conjugation with the detailed report *Mount Dimer Vegetation and Priority Flora Update February 2022* (Woodgis, 2022) that documented that within a larger encompassing Area of interest:

- A total of 99 quadrats and 24 relevés were established, sampling all landform and geology units at a density of one quadrat/relevé per 22.5 hectare;
- Targeted flora searches were undertaken over two areas totalling 459 hectares with traverses at 20-25 metre spacing; and
- An estimated 100% of the perennial plant taxa and 74% of the annual plant taxa present were recorded.

The clearing envelopes do not intersect:

- any Threatened Ecological Communities or Priority Ecological Communities;
- state-wide system-associations that are restricted or extensively cleared;
- a significant percentage of the 1,186,892 hectares of contiguous conservation estate in which they are located;
- landforms that have an elevated likelihood of supporting restricted vegetation or flora (Banded Ironstone Formations (BIF), granite outcrops, riparian vegetation or permanent surface water);
- any vegetation types that are expected to be restricted;
- any threatened flora taxa; or
- a significant percentage of any of the local populations of the 12 priority flora taxa documented in the vicinity.

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1. INTRODUCTION

1.1. Objectives

This report provides information pertinent to the following three land clearing principles as they may apply to clearing proposed by Aurumin Ltd in its Mt Dimer tenements:

- Principle A: Native vegetation should not be cleared if it comprises a high level of biological diversity;
- Principle C: native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora; and
- Principle H: native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Aurumin Ltd proposes to clear two areas covering approximately 3.5 hectares, with:

- Area A comprising clearing around the perimeter of the Karli West open pit abandonment bund and the Karli West Waste Rock Dump, to provide access, locations to stockpile topsoil, working zones to complete remedial actions to prevent erosion, and allow for the installation of sediment capture structures. Remedial work and sediment capture structures will be constructed from inert mine waste on site and/or from material located within the footprint of the proposed clearing; and
- Area B will have a conventional gravel road constructed on grade, within a 12 metre wide corridor that will include an 8 metre wide running surface for the road and 2 metre wide zones on either side of the road for drainage.

1.2. Background

The 3.5 hectares of clearing is proposed to occur within two envelopes (totalling 13.9 hectares) within the larger 2,773 hectares of flora and vegetation surveys shown in Figure 1.

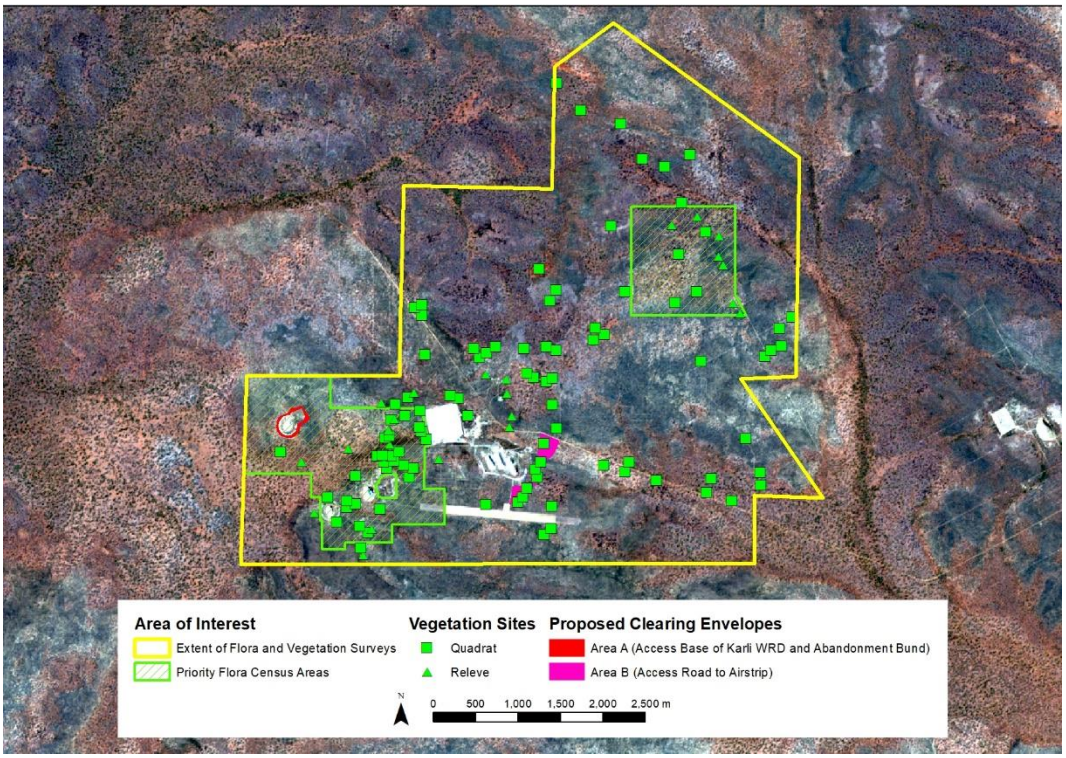

Figure 1: Area of Interest (AOI)

The relevant flora and vegetation data for Figure 1 is documented in *Mount Dimer Vegetation and Priority Flora Update February 2022* (Woodgis, 2022), which incorporated the following:

- *Flora and Vegetation of the Mount Dimer Tenements* (Western Botanical, 2020) documented vegetation mapping of the 665-hectare mining tenement M77/427, and targeted threatened and priority flora surveys of 48 hectares therein, by two botanists 30 May - 10 June 2016 and three botanists 14 - 23 October 2016;
- *Mount Dimer Targeted Flora Survey 2020* (Woodgis, 2021a) documented the targeted priority flora surveys of contiguous areas in tenement M77/427 totalling 72 hectares by two botanists 7-13 December 2020;
- *Mount Dimer Targeted Flora Survey March 2021* (Woodgis, 2021b) documented the targeted priority flora surveys of contiguous areas in tenement M77/427 totalling 181 hectares by two botanists 2-7 March 2021;
- *Woodcutter Tenements Targeted Flora Survey May 2021* (Woodgis, 2021c) documented the targeted priority flora survey across tenements M77/0965, M77/0957, E77/1992 and P77/4568 totalling 158-hectare area in 10-17 May 2021; and
- *Mount Dimer Priority Flora Update July 2021* (Woodgis, 2021d), which consolidated previous data;
- *Mount Dimer Vegetation and Priority Flora Update October 2021* (Woodgis, 2021e) documented the establishment of 54 vegetation quadrats between 05 August and 05 September 2021.; and
- An additional 9 vegetation quadrats established by Woodgis between 15 and 16 November 2021

1.3. Location

Figure 2 shows the location of the Mt Dimer Area of Interest (AOI):

- approximately 55 km north-east of Koolyanobbing, 270 km west-north-west of Kalgoorlie and 190 km north-east of Merredin;
- on Unallocated Crown Land (former Jaurdi station which is proposed to be a 5(1)(H) Reserve managed for the purposes of Conservation and Mining); and
- in the 'Mount Manning Region', an area referred to by the EPA (2007) in providing strategic advice on Mt Manning Nature Reserve and its extensions (also known as the Yilgarn Conservation Reserves).

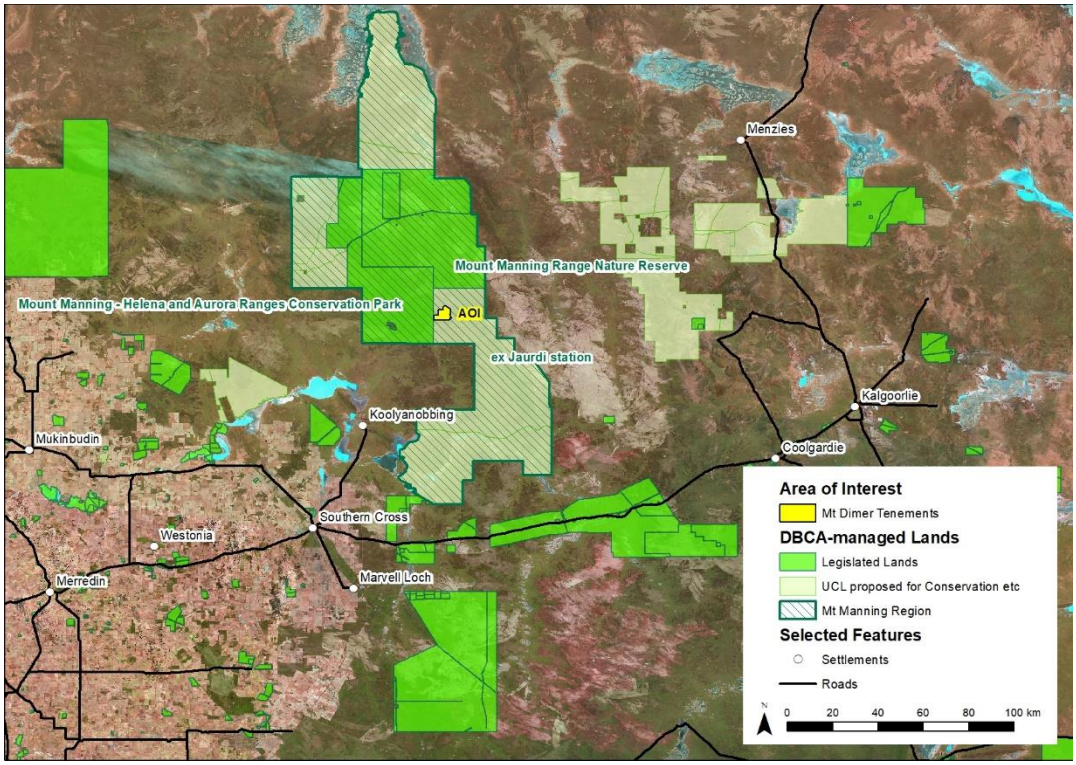

Figure 2: Location of Area of Interest at Mt Dimer

The AOI is located in the Southern Cross subregion of the Coolgardie biogeographic region, as shown in Figure 3.

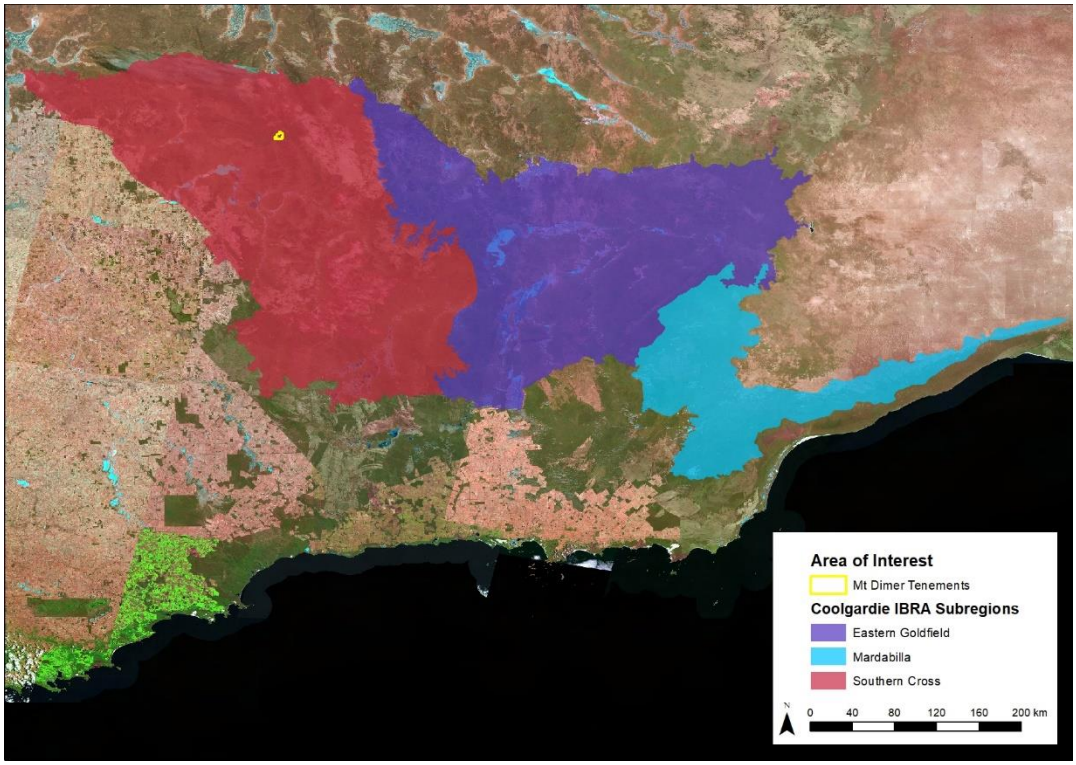

Figure 3: Location of AOI within the Coolgardie Biogeographic Region

The Coolgardie region covers 12,912,204 ha, of which 97.96% remains uncleared (Government of Western Australia, 2017). The Coolgardie region is in an arid to semi-arid climate and was characterised by DPaW (2002) as comprising granite strata of the Yilgarn Craton with Archaean Greenstone intrusions in parallel belts, with occluded drainage.

The Southern Cross subregion covers 6,010,833 ha, of which 96.06% remains uncleared (Government of Western Australia, 2017). The Southern Cross subregion was characterised by DPaW (2002) as having subdued relief of gently undulating uplands dissected by broad valleys with bands of low greenstone hills, and consisting of:

- valleys of duplex and gradational soils that contain chains of saline playa-lakes;
- granite basement outcrops at mid-levels in the landscape;
- upper levels in the landscape are the eroded remnants of a lateritic duricrust yielding yellow sandplains, gravelly sandplains and laterite breakaways;
- scrubs rich in endemic Acacia and Myrtaceae species on uplands, as well as on sand lunettes associated with playas along the broad valley floors, and sand sheets around the granite outcrops; and
- diverse eucalypt woodlands rich in endemic Eucalyptus species around salt lakes, on the low greenstone hills, valley alluvials and broad plains of calcareous earths.

2. EXISTING ENVIRONMENT

2.1. Vegetation

Vegetation System-Associations (Associations in a Vegetation System) are the finest scale of mapping used in the Comprehensive, Adequate and Representative (CAR) reserve system analysis for Western Australia (Government of Western Australia, 2017). The system-associations in the AOI are shown in Figure 4.

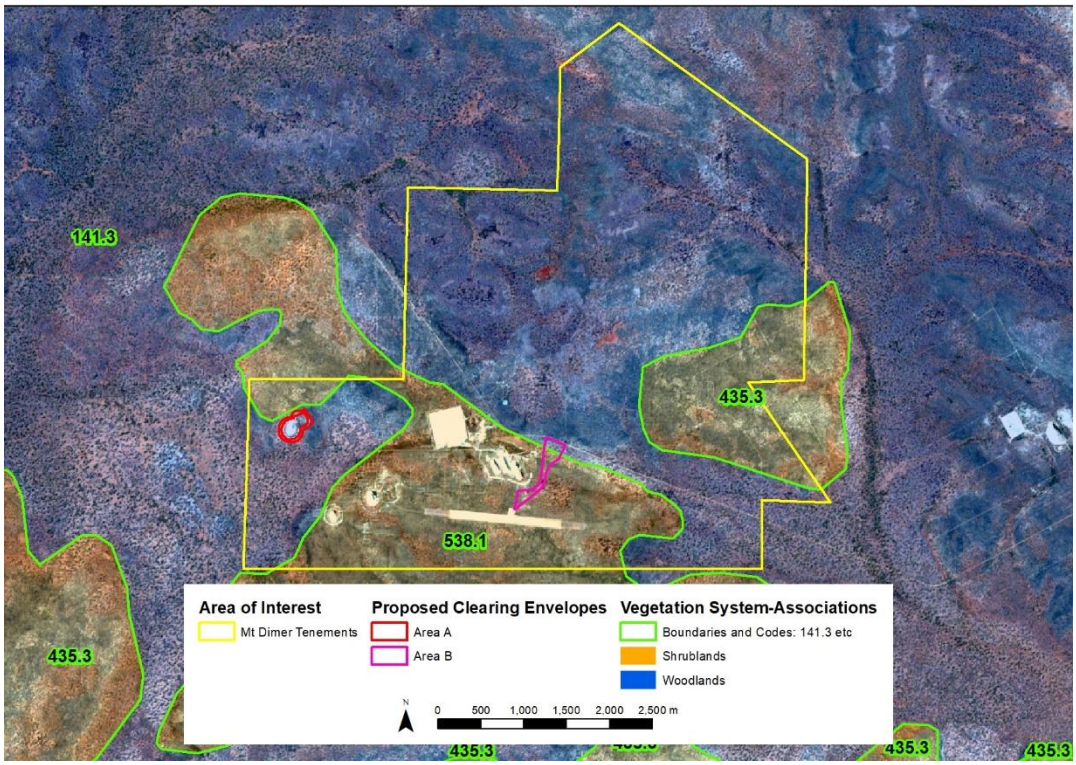

Figure 4: System-Associations in AOI

Source: Shepherd, Beeston and Hopkins (2002)

The state-wide vegetation associations and system-associations intersecting the clearing envelopes are extensive and have been subject to low levels of clearing, as shown in Table 1 and Table 2.

Table 1: Total Extents of Associations (state-wide basis)

Vegetation Association	Pre-European Extent	Current Extent	% Remaining	% Current Extent Protected (IUCN I-IV) for Conservation	Reservation Priority
141 Medium woodland; York gum, salmon gum & gimlet	1,158,760 ha	960,756 ha	82.91%	12.02%	Low
538 Shrublands; Acacia brachystachya scrub	147,822 ha	144,203 ha	97.55%	11.50%	Low

Sources: Government of Western Australia (2017), DPaW (2002)

Table 2: Total Extents of System-Associations (in the Jackson Vegetation System)

System-Association	Pre-European Extent	Current Extent	% Remaining	% Current Extent Protected (IUCN I-IV) for Conservation
141.3	644,280 ha	643,140 ha	99.82 %	15.60 %
538.1	100,912 ha	100,140 ha	99.26 %	14.27 %

Source: Government of Western Australia (2017)

Vegetation type is the EPA (2016) term for local scale vegetation units. The six vegetation types in the AOI are shown in Figure 5 and described in Table 3. Disturbance was only mapped for areas of extensive clearing, and this excluded current and historic tracks and drill pads. Most of the vegetation was in Very Good to Excellent condition.

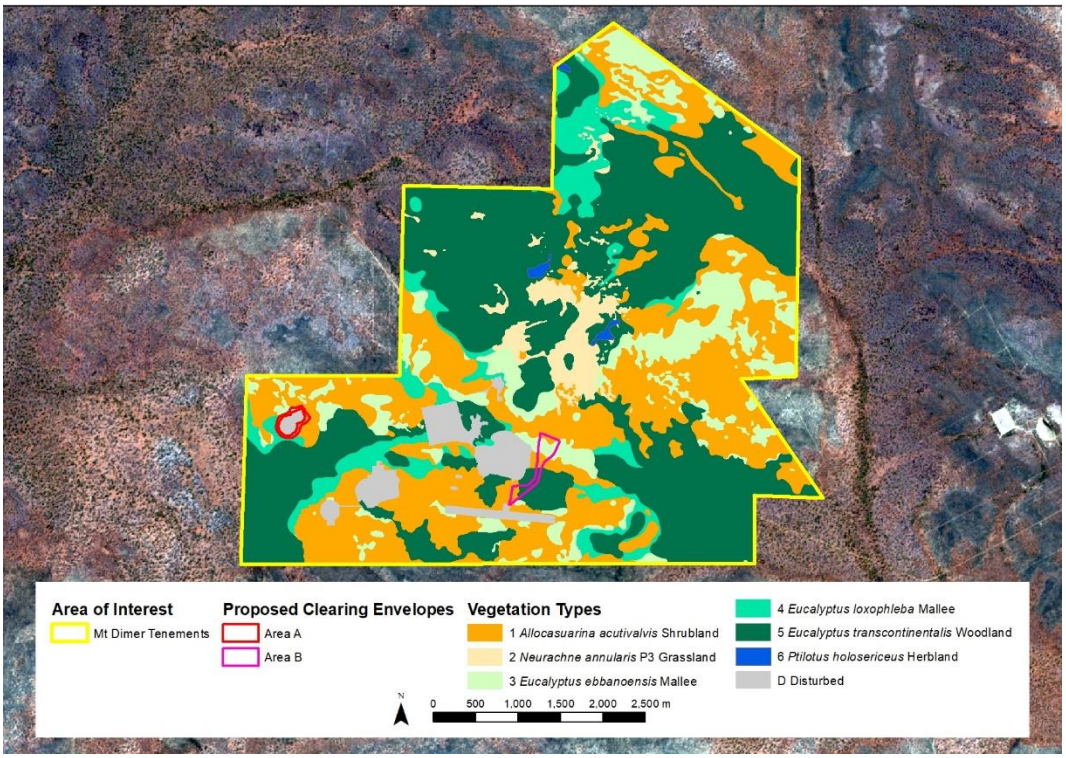

Figure 5: Distribution of Vegetation Types in AOI

Table 3: Vegetation Type Descriptions in AOI

Vegetation Type	Description
1: *Allocasuarina acutivalvis* Tall Shrubland over *Amphipogon caricinus* scattered tussock grasses	*Acacia sibina, Allocasuarina acutivalvis* subsp*. acutivalvis* Tall Shrubland over *Baeckea elderiana, Hibbertia eatoniae, Leucopogon* sp. Clyde Hill, *Phebalium canaliculatum* Shrubland over scattered *Amphipogon caricinus* grasses on clay loams and clay sands
2: Mixed Very Open Tree Mallee / Tall Open Shrubland over *Neurachne annularis* P3 Tussock Grassland	*Eucalyptus loxophleba* subsp*. lissophloia, Eucalyptus formanii* P4 Very Open Tree Mallee / *Acacia acuminata, Acacia sibina, Allocasuarina acutivalvis subsp. acutivalvis, Casuarina pauper, Melaleuca hamata* Tall Open Shrubland over *Neurachne annularis* P3 Tussock Grassland over *Cheilanthes adiantoides* scattered herbs on loam clays
3: *Eucalyptus ebbanoensis* Very Open Tree Mallee over *Triodia scariosa/tomentosa* Open Hummock Grassland	*Eucalyptus ebbanoensis subsp. ebbanoensis* Very Open Tree Mallee over *Eremophila caperata, Olearia exiguifolia, Phebalium tuberculosum, Westringia cephalantha var. cephalantha* Shrubland over *Triodia scariosa/tomentosa* Open Hummock Grassland on clay loams
4: *Eucalyptus loxophleba* Very Open Tree Mallee over *Austrostipa elegantissima* scattered tussock grasses	*Eucalyptus loxophleba* subsp. *lissophloia* Very Open Tree Mallee over *Acacia acuminata* Tall Shrubland over *Eremophila decipiens* subsp*. decipiens, Eremophila granitica, Olearia pimeleoides, Prostanthera grylloana* Shrubland over *Austrostipa elegantissima* scattered tussock grasses on sand clays
5: *Eucalyptus transcontinentalis* Woodland over *Austrostipa elegantissima* scattered tussock grasses	*Eucalyptus transcontinentalis, Eucalyptus salmonophloia, Eucalyptus vittata, Eucalyptus ravida* Woodland over *Santalum acuminatum* scattered trees and *Eremophila scoparia, Exocarpos aphyllus* scattered shrubs over *Templetonia ceracea* scattered low shrubs *Maireana georgei* scattered herbs with *Austrostipa elegantissima* scattered tussock grasses on sand clays and clays
6: *Ptilotus holosericeus* Very Open Herbland	*Ptilotus holosericeus* Very Open Herbland with *Eragrostis dielsii* scattered tussock grasses on clays

Vegetation types in the proposed clearing envelopes are shown in Figure 6 and their extents listed in Table 4.

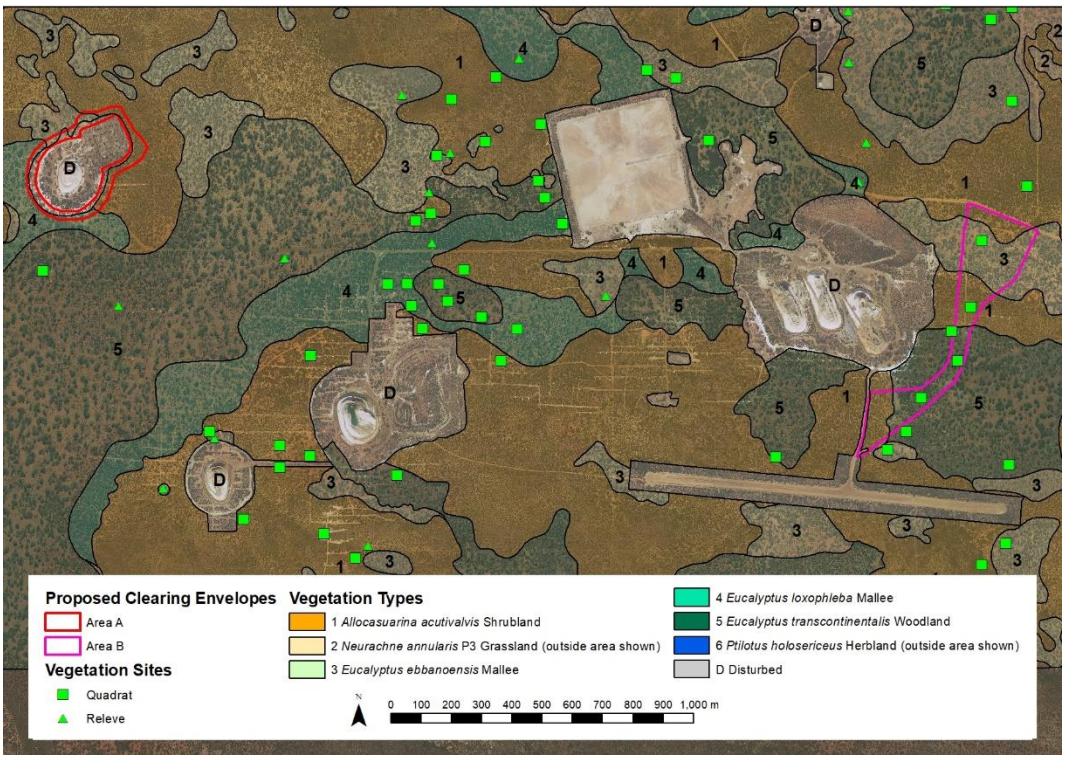

Figure 6: Distribution of Vegetation Types in Clearing Envelopes

Table 4: Extents of Vegetation Types

Vegetation Type	Extent in AOI	Extent in Area A	Extent in Area B	Extent in Areas A + B
1: *Allocasuarina acutivalvis* Tall Shrubland over *Amphipogon caricinus* scattered tussock grasses	844.8 ha	1.2 ha	4.1 ha	**5.3 ha**
2: Mixed Very Open Tree Mallee / Tall Open Shrubland over *Neurachne annularis* P3 Tussock Grassland	100.9 ha			
3: *Eucalyptus ebbanoensis* Very Open Tree Mallee over Triodia scariosa/tomentosa Open Hummock Grassland	314.1 ha	0.3 ha	3.5 ha	**3.9 ha**
4: *Eucalyptus loxophleba* Very Open Tree Mallee over *Austrostipa elegantissima* scattered tussock grasses	210.8 ha	0.5 ha		**0.5 ha**
5: *Eucalyptus transcontinentalis* Woodland over *Austrostipa elegantissima* scattered tussock grasses	1,193.9 ha		2.6 ha	**2.6 ha**
6: *Ptilotus holosericeus* Very Open Herbland	7.4 ha			
Disturbed	101.4 ha	1.5 ha	0.1 ha	**1.6 ha**
Total	**2,773.4 ha**	**3.5 ha**	**10.3 ha**	**13.9 ha**

2.2. Flora

The 281 plant taxa recorded in the AOI included 12 priority and 6 weed flora taxa.

The datasets compiled for *Mt Dimer Flora and Vegetation Desktop Assessment* (Woodgis, 2020) indicate there are 48 threatened and priority flora species within 20 km of the AOI. As listed in Table 5, 31 species are potentially associated with the major landforms of the AOI, which are predominately a plain of mixed gravel and sand, and a broad valley of sand/loam. Within Table 5, the priority flora species recorded in the AOI are shaded. As discussed in *Mount Dimer Vegetation and Priority Flora Update February 2022* (Woodgis, 2022):

- *Grevillea georgeana* P3 appears to have been erroneously documented as present in the AOI by Niche Environmental Services (2013); and
- *Lepidosperma lyonsii* P1 was recorded by Western Botanical (2020) in the AOI but is assumed to be *Lepidosperma* aff. *lyonsii* as PGV Environmental (2018) indicated *Lepidosperma lyonsii* P1 is restricted to the banded iron formation and related geologies, which were not present in the AOI.

The work by Woodgis (2022) documented priority flora populations at local and regional scales. Table 6 and Table 7 capture some of this information. It also, characterised the 12 priority flora taxa in the AOI as having:

- restricted distributions and possibly be in low abundance (this is for *Acacia* sp. Southern Cross P1 and *Hysterobaeckea ochropetala* subspecies *ochropetala* P1);
- restricted distributions, and possibly be under-reported rather than uncommon (this is for *Goodenia jaurdiensis* P2 and 3 *Cryptandra crispula* P3);
- restricted distributions but be locally abundant (this is for *Eremophila hamulata* P1 and *Neurachne annularis* P3);
- restricted distributions but be locally abundant and increasing after disturbance (this is for *Eucalyptus formanii* P4 and *Grevillea erectiloba* P4); or
- widespread distributions, and possibly be under-reported rather than uncommon (this is for *Austrostipa blackii* P3, *Notisia intonsa* P3, *Philotheca coateana P3* and *Eremophila caerulea* subsp. *merrallii* P4).

Table 5: Typical Habitat of Threatened and Priority Flora within 20 km of AOI

(shaded lines are the recorded priority species in the AOI)

Typical Landform Habitat	Status	Taxa
Hill (BIF)	T	*Acacia shapelleae*
Hill (BIF)	T	*Lepidosperma bungalbin*
Hill (BIF)	T	*Leucopogon spectabilis*
Hill (BIF)	T	*Tetratheca aphylla* subsp. *aphylla*
Hill (BIF)	T	*Tetratheca paynterae* subsp. *paynterae*
Hill (BIF)	P1	*Acacia adinophylla*
Hill (BIF)	P1	*Beyeria rostellata*
Hill (BIF)*	P1	*Eremophila hamulata*
Hill (BIF)	P1	*Lepidosperma lyonsii*
Hill (BIF)	P3	*Hibbertia lepidocalyx* subsp. *Tuberculata*
Hill (BIF)	P3	*Lepidosperma ferricola*
Hill (BIF)	P3	*Mirbelia ferricola*
Hill (BIF)	P3	*Phlegmatospermum eremaeum*
Hill (BIF)	P3	*Stenanthemum newbeyi*
Hill (BIF)	P4	*Banksia arborea*
Granite (sand/loam)	P3	*Acacia crenulata*
Plain (gravel/laterite)	P3	*Grevillea georgeana*
Plain (gravel/laterite)	P3	*Hysterobaeckea cornuta*
Plain (gravel/laterite)	P3	*Neurachne annularis*
Plain (gravel/laterite)	P4	*Eucalyptus formanii*
Plain (gravel/laterite)	P4	*Grevillea erectiloba*
Plain (sand)	P1	*Acacia* sp. Southern Cross
Plain (sand)	P1	*Baeckea* sp. Helena and Aurora Range
Plain (sand)	P1	*Chamelaucium* sp. Koolyanobbing
Plain (sand)	P1	*Dampiera plumosa*
Plain (sand)	P1	*Hysterobaeckea ochropetala* subsp. *ochropetala*
Plain (sand)	P1	*Persoonia leucopogon*
Plain (sand)	P2	*Thysanotus* sp. Yellowdine
Plain (sand)	P3	*Acacia cylindrica*
Plain (sand)	P3	*Acacia eremophila* var. *variabilis*
Plain (sand)	P3	*Acacia formidabilis*
Plain (sand)	P3	*Austrostipa blackii*
Plain (sand)	P3	*Banksia lullfitzii*
Plain (sand)	P3	*Calytrix creswellii*
Plain (sand)	P3	*Comesperma rhadinocarpum*
Plain (sand)	P3	*Cryptandra crispula*
Plain (sand)	P3	*Cyathostemon verrucosus*
Plain (sand)	P3	*Gompholobium cinereum*
Plain (sand)	P3	*Homalocalyx grandiflorus*
Plain (sand)	P3	*Labichea eremaea*
Plain (sand)	P3	*Melichrus* sp. Bungalbin Hill
Plain (sand)	P3	*Philotheca coateana*
Plain (sand)	P3	*Stylidium choreanthum*
Plain (sand)	P3	*Verticordia mitodes*
Plain (sand)	P4	*Sowerbaea multicaulis*
Broad Valley (sand/loam)	P2	*Goodenia jaurdiensis*
Broad Valley (sand/loam)	P4	*Eremophila caerulea* subsp. *merrallii*
Broad Valley (cracking clay)	P3	*Notisia intonsa*

**Eremophila hamulata* occurs on but is not restricted to BIF landforms (EPA, 2017) and is not associated with BIF in the AOI

Table 6: NatureMap Records of Priority Flora

	Taxa	NatureMap Records	WA Range (measured on NatureMap)	DBCA Managed Lands (containing NatureMap Records with ex-Jaurdi always included given tenement location)
Restricted Distribution	*Acacia* sp. Southern Cross P1	1 record 1 bioregion	<5 km north-south <5 km east-west	UCL - ex Jaurdi
	Eremophila hamulata P1	9 records 2 bioregions	300 north-south 130 km east-west	Mt Manning – Helena and Aurora Ranges Conservation Park Peak Charles National Park UCL - ex Jaurdi
	Hysterobaeckea ochropetala ssp. *ochropetala* P1	9 records 2 bioregions	150 km north-south 170 km east-west	Lake Campion Nature Reserve UCL - ex Jaurdi UCL - ex Diemals
	Goodenia jaurdiensis P2	11 records 1 bioregions	70 km north-south 45 km east-west	Mt Manning – Helena and Aurora Ranges Conservation Park UCL - ex Jaurdi
	Cryptandra crispula P3	11 records 1 bioregions	80 km north-south 80 km east-west	Dundas Nature Reserve UCL - ex Jaurdi
	Neurachne annularis P3	86 records 1 bioregion	80 km north-south 80 km east-west	Mt Manning – Helena and Aurora Ranges Conservation Park Mt Manning Nature Reserve UCL - ex Jaurdi UCL - ex Ennuin
	Eucalyptus formanii P4	191 records 3 bioregions	190 km north-south 70 km east-west	Mt Manning – Helena and Aurora Ranges Conservation Park Mt Manning Nature Reserve UCL - ex Jaurdi UCL - ex Diemals UCL- ex Mt Elvire
	Grevillea erectiloba P4	92 records 2 bioregions	120 km north-south 190 km east-west	Mt Manning – Helena and Aurora Ranges Conservation Park Mt Manning Nature Reserve UCL - ex Jaurdi Station UCL - ex Diemals UCL- ex Mt Elvire
Widespread Distribution	*Austrostipa blackii* P3	99 records 4 bioregions	400 km north-south 480 km east-west	Mount Manning Nature Reserve Kangaroo Hills Timber Reserve Yallari Timber Reserve Kambalda Timber Reserve Kambalda Nature Reserve Tutanning Nature Reserve UCL - ex Jaurdi UCL – ex Credo UCL – ex Diemals UCL - ex Ennuin UCL – ex Karara UCL - ex Warriedar
	Notisia intonsa P3	29 records 4 bioregions	490 km north-south 90 km east-west	Mt Manning – Helena and Aurora Ranges Conservation Park Dundas Nature Reserve UCL - ex Jaurdi Station UCL - ex Diemals UCL- ex Credo
	Philotheca coateana P3	16 records 2 bioregions	340 km north-south 180 km east-west	UCL- ex Mt Jackson UCL – ex Goongarrie
	Eremophila caerulea subsp. *merrallii* P4	40 records 3 bioregions	280 km north-south 310 km east-west	Mt Manning – Helena and Aurora Ranges Conservation Park Mt Manning Nature Reserve Jilbadji Nature Reserve

Philotheca coateana P3 based on ALA records – Naturemap taken offline indefinitely 17/12/2021

Table 7: Frequency of Priority Flora in Quadrats by Vegetation Types

Vegetation Type / Taxa	1	2	3	4	5	6
Acacia sp. Southern Cross P1					3%	
Eremophila hamulata P1					15%	
Hysterobaeckea ochropetala ssp. *ochropetala* P1	*					
Goodenia jaurdiensis P2						40%
Austrostipa blackii P3				10%		
Cryptandra crispula P3			*			
Neurachne annularis P3	3%	100%	23%	10%		
Notisia intonsa P3				10%	*	80%
Philotheca coateana P3			8%			
Eremophila caerulea subsp. merrallii P4					*	
Eucalyptus formanii P4	45%	33%	38%			
Grevillea erectiloba P4	23%					

* *Hysterobaeckea ochropetala* ssp. *ochropetala* P1 not recorded in any quadrats - only recorded opportunistically
Notisia intonsa P3 not recorded in quadrats in vegetation type 5 but recorded opportunistically
Philotheca coateana P3 not recorded in any quadrats - recorded in single relevé
Eremophila caerulea subsp. *merrallii* P4 not recorded in any quadrats - only recorded opportunistically
There were no quadrats placed in disturbed areas which cover 101.4 ha (3.7%) of the AOI.

The portions of local priority flora populations in Area A that are listed in Table 8, were based on the results of targeted surveys and mapping/estimates of populations documented by Woodgis (2022).

Table 8: Portion of Priority Populations in Area A

Taxa	Plants/Extent in Area A	Plants/Extent in AOI	Percent of AOI Plants/Extent in Area A
Neurachne annularis P3	0.005 ha	100.9 ha	0.0%
Eucalyptus formanii P4	37 plants	18,340 plants estimate	0.2%
Grevillea erectiloba P4	51 plants	17,724 plants estimate	0.3%

The portions of local habitat of priority flora populations in Area B are listed in Table 9 based on the extents of vegetation types documented by Woodgis (2022), as Area B was not included in a targeted flora survey.

Table 9: Portion of Priority Flora Habitat within AOI in Area B

Vegetation Type Extent in Area B Extent in AOI Taxa	1 4.1 ha 844.8 ha	3 3.5 ha 314.1 ha	5 2.6 ha 1,193.9 ha	D 0.1 ha 101.4 ha	Total
Acacia sp. Southern Cross P1			0.2%		0.2%
Eremophila hamulata P1			0.2%		0.2%
Hysterobaeckea ochropetala ssp. *ochropetala* P1	0.5%				0.5%
Cryptandra crispula P3		1.1%			1.1%
Neurachne annularis P3	0.5%	1.1%			0.7%
Notisia intonsa P3			0.2%		0.2%
Philotheca coateana P3		1.1%			1.1%
Eremophila caerulea subsp. merrallii P4			0.2%		0.2%
Eucalyptus formanii P4	0.5%	1.1%		0.1%	0.6%
Grevillea erectiloba P4	0.5%			0.1%	0.4%

Woodgis (2022) characterised 2 of the 12 priority flora taxa in the AOI as possibly having restricted distributions and possibly in low abundance:

- *Acacia* sp. Southern Cross P1 was recorded as a population of 28 plants in vegetation type 5 (4.6 km northeast of Area A and 2.9 km northeast of Area B). Vegetation type 5 occurs in Area B but not Area A. The taxon would have expected to have been detected, if present in Area B, whilst walking through the alignment to establish quadrats (see Figure 7); and
- *Hysterobaeckea ochropetala* subspecies *ochropetala* was recorded as a single plant adjacent to a quadrat in vegetation type 1 (1 km south east of Area A and 1.9 km west of Area B) by Western Botanical (2020), who could not locate any additional plants despite searches of the surrounds that were 'thorough and exhaustive'. Vegetation type 1 occurs in Area B but not Area A. P1 cannot be confidently located outside of flowering given there are a number of similar co-occurring myrtaceous species. The 2020/2021 surveys were outside this period to date (it was photographed flowering by Aurumin personnel in October, but wasn't flowering in September or November 2021 when the Woodgis was onsite).

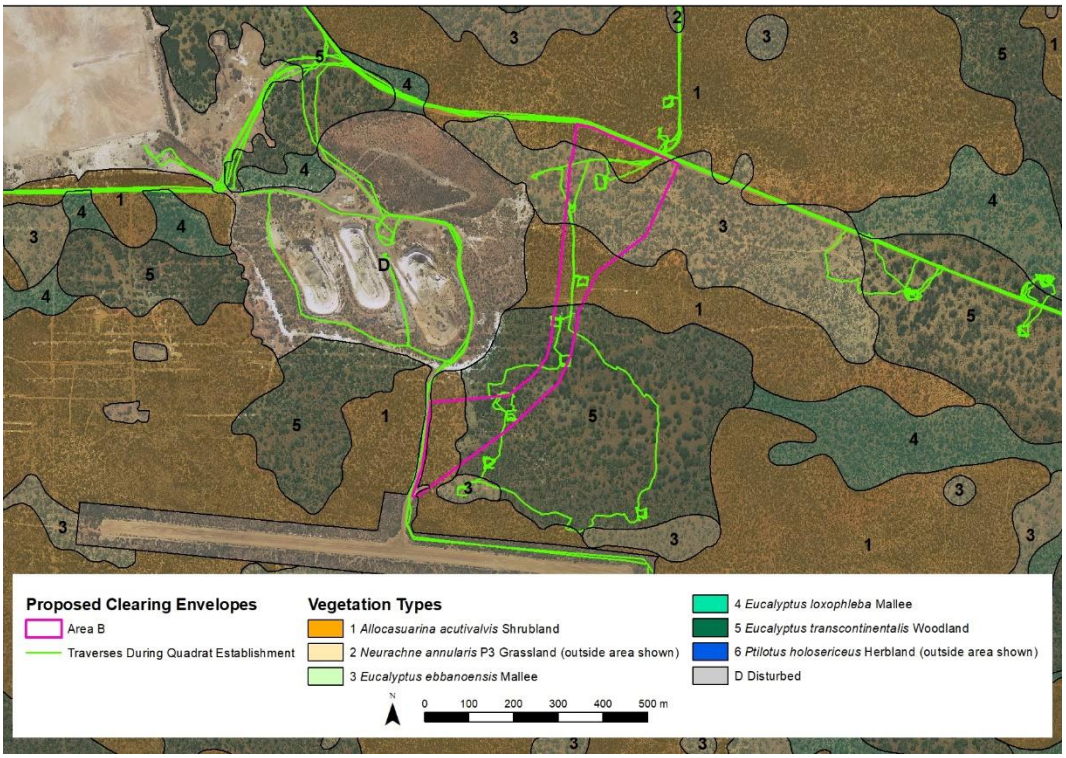

Figure 7: Traverses Through Area B During Quadrat Establishment

3. SELECTED CLEARING PRINCIPLES

3.1. Principle A: Biological Diversity

The proposed clearing is not likely to be at variance to Principle A: Native vegetation should not be cleared if it comprises a high level of biological diversity flora as this was the conclusion in Department of Mines, Industry Regulation and Safety (DMIRS) Clearing Permit Decision Report 8291/1 for the clearing of 20.8 hectares for an airstrip expansion and associated upgrades at Mt Dimer in 2019. Area B is contiguous with this clearing that occurred in 2019.

The clearing of 3.5 hectares is proposed to occur within the two envelopes (Area A and B totalling 13.9 hectares) within a 2,773 hectares AOI which has been subject to comprehensive flora and vegetation surveys. This comprehensive work is documented in the *Mount Dimer Vegetation and Priority Flora Update February 2022* (Woodgis, 2022). Surveys within the AOI included:

- A total of 99 quadrats and 24 relevés were established, sampling all landform and geology units at a density of one quadrat/relevé per 22.5 ha;
- Targeted flora searches were undertaken over two areas totalling 459 hectares with traverses at 20-25 metre spacing; and
- An estimated 100% of the perennial plant taxa and 74% of the annual plant taxa present were recorded.

The clearing envelopes do not appear to represent an area of higher biodiversity than surrounding areas in either a local (i.e. the 2,773 hectare AOI) or regional context.

The state-wide system-associations are extensive and have been subject to low levels of clearing.

No Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) were recorded in the AOI either in the DBCA database (search reference number Ref: 48-1020EC) or field surveys. All the TECs/PECs within 50 km of the AOI are associated with Banded Iron Formations (BIF). No landforms occur in the AOI that have an elevated likelihood of supporting restricted vegetation or flora (Banded Ironstone Formations, granite outcrops, riparian vegetation or permanent surface water). Also, the six vegetation types would also not expected to be restricted regionally and the two vegetation types most restricted in the AOI do not occur in the clearing envelopes (*Ptilotus holosericeus* herblands were associated with damplands, and *Neurachne annularis* P3 grasslands).

The datasets compiled for the Mt Dimer Flora and Vegetation Desktop Assessment (Woodgis, 2020) indicate there are 48 threatened and priority flora species within 20 km of the AOI. The proposed clearing is unlikely to affect the conservation status of any of the 12 priority flora taxa identified in the AOI. Woodgis (2022) characterised 2 of the 12 priority flora taxa in the AOI as possibly having restricted distributions and possibly in low abundance. These priority flora taxa were:

- *Acacia* sp. Southern Cross P1 that was recorded 4.6 km northeast of Area A and 2.9 km northeast of Area B; and
- *Hysterobaeckea ochropetala* subspecies *ochropetala* that was recorded 1 km south east of Area A and 1.9 km west of Area B.

Six weed species were recorded in the AOI. To prevent potential impacts to biodiversity appropriate soil and weed hygiene practices will be implemented.

3.2. Principle C: Rare Flora

The proposed clearing is not likely to be at variance to Principle C: native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora as this was the conclusion in DMIRS Clearing Permit Decision Report 8291/1 for the clearing of 20.8 hectares for an airstrip expansion and associated upgrades at Mt Dimer in 2019. Area B is contiguous with this clearing that occurred in 2019.

No Threatened flora was recorded within the AOI and it was estimated that 100% of the perennial plant taxa and 74% of the annual plant taxa present were recorded in the AOI.

The five threatened flora taxa recorded within 20 km of the AOI are all associated with Banded Ironstone Formations (BIF), a landform that does not occur in the AOI.

The vegetation types in the clearing envelopes are not of elevated likelihood of supporting rare flora as the vegetation types are not expected to be restricted given none were associated with either BIF, granite outcrops, riparian vegetation or permanent surface water features.

3.3. Principle C: Conservation Area

The proposed clearing is not likely to be at variance to Principle H: native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area as this was the conclusion in DMIRS Clearing Permit Decision Report 8291/1 for the clearing of 20.8 for an airstrip expansion and associated upgrades at Mt Dimer in 2019. Area B is contiguous with above clearing that occurred in 2019.

The proposed 3.5 hectares of clearing would not significantly impact on the extent, or result in fragmentation, of the DBCA-managed lands in which it is located. The clearing envelopes are located on Unallocated Crown Land (former Jaurdi station which is proposed to be a 5(1)(H) Reserve managed for the purposes of Conservation and Mining). The 290,285 hectare former Jaurdi Pastoral Lease (proposed 5(1)(H) Reserve) is part of 1,186,892 hectares of contiguous conservation estate (that includes Mount Manning - Helena and Aurora Ranges Conservation Park, Mount Manning Nature Reserve, and other Nature Reserves).

The clearing in Area A is to facilitate works to improve conservation values as it comprises clearing around the perimeter of the Karli West open pit abandonment bund and the Karli West Waste Rock Dump, to provide access, locations to stockpile topsoil, working zones to complete remedial actions to prevent erosion, and allow for the installation of sediment capture structures.

The approximately 1 km track to be constructed in Area B does not add significantly to the total length of unsealed tracks in the former Jaurdi station, with 575 km of the more substantial tracks present according to mapping by Geoscience Australia in 2006. Clearing for the track will be partially offset by closing and revegetating old tracks no longer required across the Mt Dimer Project.

The clearing envelopes do not intersect:

- any Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs);
- state-wide system-associations that are restricted or extensively cleared;
- any vegetation types that are expected to be restricted; or
- Banded Ironstone Formations (BIF), granite outcrops, riparian vegetation or permanent surface water.

To prevent potential impacts to biodiversity appropriate soil and weed hygiene practices will be implemented.

REFERENCES

DPaW. (2002). *A Biodiversity Audit of WA's 53 Biogeographical Subregions 2002*. (DPaW) Retrieved 07 04, 2016, from Pilbara Region Biological Survey 2002-2013, Previous Pilbara Biodiversity Audits: https://www.dpaw.wa.gov.au/about-us/science-and-research/biological-surveys/117-a-biodiversity-audit-of-wa

EPA. (2007). *Bulletin 1256 - Advice on areas of the highest conservation value in the proposed extensions to Mount Manning Nature Reserve.* Perth: Environmental Protection Authority.

EPA. (2016). *Technical Guidance Flora and Vegetation Surveys for Environmental Impact Assessment.* Western Australia: Environmental Protection Authority.

EPA. (2017). *Report and recommendations of the Environmental Protection Authority - Jackson 5 and Bungalbin East Iron Ore Project .* Perth: Environmental Protection Authority.

Government of Western Australia. (2017). *2016 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of October 2016.* Perth: WA Department of Parks and Wildlife, https://www2.landgate.wa.gov.au/web/guest/downloader. Retrieved from https://www2.landgate.wa.gov.au/web/guest/downloader

Niche Environmental Services. (2013). *Targeted flora searches along proposed drill lines and drill pad locations within tenements M77/427, M77/428, M77/957 and M77/958 of the Mt Dimer project area and tenement M77/965 of the Woodcutters project area.* unpublished report for Vector Resources Ltd.

PGV Environmental. (2018). *Sandy Ridge Project, Exploration Tenement E16/440 -Targeted Significant Flora Survey.* Perth: unpublished report by PGV Environmental for Tellus Holdings P/L.

Shepherd, D., Beeston, G., & Hopkins, A. (2002). *Native Vegetation in Western Australia: extent, type and status. Resource Management Technical Report 249.* Perth: Department of Agriculture, Western Australia.

WA Museum. (1985). *The biological survey of the eastern Goldfields of Western Australia. Part 3. Jackson-Kalgoorlie study area.* Perth: Western Australian Museum.

Western Botanical. (2020). *Flora and Vegetation of the Mount Dimer Tenements.* Mount Helena: unpublished report for Aurumin Pty Ltd.

Woodgis. (2020). *Mt Dimer Flora and Vegetation Desktop Assessment.* Perth: unpublished report by Woodgis Environmental Assessment and Management for Aurumin Ltd.

Woodgis. (2021a). *Mount Dimer Targeted Flora Survey 2020.* Perth: unpublished report by Woodgis Environmental Assessment and Management for Aurumin.

Woodgis. (2021b). *Mount Dimer Targeted Flora Survey March 2021.* Perth: unpublished report by Woodgis Environmental Assessment and Management for Aurumin.

Woodgis. (2021c). *Woodcutter Tenements Targeted Flora Survey May 2021.* Perth: unpublished report by Woodgis Environmental Assessment and Management for Aurumin.

Woodgis. (2021d). *Mount Dimer Priority Flora Update July 2021.* Perth: unpublished report by Woodgis Environmental Assessment and Management for Aurumin.

Woodgis. (2021e). *Mount Dimer Vegetation and Priority Flora Update October 2021.* Perth: unpublished report by Woodgis Environmental Assessment and Management for Aurumin.

Woodgis. (2022). *Mount Dimer Vegetation and Priority Flora Update February 2022.* Perth: unpublished report by Woodgis Environmental Assessment and Management for Aurumin.