

APPENDIX 6: DIEBACK ASSESSMENT

16.11.2023

Our reference: BARK08.2023v1
Enquiries: Bruno Rikli M: 0400 208 582

Doral Mineral Sands Pty Ltd
25 Harris Road
Picton WA 6229

Phytophthora Dieback Assessment Report - Yalyalup Mine Northern Extension

Doral Mineral Sands (Doral) engaged BARK Environmental to undertake a Phytophthora Dieback (Dieback) occurrence assessment and concise report for the proposed northern section of proposed mining in Yalyalup, Western Australia. The assessment area is located approximately 9 kilometres (km) south east from the City of Busselton and was 878 hectares (ha) in size.

The comprehensive assessment method was applied in accordance with the manual "Forest and Ecosystem Management Division 2015, Phytophthora Dieback Interpreter's manual for lands managed by the department, DPaW, Perth, Western Australia". This assessment was completed by a Dieback Interpreter with over 30 years of experience who is registered with the Department of Biodiversity, Conservation and Attractions and is on the management committee of W.A.'s Dieback Working Group Inc..

This short report details the results that concluded, notwithstanding any regulatory advice, the Dieback management required for disturbance activities within the assessment area should be simple.

Two recommendations are:

- Maintain clean-down protocols on entry and exit for all preliminary non-disturbance site access.
- It is suggested to complete the most current DBCA template for a *Phytophthora Dieback Risk Assessment and Management Plan Form* when the details of disturbance activities are known. This will determine the risk rating of the proposed activity and the appropriate management tactics to deploy to minimise the potential introduction or spread of the pathogen during disturbance activities.

If you have any queries about this report, please contact BARK Environmental.

Sincerely,

Bruno Rikli

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ARRIVE CLEAN - LEAVE CLEAN in all natural areas!

Phytophthora Assessment Report – Yalyalup Mine Northern Extension

BARK Environmental

Background and Assessment Area

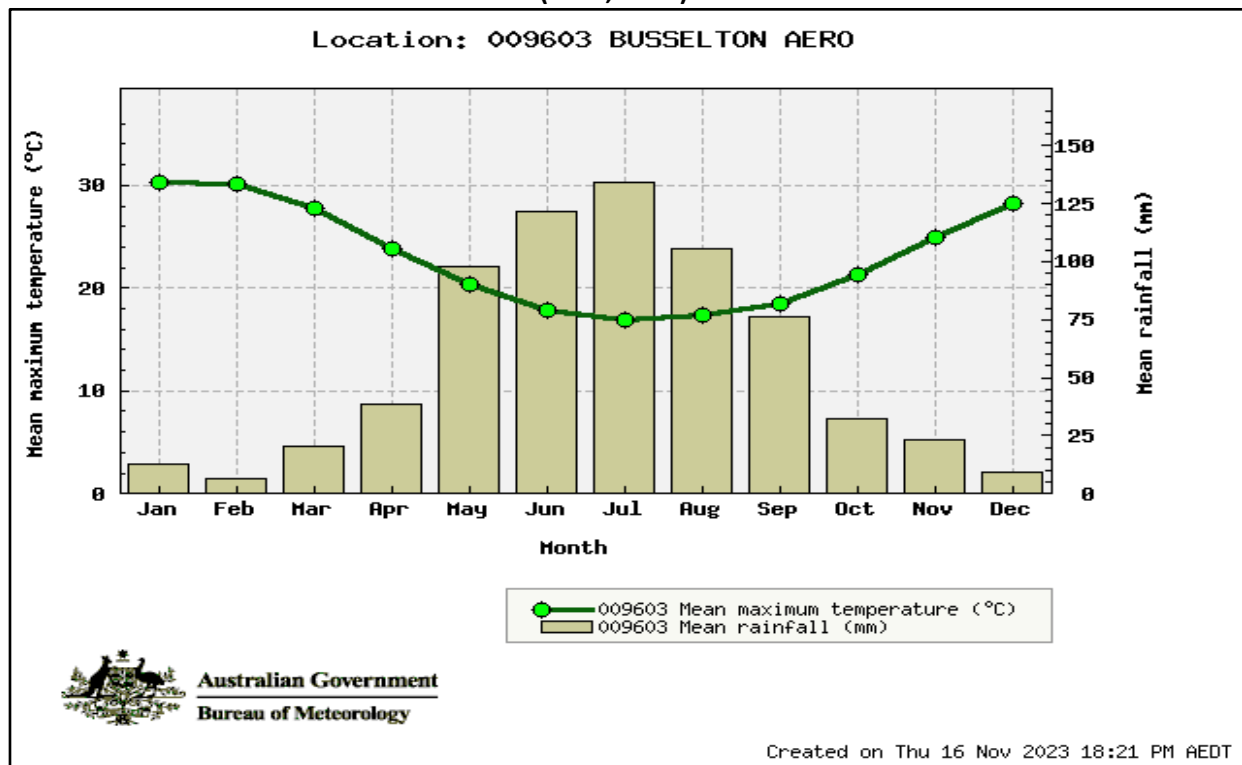
The assessment area is situated within the Swan Coastal Plain (SWA02) sub-region of the Swan Coastal Plain biogeographic region (Commonwealth of Australia 2016). The assessment area has predominantly been historically cleared for grazing and pasture. It is flat and poorly drained with seasonally wet soils. Much of this area has been classed as ‘Multiple Use’ palusplain wetland (Tille and Lantzke 1990).

The Abba Vegetation complex extends over the entire area described by Webb et al (2016) as: *A mixture of open forest of Corymbia calophylla (Marri) – Eucalyptus marginata (Jarrah) - Banksia species and woodland of Corymbia calophylla (Marri) with minor occurrences of Corymbia haematoxylon (Mountain Marri). Woodland of Eucalyptus rudis (Flooded Gum) - Melaleuca species along creeks and on flood plains.*

There was no evidence of recent fire damage that could limit this assessment. No previous Dieback assessment has been undertaken within the assessment area. One proximate DIDMS sample record seven positive samples identified a positive sample result was collected from a *Xanthorrhoea preissii* near a roadside drain and cluster of samples over 2 km to the east near Princefield Road, however none of these have a consequence for this assessment.

The assessment areas climate is Mediterranean and supports *Phytophthora* development. It also falls within the south west region’s vulnerable zone (DPaW, 2015). This is evident when looking at the long-term climate statistics data for temperature and rainfall collected from the Busselton Aero weather station 009603 for years 1997 to 2023 (Table 1).

Table 1: Climate Statistics – Busselton Aero (BoM, 2023)



Results

All vegetated areas were assessed and a Dieback Occurrence Map has been prepared (see Figure 1 attached). Photographic evidence of the assessment area is given in attachment A.

No observable factors indicating the presence of disease caused by *Phytophthora cinnamomi* were present during this 2023 assessment. There was an overall absence of indicator plant species remaining within the extensively cleared, grazed and Degraded to Completely Degraded native vegetation clumps remaining in paddocks.

The occurrence categories mapped included the Excluded category over the entire survey area boundary and a small portion of Uninterpretable adjacent to the assessment boundary. These categories are described in table 2. The Excluded category was applied to all Degraded and Completely Degraded native vegetation condition areas (Keighery, 1994) that were extensive, as well as cleared and disturbed paddocks with no intact vegetation structure remaining. Some widely scattered random paddock tree/plant deaths are present within and beyond the assessment area and these may be attributed to a range of causal factors such as waterlogging, drought, disturbance, insect attack, senescence and potentially common fungi.

The Uninterpretable category was applied to a small triangular fenced area located southeast of Princefield Road that has been fenced to protect a population of known Threatened flora, *Verticordia plumosus var. vassensis* (Ecoedge, 2023). It is understood that this Uninterpretable area will not be disturbed by the proposed mining activity and falls outside of the development envelope. An area statement for the mapped occurrence categories is given in table 3.

Table 2: Phytophthora Occurrence Categories (FEMD, 2015)

Phytophthora occurrence category	Description
Infested	Determined to have plant disease symptoms consistent with the presence of <i>Phytophthora cinnamomi</i> .
Uninfested	Determined to be free of plant disease symptoms which indicates the presence of <i>Phytophthora cinnamomi</i> .
Uninterpretable	Where susceptible plants are absent or too few to enable the interpretation of <i>Phytophthora cinnamomi</i> presence or absence.
Temporarily Uninterpretable	Areas of temporary disturbance where natural vegetation is likely to recover.
Not Yet Resolved	Areas where <i>Phytophthora cinnamomi</i> occurrence diagnosis cannot be easily made within the required timeframe because of inconsistent evidence.
Excluded (transparent white on Figure 1 herein).	Areas of long-term high disturbance where natural vegetation has been cleared and is unlikely to recover.

Table 3: Area Statement

Occurrence categories	Area (ha)
Infested	0.00
Uninfested	0.00
Uninterpretable	0.17
Temporarily Uninterpretable	0.00
Excluded	878.07
Total	878.24

No samples were collected during this assessment as there were no suitable dead or dying indicator plants present. The historic sample points in the greater area contain/ed native vegetation and suitable indicator plants at some point, unlike this 2023 assessment area. No demarcation with flagging tapes was required and the single Uninterpretable area is clearly delineated by a perimeter fence with signage.

Conclusion

This comprehensive assessment over approximately 878 hectares (ha) of Doral's proposed mine extension resulted in the majority of the area being mapped as Excluded due to historic disturbance, current grazing, pasture and Degraded to Completely Degraded native condition remaining. The native vegetation structure and communities are no longer intact across the assessment area resulting in an absence of, or too few, suitable indicator plants that are essential to enable Dieback assessment. It is suggested that all Excluded areas are considered as unprotectable from Phytophthora disease given their extensive past and current disturbance, land uses and in large parts seasonal waterlogging. One small area of Uninterpretable vegetation was included in this assessment where known Threatened flora exist, but it is understood that this fenced area will not be disturbed by the proposed mining. Notwithstanding any regulatory advice, based on the results herein and site characteristics, the Dieback management required during disturbance activities within the subject area should be simple.

Recommendations

- Maintain clean-down protocols on entry and exit for all preliminary non-disturbance site access.
- It is suggested to complete the most current DBCA template for a *Phytophthora Dieback Risk Assessment and Management Plan Form* when the details of disturbance activities are known. This will determine the risk rating of the proposed activity and the appropriate management tactics to deploy to minimise the potential introduction or spread of the pathogen during disturbance activities.

References

- Bureau of Meteorology (BoM). 2023. Climate statistics online, accessed 16.11.2023. <http://www.bom.gov.au/climate/averages>.
- Department of Biodiversity, Conservation and Attractions (DBCA). 2020. Phytophthora Dieback Management Manual, October 2020, DBCA, Perth.
- Ecoedge. 2023. Reconnaissance and Targeted Flora and Vegetation Survey - Proposed Yalyalup Mine Northern Extension - Yalyalup, Western Australia.
- Forest and Ecosystem Management Division (FEMD). 2015. Phytophthora Dieback Interpreter's manual for lands managed by the department, DPaW, Perth, Western Australia".
- Keighery, B. J. 1994. Bushland Plant Survey: A guide to plant community survey for the community. Wildflower Society of WA Inc.
- Mapping to Landform boundaries within the Swan Coastal Plain Landform and Forested Region of South West Western Australia. Department of Parks and Wildlife, Bunbury, WA.
- Tille, P. J., and Lantzke, N. C. 1990. Busselton, Margaret River, Augusta: land capability study. Department of Primary Industries and Regional Development, Western Australia, Perth. Report 5.
- Webb, A., Kinloch, J., Keighery, G. and Pitt, G. 2016. The Extension of Vegetation Complex.

APPENDIX A – Site photographs Yalyalup – Recorded September 2023



Plate 1. Example of Excluded area with no indicator plants remaining.

360827 / 6273261



Plate 2. Excluded Degraded area with mid-storey *Melaleuca* sp.

359212 / 6273922



Plate 3. Excluded, native plants are absent.

358875 / 6273783

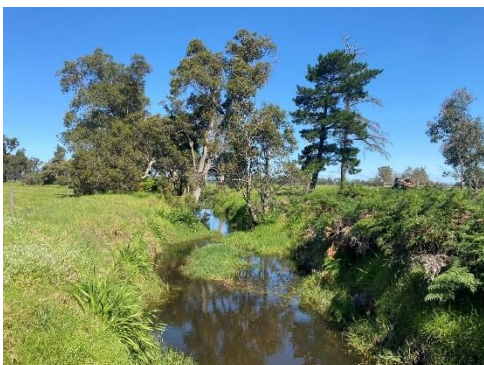


Plate 4. Excluded area along drainage line.

359814 / 6272581



Plate 5. Excluded corridor of planted trees unsusceptible to *Phytophthora cinnamomi*.

360529 / 6272262



Plate 6. Excluded disturbed area with no native understorey.

361262 / 6272276



Plate 7. Excluded paddocks with corridor of non-susceptible trees.

356609 / 6271697

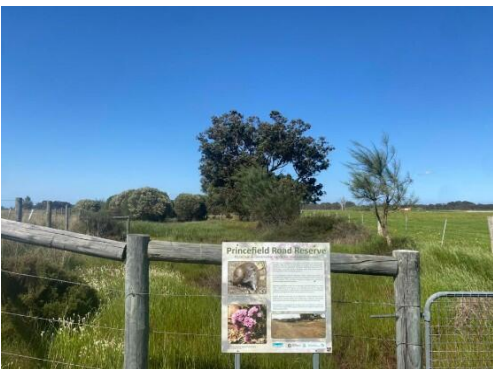
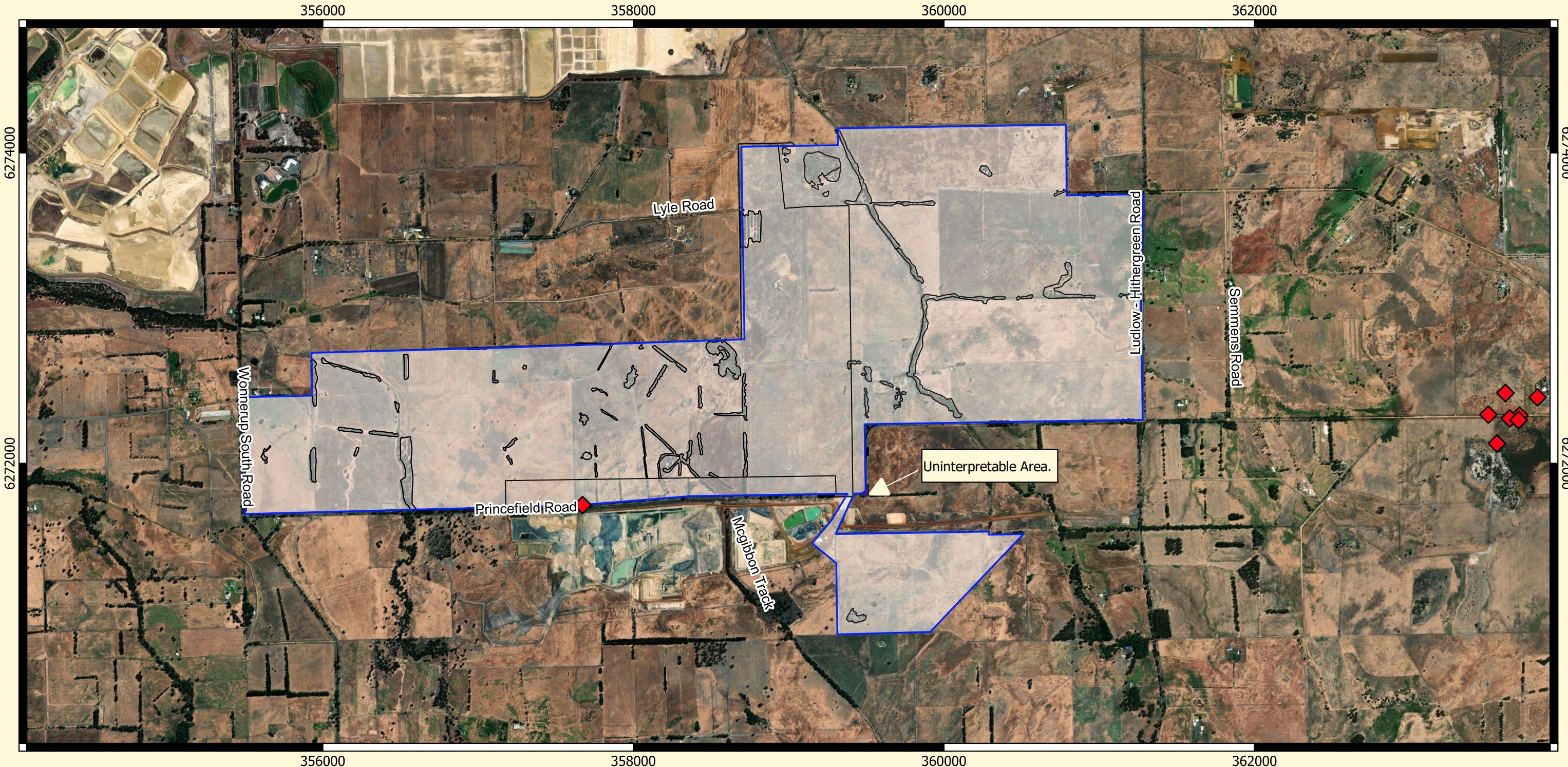


Plate 8. The small fenced Uninterpretable area with Threatened flora (see below for location).

Southeast of Princfield Road





Legend

- Assessment Area
- Excluded
- Uninterpretable
- Vegetation Areas Assessed
- 2m contours (DPIRD_072_1)
- ◆ Positive Sample Points: DIDMS (2021)

Interpreter: B. Rikli
 Assessment completion: 30/09/2023
 Interpretation Method: Comprehensive

Map Validity:
 Map revalidation due on 30/09/2024. This map should not be used for operational purposes for more than 1 year after assessment completion. Map may be revalidated after a re-check assessment for up to 3 years following initial assessment (This map expires on 30/09/2026).

Map limitations:
 Information shown on this map is positioned relative to mapped features and was captured by hand-held GPS so it may not be entirely accurate. Therefore, field demarcation should be followed.

Area Statement

Occurrence categories	Area (ha)
Infested	0.00
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Uninterpretable	0.17
Temporarily Uninterpretable	0.00
Excluded	878.07
Total	878.24

Datum: GDA 94
 Projection: MGA Zone 50

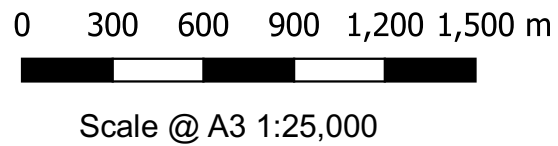


Figure 1.
Dieback Occurrence Map:
Yalyalup Mine

Bark Job:
 BARK_08_2023

Version 1

