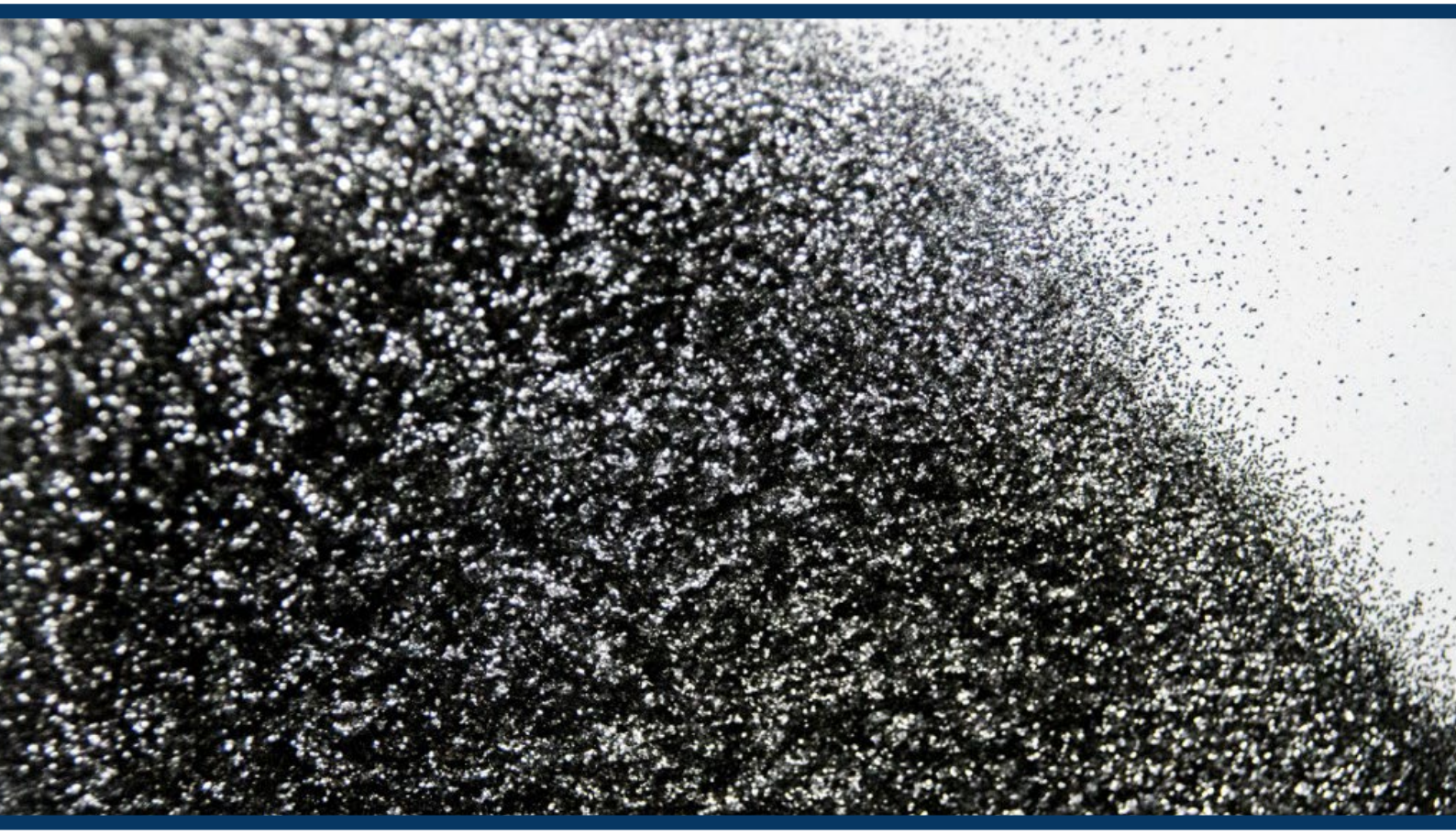
MRC GRAPHITE PTY LTD



Document No. MRCG-PRJ-ENV-PLN-0002

MUNGLINUP GRAPHITE PROJECT
DIEBACK
MANAGEMENT PLAN

Prepared by Integrate Sustainability

integrate SUSTAINABILITY
environment safety community

Document Control

Rev	Author	Changes	Date of Issue
Rev 1	Integrate Sustainability Pty Ltd	Document prepared for Exploration Activities	September 2018
Rev 2	Integrate Sustainability Pty Ltd	Integrate Sustainability Pty Ltd (Format revised to align with EPA EMP format)	May 2020
Rev 3	Integrate Sustainability Pty Ltd	Revised to include Client Feedback	June 2020
Rev 4	Integrate Sustainability Pty Ltd	Revised to include DMA Feedback	November 2020

Disclaimer

Corporate Endorsement

I hereby certify that to the best of my knowledge, the information contained within this Environmental Management Plan is true and correct, and addresses all the requirements of the Instructions on how to Prepare *Environmental Protection Act 1986* Part IV Environmental Management Plans.

Name: Mark Caruso

Position: Executive Chairman

Signed:

Date: 6/11/2020

Table of Contents

List of Figures

List of Tables

Summary

Table 1 Summary of the Dieback Environmental Management Plan

Item	Description
Title of Proposal	Munglinup Graphite Project
Proponent Name	MRC Graphite Pty Ltd
Ministerial Statement Number	Not available at this point
Purpose of the Management Plan	This management plan is submitted in support of assessment under the *Environmental Protection Act 1986* and *Environmental Protection and Biodiversity Conservation Act 1999.*
Key Environmental Factors	Dieback
Objectives	Prevent loss of condition or death of native vegetation and impacts to Priority flora due to the introduction and/or spread of *Phytophthora cinnamomi* (dieback)
Condition Clauses	Not applicable
Key Provisions	• Provision of wash down facilities (No dieback spread throughout the Project). • Restrictions on movement of vehicles outside of main access roads (No dieback spread throughout the Project). • Use of a Ground Disturbance Permit system to highlight dieback management requirements when land clearing is being undertaken (No dieback spread throughout the Project).

1. Context, Scope and Rationale

This Environmental Management Plan (EMP) for Dieback has been prepared to support environmental assessment under the *Environmental Protection Act 1986* and *Biodiversity and Conservation Act 1999* for the Munglinup Graphite Project (the Project) proposed by MRC Graphite Pty Ltd a wholly owned subsidiary of Mineral Commodities Limited (MRC).

This EMP has been prepared in accordance with the requirement of the *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (EPA, 2020).

1.1 Proposal

The Munglinup Graphite Project (the Project) is a joint venture between MRC Graphite Pty Ltd (MRC), the operator, and Gold Terrace Pty. Ltd. The project is located 105km west of Esperance, 85km east of Ravensthorpe and 4km north of the town of Munglinup in the south coast region of Western Australia (Figure 1). Access to the Project is currently from the South Coast Highway and the local Mills and Reynolds Roads.

Figure 1 Project Location

The project is predominantly situated within Mining Reserve R24714 on M74/245, G74/9, L74/55 and L74/56. Graphite within the Project area has been identified, studied and historically mined by several companies over the last 100 years. The Project has a proposed maximum disturbance footprint of 350ha within a development envelope that covers 650ha. Past clearing onsite has been limited to historic shafts and exploration pads and drill lines, the majority of 350ha will be new disturbance.

The graphite deposits are proposed to be mined via open cut methods with multiple open cut pits mined over an estimated 10-15-year mine life. The locations of the proposed open pits are shown in Figure 2 (purple area) along with associated infrastructure. Approximately 3.5 million tonnes of material (ore and waste) will be mined per annum, the project has a strip ratio of 5:1. Table 2 provides a breakdown of the disturbance associated with each proposed activity.

Table 2 Maximum Disturbance Footprint

Element	Footprint (ha)
Open Pits	63
Waste Rock Landform	120
Tailings Storage Facility	86
Supporting Infrastructure	11
Haul/LV Roads	40
Topsoil & Vegetation Stockpiles	30
Total Disturbance	**350**

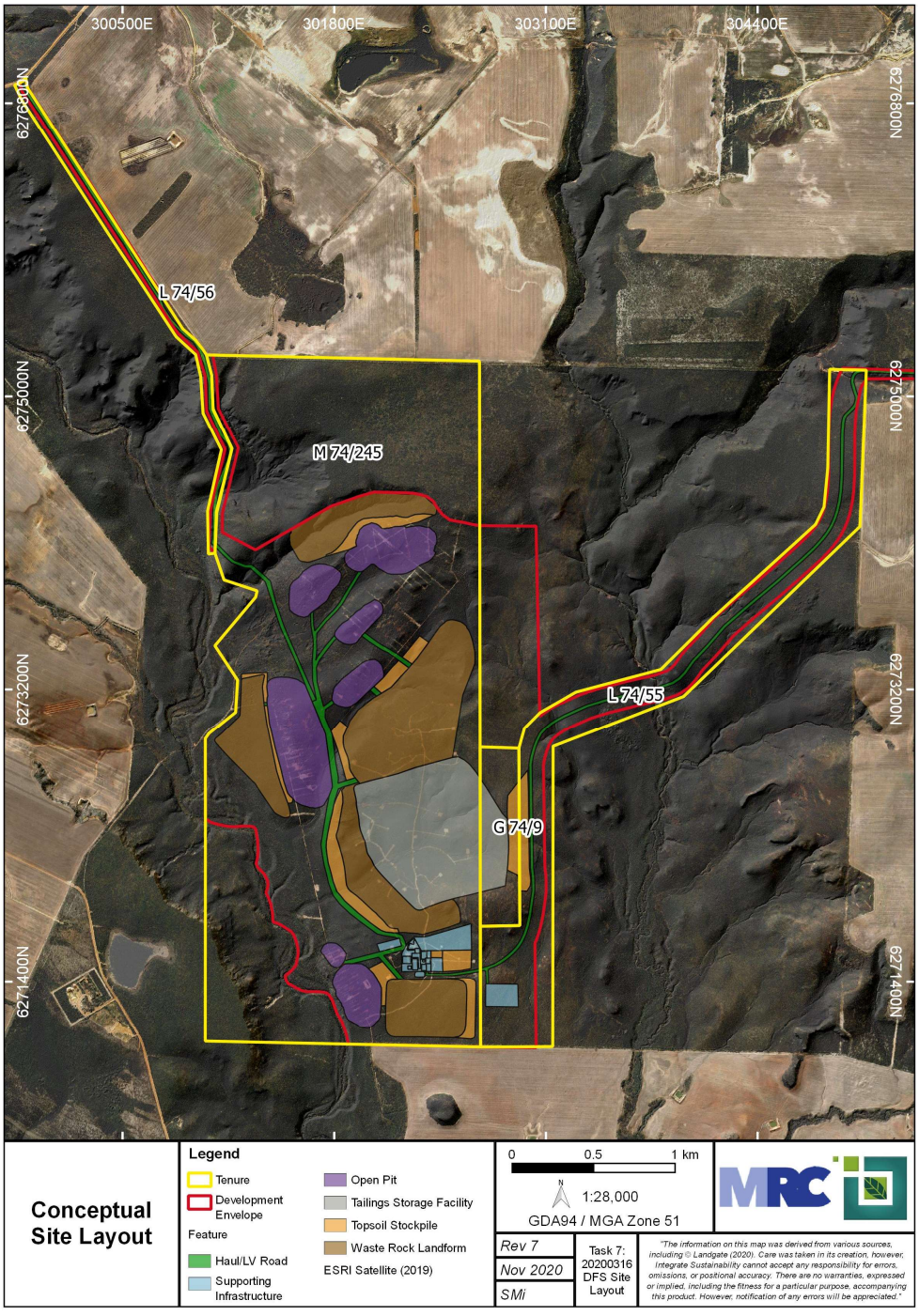


Figure 2 Project Development Envelope and Conceptual Site Layout

The open pits are anticipated to be mined by free dig however, some drill and blast activities may be required. Ore from each of the open pits will be transported to a run-of-mine (ROM) pad located to the south-east on M74/245. Ore will then be processed through an onsite processing facility. The pits are estimated to range in depth from 32m to 120m below ground level. The open pits will extend below ambient groundwater levels (2.4 to 8m below ground level) (Rockwater, 2020).

On-site stockpiling and processing will produce graphite via a crushing, grinding and flotation circuit operating on a 24/7 operation basis. The plant has a proposed annual throughput of up to 500kt per annum of ore, producing a peak of 80-85kt of graphite per year with disposal of up to 350kt of tailings per annum in a lined facility.

MRCG proposes to place the processing waste in a single tailings storage facility (TSF) located in the south-east of M74/245 and partially on G74/9 between two ridges where the natural topography dips in a south-west direction. The TSF will utilise the two ridges to reduce total embankment fill requirements (KCB, 2018). The western perimeter of the proposed TSF site is approximately 500m from the Munglinup River. Tailings material from the rougher and cleaner flotation circuits will report to a tailings thickener before being pumped to the TSF.

The Project has an estimated water demand of 0.5GL/annum or 16.5L/second which will be used for dust suppression and processing. Preliminary results suggest that 50-75% of the water will be sourced from dewatering the pits and the TSF decant water with the remainder coming from production bores (Rockwater, 2020).

1.2 Scope and Objectives

This *Dieback Management Plan* applies to potential direct and indirect impacts of the implementation of the Munglinup Graphite Project impacts to priority flora in and near the project area. The objectives of the plan are to:

- Identify the key project activities that will directly or indirectly impact terrestrial flora or vegetation through the introduction of Dieback.
- Describe the process to avoid or minimise the introduction of Dieback to the project area.
- Describe the environmental outcomes that will adequately protect flora and vegetation, through the containment of Dieback outside of the project area.
- Define how evidence will be collected to enable assessment of compliance with the criteria.

This Dieback Management Plan applies to all phases of the project, including construction, operation, closure and rehabilitation.

This Dieback Management Plan addresses the objectives of the 2014 Australian Government Department of the Environment, Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi*.

1.3 Key Environmental Factors

This EMP specifically addresses the Environmental Protection Authority (EPA) Environmental Factor of Dieback on Flora and Vegetation. The potential impact on flora and vegetation at the Munglinup Graphite Project through the spread of dieback is:

> *Loss of condition or death of native vegetation and impacts to Priority flora due to the introduction and/or spread of Phytophthora cinnamomi (dieback).*

Other aspects of flora and vegetation management are covered in the Munglinup Graphite Flora and Vegetation Management Plan.

1.3.1 Proposed Activities

The Activities that have the potential to affect the flora and vegetation due to Dieback occurrences include:

- Machinery movement during construction including topsoil and waste rock stripping, movement and storage;
- Proposed access is via Clayhole Road and Farmers Road. Farmers Road is known to be infested by Phytophthora Dieback.
- Run-off of water from the surface of internal roads into uninfested areas;
- Movement of vehicles off-road or on undefined tracks, outside of mining areas (e.g. for sampling purposes); and
- Visitors to the Project bringing in dieback-infested soil and/or plant material e.g. on tyres/ vehicles or footwear.

1.3.2 Site Specific Environmental value

The environmental values potentially impacted by the proposed operation are listed in Table 3.

Table 3 Key Environmental Factors, Activities and Values

Environmental Value	Potential Impacts
Flora and Vegetation	Loss of condition or death of native vegetation and impacts to TEC and Priority flora due to the introduction and/or spread of *Phytophthora cinnamomi* (dieback) via: • Machinery movement during construction including topsoil and waste rock stripping, movement and storage; • Run-off of water from the surface of internal roads into uninfested areas; • Movement of vehicles off-road or on undefined tracks, outside of mining areas (e.g. for sampling purposes); and • Visitors to the Project bringing in dieback-infested soil and/or plant material e.g. on tyres/ vehicles or footwear.

1.4 Conditional Requirements

No conditions currently exist for the Project. This management plan is being submitted to support the environmental assessment currently underway under s38 of the *Environmental Protection Act 1986* and Part 9 of the *Environmental Protection and Biodiversity Conservation Act 1999.* MRC has taken into consideration the environmental objectives set for *Dieback* and are committed to implementing the Project in a manner that meets these objectives.

1.5 Rationale and Approach

Results of baseline surveys and a number of assumptions and uncertainties inform the management approach for meeting the environmental objectives of this EMP. The identified management actions, management targets, monitoring and reporting objectives are aligned with the overall management approach.

1.5.1 Survey and Study Findings

In WA, dieback is a significant environmental issue for areas ranging between Geraldton in the Midwest and Esperance on the South Coast. Dieback is particularly common in the south west of Western Australia. The eastern most extent of the disease is recorded past Esperance and has been recorded in the Ravensthorpe area.

Dieback is often spread and persistent during consistent favourable temperature conditions (15 – 30 °C) and moisture conditions (>80% ambient soil moisture under aerobic conditions). The disease naturally spreads freely in water, through the soil (root to root contact) or through the transport of soil on vehicles and footwear etc.

Dieback assessments of the Project Area were undertaken in 2018 and 2019 (Table 4). The vegetation assessment types that were followed for both surveys conducted at the Project were:

Infested – Areas a registered interpreter determines to have plant disease symptoms consistent with the presence of *Phytophthora cinnamomi*.

Uninfested – Areas determined by a registered interpreter to be free of plant disease symptoms that indicate the presence of *P. cinnamomi*.

Uninterpretable – Natural, undisturbed areas where susceptible plants are absent, or are too few to make a determination of the presence or absence of *P. cinnamomi*.

Temporarily uninterpretable – Areas where disease presence or absence cannot be determined due to a level and type of site disturbance that will recover within the short to medium term, e.g. fire, rehabilitation.

Not yet resolved – Phytophthora occurrence diagnosis cannot be made because of inconsistent or incomplete evidence (including sample results). The category is only to be used in low interpretability zones (400mm to 600mm rainfall range).

Two field assessments have been conducted to identify the dieback assessment types across the entire project area. These assessments were conducted between 2018 and 2019 and are detailed in Table 4

Table 4 Completed baseline studies for the Munglinup Graphite Project

Survey or study	Year	Key Survey or Study Findings
Glevan Consulting. Munglinup – Phytophthora Dieback Assessment	2018	No Phytophthora Dieback infestations were observed within the project area. The majority (228 ha) of the study area, was observed to be uninterpretable due to the presence of vegetation types containing an insufficient coverage of reliable indicator species. While the majority of the study area is uninterpretable, the absence of susceptible vegetation types coinciding with water-gaining sites, means there is a low likelihood of the disease being present, and that the entire uninterpretable area is most likely uninfested. In fact, it is also highly probable that Tenement M74/245 is uninfested in its entirety.
Great Southern Bio Logic. Phytophthora Dieback Occurrence Survey.	2019	No Phytophthora Dieback disease expression was observed within the mining reserve R24714 however occurrences with observed along Farmer Road. Uninfested vegetation was identified during linear surveys along the northern and eastern firebreaks in the areas previously assessed as the proteaceous dominant Kwongkan Shrubland (VU 16 and VU17). Based on the findings of the linear survey, all areas of previously assessed Kwongkan TEC within the Study Area were classified as uninfested and protectable. All other vegetation units (VU) were assessed as uninterpretable. This includes the areas associated with the linear survey of tracks within the proposed development area.

1.5.1.1 Climate

The Project is located on the South Coast in the Goldfields-Esperance Development region of Western Australia. The climate of this region is temperate Mediterranean with warm summers and mild to cool winters.

Temperatures and rainfall data were retrieved from the Bureau of Meteorology (BoM) weather recording station at Munglinup West (station number 012044) from 2002 to 2020. The mean annual monthly temperature maximum recorded at the station is 23.3°C and minimum is 10.6°C. On average the warmest month of the year is January with a mean maximum temperature of 29°C. July is the coolest month with a mean minimum temperature of 6.6°C. The mean annual rainfall is 450.8mm, with the lowest average monthly rainfall being 26.8mm in December, and the highest average monthly rainfall being 47.2mm in August (BoM, 2020). Figure 3 presents the typical climate information associated with the Munglinup West weather station. Average dam evaporation exceeds average rainfall in all months of the year by a factor of three (Luke, Burke, & O'Brien, 1988).

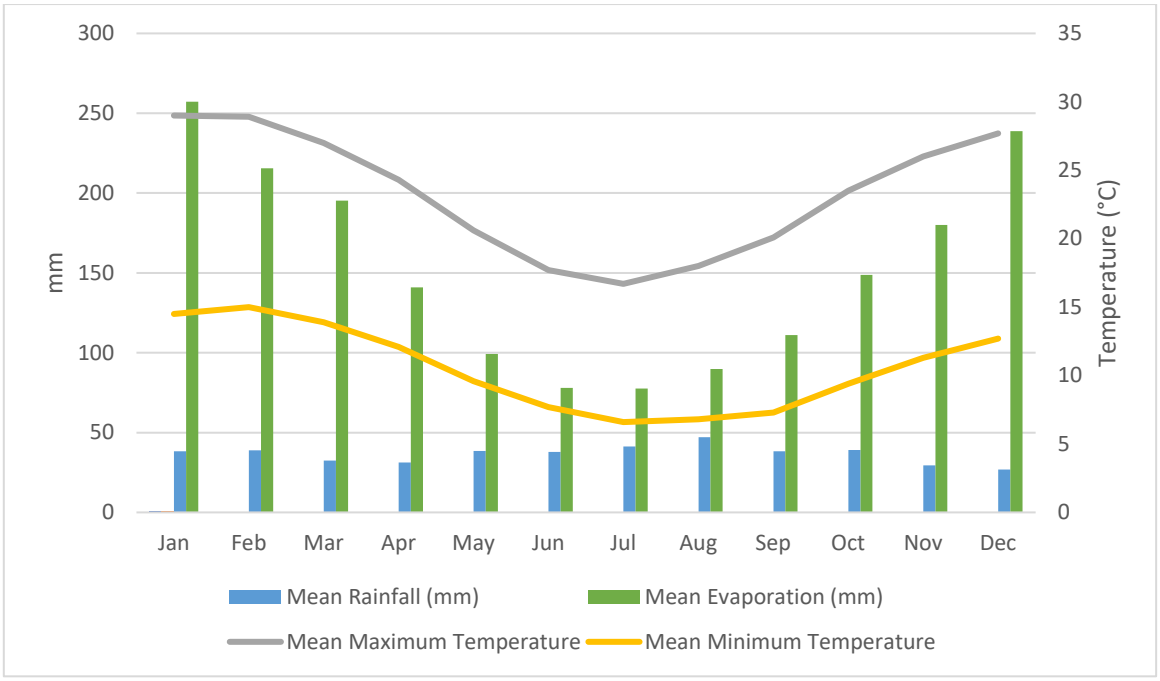


Figure 3 Mean Temperature and Rainfall Recorded at Munglinup West from 2002 to 2020 (BoM, 2020)

1.5.2 Key Assumptions and Uncertainties

The following key assumptions underlies this plan:

- While dieback occurrence data is only valid for a 12 month period from the date of assessment, the finding from the Glevan report are still appropriate to be used for this management plan guidance as the findings of the survey was they study area was uninterpretable due to insufficient indicator species.

The assumption is also the uncertainty whereby:

- Should the project be approved, a confirmatory survey will be required prior to the commencement of any substantial earthmoving operations.

1.5.3 Management Approach

The management provisions set out in this document are based on a risk-based management approach. This management plan is developed around the mitigation hierarchy of avoid, minimise and rehabilitate to ensure that impacts to the key environmental factors are avoided or reduced to as low as reasonably practicable. Mitigation and management actions have been identified and prioritised using the information gathered from the baseline surveys in Table 4 and other regional and local information within the public domain.

1.5.4 Rationale for Choice of Provisions

The management targets are based off of the identified potential impacts. The potential impacts is the death of native vegetation due to infestation and spread of *Phytophthora cinnamomi*. Management provisions are focused on prevention of dieback vectors crossing:

1. From dieback-infested areas to dieback-free or uninterpretable areas; or
2. From uninterpretable areas into dieback-free areas; and
3. Earth/soil material entering the Project area from outside of the project.

Appropriate management actions considers the three stages: construction, operations, closure and rehabilitation.

In addition to these three stages, this EMP identifies and describes the proposed monitoring and management actions to be undertaken and specifies contingency measures to be undertaken in the event that a dieback infestation occurs.

The Project area will be apportioned into the following management zones as shown in Figure 4:

- Infested;
- Uninfested;
- Uninterpretable;
- Temporarily uninterpretable; and
- Not yet resolved

Provisions have been chosen to mitigate the key identified potential impacts and reduce the risk that the specified outcomes for Flora and Vegetation will not be achieved.

Measurable, management targets were developed that would facilitate management of environmental performance. Provisions were then developed with the aim of achieving those targets. A necessary feature of each provision is that it aims to achieve a management target that can be monitored and reported against in a structured manner.

The management provisions will be applied to the entire Project and most aspects are manageable with the exception of outside of external environmental conditions e.g. rainfall, temperature. All mitigation strategies will be in place and will take effect prior to any works being undertaken.

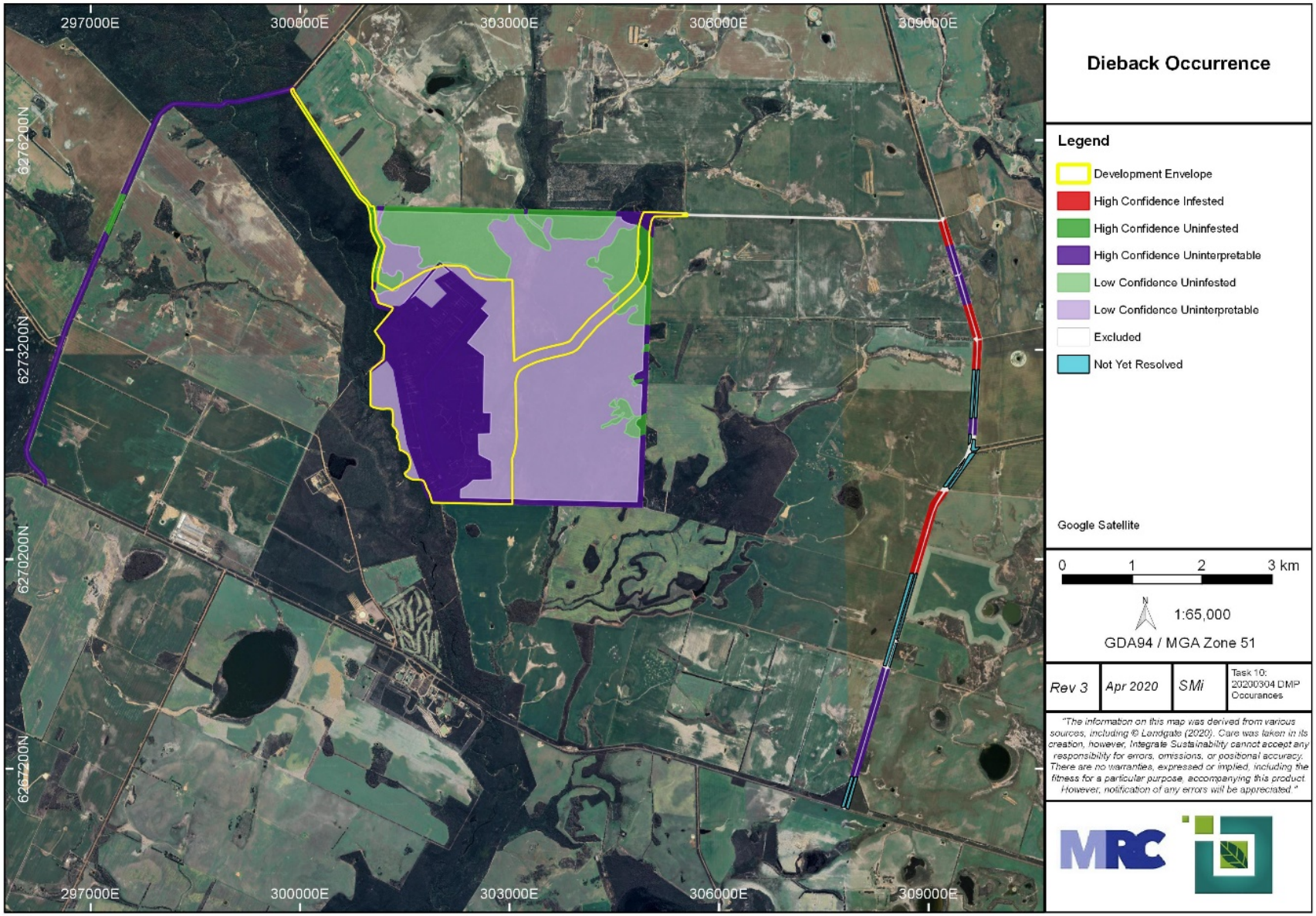


Figure 4 Dieback Occurrences

2. EMP Provisions

Details on the EMP provisions are provided in Table 6 as per the preferred approach outlined in the EPA Instructions for EMPs. The 'Schedule' approach has not been used as this EMP only covered one environmental factor, but can be adopted in future should it be required.

Table 5 EMP Values, Impacts and Outcomes

EPA factor and objectives:	Flora and Vegetation (dieback). To protect flora and vegetation so that the biological diversity and ecological integrity are maintained
Key environmental values:	• Priority Ecological Communities and Priority flora • Conservation significant fauna habitat • Carnaby's Cockatoo potential foraging vegetation
Key impacts and risks:	• Death of native vegetation due to infestation and spread of *P. cinnamomi* (dieback) or related species and subsequent changes in the dynamic of vegetation causing impacts to other species.
Outcome:	• The Project remains dieback-free.

Table 6 Management Based EMP Provisions

Management actions	Management targets	Monitoring	Reporting
Studies and monitoring • Monitoring the edge of the whole cleared boundary across the site on a three-yearly basis by a qualified, registered dieback interpreter. • Annual (and opportunistic) vegetation health monitoring of the Kwongkan Shrubland TEC will be implemented. Monitoring will be undertaken using photo monitoring. • Compliance of hygiene procedures will be periodically audited.	No dieback being introduced into the Project No dieback spread throughout the Project	Dieback survey reports and monitoring reports/record keeping	Annual Environmental Reports (DMIRS) Compliance Annual Report (DWER) Internal record keeping and reporting Laboratory analysis reports Survey/monitoring reports
Construction of Project in accordance with approved design • Wash down facilities will be in areas not conducive to dieback • Surface water travelling along the main access road will be diverted to avoid ponding that may facilitate the spread of dieback • Surface water will also avoid being drained into dieback-free areas and area susceptible to dieback • Any tracks not in use will be blocked to reduce unnecessary traffic through vegetated areas		Survey data and aerial imagery	Annual Environmental Reports (DMIRS) Mine Rehabilitation Fund (DMIRS) Compliance Annual Report (DWER) Internal record keeping
Material use/movement • Contaminated or potentially materials will not be brought into the site. Outside materials will be assessed as being free of dieback by a suitably trained and competent consultant Borrow pits assessed to be dieback free prior to use • All topsoil, borrow material and subsoil from these zones will be stockpiled within the same dieback zone it was removed from	No dieback being introduced into the Project No dieback spread throughout the Project	Internal record keeping of external 'fill' material purchases and certification reports Vehicle inspection forms	Annual Environmental Reports (DMIRS) Compliance Annual Report (DWER) Internal record keeping

Management actions	Management targets	Monitoring	Reporting
• During clearing and construction, the boundaries of the different dieback zones will be clearly delineated to ensure vehicles do not inadvertently cross from one zone into another without vehicle cleaning • Water used for construction/operation will be from dieback free sources only		Log books maintained in vehicles to record wash down.	
Vehicle movement • All contractor vehicles will arrive at the site in a clean condition. • Environmental Officer to inspect vehicles prior to mobilisation • Construction only be undertaken during dry soil conditions and vehicles will be cleaned (dry brushing) and inspected prior to re-entering dieback free zone areas • Maintenance and grading roads may occur under damp conditions, but not wet and boundaries of dieback zones are not be crossed without cleaning • Where machinery is required to be moved between sites, they will be washed down and inspected for soil and vegetative material prior to commissioning. • Light vehicles exiting the main mine site area onto monitoring tracks will be washed down prior to leaving the main mine site area.			
Ground Disturbance Permit (GDP) • GDP process includes dieback assessment by approving Environmental Officer • Environmental Officer to monitor clearing in any dieback areas • Guidance, zone maps and strategies provided within GDP process		Internal GDP register	Annual Environmental Reports (DMIRS) Mining Rehabilitation Fund (DMIRS) Internal record keeping
Vehicle hygiene and washbay use • Cleaning of all vehicles and machinery will be undertaken as per washdown procedures • Water from wash down bays will be directed into a sump for sediment separation and oily water separator before being directed into a dam for use in processing. • The use of phytoclean® (or similar) will be used for the wash down facilities and wheel baths to kill Phytophthora	No dieback being introduced into the Project No dieback spread throughout the Project	Regular documented maintenance of washdown bay Internal audits and inspections	Annual Environmental Reports (DWER/DMIRS) Annual Compliance Report (CAR) Internal record keeping
Contractor management and education • Inductions will include education about dieback and keeping to established tracks • Regular toolbox meetings about dieback management • All staff and contractors will be trained in all hygiene measures required at the site including vehicle and machinery clean-down specifications and educated on the regional important of preventing the spread of dieback		Internal induction register Vehicle inspections Log books	Annual Environmental Reports (DMIRS) Annual Compliance Report (CAR) Internal record keeping
Infrastructure maintenance • Sufficient freeboard maintained on all culverts and surface water management structures. • All culverts will be regularly maintained to ensure that water flow does not encroach onto road surfaces. • All sumps will be cleared of sediment at the end of summer after drying out.		Regular inspections of surface water management structures, particularly during and following periods of rainfall.	

Management actions	Management targets	Monitoring	Reporting
Signage • The boundaries of the different dieback zones will be clearly delineated. • Signage will notify all personnel they are entering a dieback-free zone, in order to promote best-practice activities whilst within the zone. • Any suspected occurrence of dieback will be clearly demarcated in the field, signs erected, and barriers installed to prevent vehicle access. The locations of any infestation will be recorded, and the details made accessible to mine and environmental staff.		Internal audits and inspections.	Internal record keeping
Rehabilitation • Topsoil will be returned to the dieback zone it was removed from. Topsoil from the dieback free zones may be used anywhere. • Prior to closure, it will be determined which roads may be required for monitoring and contingency purposes. These will be rehabilitated last to prevent vehicles going off-road. • All final landform designs will include drainage that prevents runoff draining into dieback-free zones from dieback susceptible zones, where possible	No dieback spread throughout the Project	Internal audits and inspections.	Internal record keeping and reporting. Annual government reporting. Mine Closure Plan.

3. Adaptive management and review of the EMP

Given the potential for the introduction and spread of dieback, the management approach will remain adaptive. The following approach will be adopted:

- After a 12-18 month period, a disease re-check is required to be undertaken in accordance with DBCA guidelines (DBCA, 2015; DBCA, 2017)
- After a three year period a full re-assessment of the survey area will be required in accordance with DBCA guidelines (DBCA, 2017; DBCA, 2015).

The Dieback Management Plan will be reviewed and revised under the following conditions:

- If monitoring results indicate that management targets are not being achieved;
- If new information is discovered during construction, operations or closure;
- Where any significant changes to project design or operation have occurred; and
- Where it has been longer than 12 months since the last revision.

References

BoM. (2020). *Climate statistics for Australian locations*. Retrieved from http://www.bom.gov.au/climate/averages/tables/cw_012044.shtml

DBCA. (2015). *Phytophthora Dieback interpreters Manual for lands managed by the department.* Perth: Department of Biodiversity Conservation and Attractions.

DBCA. (2017). *Phytophthora Dieback Management Manual,.* Perth: Department of Biodiversity Conservation and Attractions.

EPA. (2020). *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans.* Environmental Protection Authority.

GSBL. (2020). *Phytophthora Dieback Occurrences Survey.* MRC Graphite.

KCB. (2018). *Tailings Geochemistry Memo Report, prepared for MRC Graphite.* Klohn Crippen Berger.

Luke, G. J., Burke, K. L., & O'Brien, T. M. (1988). *Evaporation Data for Western Australia. Technical Report No. 65.* Perth, WA: Western Australia Department of Agriculture.

Woodman Environmental . (2020). *Flora and Vegetation Assessment .* MRC Graphite.