GREAT SOUTHERN
BIO LOGIC
environmental solutions

Bremer Bay Cross Runway Construction

Operational Hygiene Management Plan

Tel: 0400 113 093 • PO Box 5573, Albany, WA, 6332 • Email: info@gsbiologic.com.au • www.gsbiologic.com.au

Bremer Bay Cross Runway Construction

Operational Hygiene Management Plan

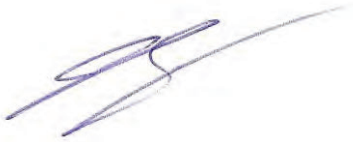
28 May 2024

Prepared for:

Shire of Jerramungup
8 Vasey Street
JERRAMUNGUP, 6337

Project reference: GSBL566-Bremer Airfield Cross Runway-OHMP-V3

Written and submitted by



Jeremy Spencer

Senior Environmental Scientist

Record of Distribution

No. of copies	Report File Name	Report Status	Date	Prepared for:	Initials
1	GSBL566-Bremer Airfield Cross Runway-OHMP	V3	28 May 2024	Shire of Jerramungup	JS
1	GSBL566-Bremer Airfield Cross Runway-OHMP	V3	28 May 2024	GSBL	JS

GREAT SOUTHERN BIO LOGIC

CONTENTS

1 INTRODUCTION 4

1.1 Background 4

1.2 Site Characteristics 4
1.2.1 Topography 5

2 REGULATION AND MANAGEMENT 6

2.1 Legislative Framework 6

2.2 Current Western Australian Management 6

3 DISEASE RISK ASSESSMENT 7

3.1 Disease Risk Assessment 7
3.1.1 Soil Moisture 7
3.1.2 Activity Type 8
3.1.3 Consequence of introducing Phytophthora Dieback 8
3.1.4 Calculation of Activity Risk 9

3.2 Basic Operational Hygiene Management 10

4 OPERATIONAL HYGIENE MANAGEMENT PLAN 12

4.1 Objectives of the OHMP 12

4.2 Cross Runway Construction – Definitions and Standards 12
4.2.1 Bremer Bay Airfield Site Access 12
4.2.2 Soil moisture 12
4.2.3 Staged works across disease categories 13
4.2.4 Clean on Entry – Protectable Areas 13
4.2.5 Clean on Entry Locations 13
4.2.6 Drainage 14
4.2.7 Basic Raw Materials 14
4.2.8 Green Bridging 14
4.2.9 Phytophthora Dieback Signage 15
4.2.10 Dieback Protection Area Signs 15
4.2.11 Dieback Status Markers 15

5 OPERATIONAL HYGIENE STRATEGIES 17

6 REFERENCES 25

7 DISCLAIMER 26

LIST OF ATTACHMENTS

Figures

Figure 1: Bremer Bay Cross Runway Regional Location

Figure 2: Bremer Bay Cross Runway Phytophthora Dieback Occurrence showing Sample Locations, signage and Clean on Entry points

Appendices

Appendix A: Example hygiene inspection checklist and record

Appendix B: Green Bridging – Excerpt from PDMM defining Green Bridge Construction

1 INTRODUCTION

1.1 Background

The Shire of Jerramungup is planning the development and construction of a second runway for its airfield located on Don Ende Drive in the Town of Bremer Bay. This proposed new runway is referred to as the cross runway and the proposed project footprint (the Survey Area) is shown in Figure 1.

The project has been assessed under the Environmental Protection and Biodiversity Conservation (EPBC) Act 1999 and formal approval is conditional on development of management strategies that will mitigate any introduction or spread of Phytophthora Dieback or invasive weed species during works. This Operational Hygiene Management Plan (OHMP) is designed to mitigate those risks and satisfy the regulatory conditions.

Phytophthora Dieback is an introduced soil borne plant pathogen that affects up to 40% of native plant species within Western Australia, especially species from the Proteaceae family which are dominant within the Kwongkan Threatened Ecological Community found within and surrounding the Survey Area. Most commonly the disease is caused by the species *Phytophthora cinnamomi,* however, other species such as *P. multivora* can also have significant impact under specific environmental conditions. Phytophthora Dieback is commonly introduced to an area through infested soils carried as basic raw materials or as dirt on vehicles, plant and machinery. In favourable conditions the pathogen can result in the collapse of entire vegetation communities. Once introduced to an area, Phytophthora Dieback will spread through further human vectoring and also via water movement and root to root contact, resulting in extensive infestations which may cause significant impact to native vegetation communities. There is currently no practical method of eradication of the pathogen.

Invasive weeds of concern to the project have been listed by DAWE (EPBC ref 2019/8434) as including Victorian tea-tree (*Leptospermum laevigatum*), Sydney golden wattle (*Acacia longifolia*), Taylorina (*Psoralea pinnata*) Blackberry (*Rubus fruticosus aggregate*), Boxthorn (*Lycium ferocissimum*) and Bridle Creeper (*Asparagus asparagoides*).

Development of this OHMP was based on the results of the Comprehensive Phytophthora Dieback assessment and a site assessment for the occurrence of listed weed species, both performed in December 2023 (GSBL 2024). It incorporates relevant information from the DBCA guideline, *Phytophthora Dieback Management Manual* (DBCA 2020) where appropriate and allows for applications of hygiene management principles to control weeds as well as Phytophthora Dieback. The OHMP is to be implemented during construction and ongoing maintenance works and is applicable across the entire area that was subject to the Phytophthora Dieback and Invasive weed surveys.

1.2 Site Characteristics

The Bremer Bay Airfield is situated approximately 4 km to the north east of the Bremer Bay townsite on the south coast of Western Australia. The airfield is within the Shire of Jerramungup Reserve 24521 and accessed from the south along Don Ende Drive. The proposed cross runway is to be aligned from the south east to the north west, crossing the existing runway. The total project area, shown in Figure 1 and identified as the Study Area, is approximately 75.1 ha and is currently predominantly vegetated, with the exception of the intersection with the existing runway and perimeter fence alignments.

The existing site facilities are fenced to exclude uncontrolled access, however, the proposed cross runway alignment is currently unfenced. On site facilities include an aircraft hanger, water storage and refuelling pad for aerial water bomber support, runway lighting and minor site buildings. To the south and west of Reserve 24521 there is privately owned, cleared agricultural land and to the north and east is the Fitzgerald River National Park (FRNP), managed by the Department of Biodiversity Conservation and Attractions (DBCA). The cross runway Survey Area immediately adjoins remnant native vegetation within Reserve 24521 on all sides, with the exception of a very small area at the eastern end of the Survey Area where Done Ende Drive enters the airfield. At this point the FRNP directly adjoins the Survey Area.

The Survey Area is gently undulating and situated on an elevated ridgeline that drains to all sides. Notably, drainage form the northern section of the proposed cross runway drains north and west into a major creek system that flows into the Wellstead Estuary. This creek system forms the southern boundary of the FRNP and is approximately 500 m from the Survey Area.

1.2.1 Topography

The Bremer Bay Airfield is approximately 4 km west of the Bremer Bay townsite and adjoins the southern boundary of the FRNP. It is situated on elevated ground that is described as gently undulating. The proposed new runway alignment includes a local high point to the north west.

There is a major tributary of the Wellstead Estuary to the north of the airfield, situated within the FRNP, and a minor tributary to the Wellstead Estuary to the south of the airfield. This results in all drainage from the airfield eventually entering the estuary. The topography to the north of the airfield and proposed new runway becomes moderately steep due to the influence of the major tributary.

2 REGULATION AND MANAGEMENT

2.1 Legislative Framework

The Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) lists Phytophthora Dieback as a key threatening process that poses a significant threat to biodiversity values within Australia. The EPBC Act also lists several species of Invasive Weeds that pose threat to native vegetation and associated ecosystems that listed as endangered under the EPBC Act.

Policy prepared under the EPBC Act includes the national *Threat Abatement Plan for disease in natural ecosystems caused by Phytophthora cinnamomi* (TAP) (Commonwealth of Australia (CoA) 2018), and recovery plans for threatened flora species and threatened ecological communities that include Dieback management considerations.

The TAP (CoA 2018) establishes a national framework to guide and coordinate Australia's response to Phytophthora Dieback. This identifies research, management and other actions to mitigate impact of the pathogen to natural values.

In Western Australia, Phytophthora Dieback management is regulated by the Department of Biodiversity Conservation and Attractions (DBCA) through implementation of the *Biodiversity Conservation Act* (2016) and the *Conservation and Land Management Act* (1984). The DBCA also has certain statutory obligations under the *Biosecurity and Agriculture Management Act* (2007) (BAM Act) concerning biosecurity matters generally, including *Phytophthora*. The BAM Act is administered by the Department of Primary Industries and Regional Development (DPIRD).

2.2 Current Western Australian Management

In Western Australia, assessment and management of Phytophthora Dieback is overseen by the DBCA who regulate standards, implementation of hygiene and maintain a registration system for appropriately qualified Phytophthora Dieback Interpreters. The DBCA's primary tools for the management of Phytophthora Dieback in WA include the *Phytophthora Dieback Interpreters Manual for lands managed by the Department* (DBCA 2015) and the *Phytophthora Dieback Management Manual* (DBCA 2020).

The Dieback Working Group also contributes to Phytophthora Dieback management in Western Australia through the development and distribution of management guidelines for community and industry groups. *Standard Dieback Signage - protocols for use* (Project Dieback, 2008) guides standardised signage across tenures to raise awareness and mitigate disease spread.

The management of weeds is defined by DPIRD as a shared responsibility between landholders, grower groups, biosecurity groups and the Department. DPIRD identify weeds as Weed species including invasive weeds listed under the EPBC Act that are listed as pest plants, Declared Plants, crop weeds or Weeds of National Significance. All pests listed under the BAM Act are listed on the WA Organisms List and many are also listed under the EPBC Act.

3 DISEASE RISK ASSESSMENT

All activities that may be required during the course of the construction program will need to be subject to a risk assessment to determine the appropriate level of hygiene required to maintain the status of Protectable vegetation across the Bremer Bay Airfield. The risk assessment process defined in this OHMP will determine the relevant level of hygienic management practices that are required.

As defined in the *Phytophthora Dieback Management Manual* (PDMM) (DBCA 2020), low risk activities may proceed with the application of Basic Operational Hygiene Management practices, without direction of a formal hygiene plan. Low risk activities are activities that are considered unlikely to introduce or spread potentially infested soil or plant material. Basic Operational Hygiene Management practices as presented in Section 3.2 below, are the lowest level of required hygiene and must be applied during all activities performed across the Bremer Bay Airfield. These practices require all vehicles, machinery, equipment, and clothing including footwear to be clean from soil and plant matter before gaining access to the airfield or any area of Protectable vegetation within the airfield reserve (GSBL 2024).

As defined in the PDMM (DBCA 2020) any soil disturbance activity with a moderate to high risk of introducing Phytophthora Dieback into an area must be performed in accordance with an activity specific OHMP. The specific operational hygiene strategies for various stages of construction works are presented in Section 4 of this OHMP.

3.1 Disease Risk Assessment

The primary source of Phytophthora Dieback introduction and spread is through controllable or uncontrollable disease vectors. Controllable vectors include human movement of contaminated soil, water and vegetation carried on vehicles, machinery equipment and clothing, including footwear and importation of contaminated soils as basic raw materials. Uncontrollable disease vectors include movement of infested soil or plant material on animals and autonomous spread.

The risk of introducing Phytophthora Dieback is closely related to the soil moisture content at the time of the proposed activity, the nature of the activity and the consequence of introducing the disease on vegetation occurring in the area the activity is planned. These are further defined below.

3.1.1 Soil Moisture

As Phytophthora Dieback spreads most readily in infested soil transported on vehicles, machinery, equipment and footwear, higher levels of soil moisture will increase the risk of disease spread as it increases the soil's capacity to adhere to these carriers. Soil moisture classifications are defined in the PDMM and provide general soil characteristics associated with various soil moisture levels that are not site specific. Soil moisture classifications defined in the PDMM are:

- **Dry** – where dust forms when exposed soil is disturbed.
- **Moist** – where soil is damp but does not readily stick to carriers.
- **Wet** – where soil and moisture combine so that soil sticks to carriers.

It is important to note that the amount of rainfall required to influence the classification of soil moisture varies with soil type and therefore must be regularly monitored throughout an activity. Soils across the Bremer Bay Airfield consist of silty sands with some areas of surface clays. These soils will readily

adhere to carriers with moisture and therefore soils across the Survey Area may become wet, as defined in the PDMM soil classifications, following only low levels of rainfall.

3.1.2 Activity Type

The PDMM provides examples of various soil disturbance activities and considers activity factors and the associated likelihood of introducing Phytophthora Dieback as a result of the example activities. Likelihood considerations include:

- The type of vehicles/machinery to be used (track or rubber tyres)
- the number of vehicles, machines and equipment
- the size of the area involved
- importation of basic raw materials (gravel, sand etc.) and
- the duration of the activity.

The likelihood of introducing or spreading Phytophthora Dieback is scaled between *Very Likely* and *Very Unlikely*.

With application of Basic Phytophthora Dieback Management principles, as defined in Section 3.2, specifically Clean on Entry across the survey area, the likelihood of construction activities, including vegetation clearing, introducing Phytophthora Dieback is classified in the PDMM as ***Possible***.

3.1.3 Consequence of introducing Phytophthora Dieback

The consequence of introducing Phytophthora Dieback is based on the predicted impact of the pathogen in a specific vegetation type. This will vary with vegetation type, position in the landscape, annual rainfall and soil types. Table 1 below presents the predicted impact ratings and associated consequence ratings as defined in the PDMM.

Table 1: Predicted impact rating, assessment scale and associated consequence rating

Assessment for the consequence of introducing Phytophthora Dieback		
Predicted Impact	Scale of Impact	Consequence Rating
Very High	> 50% overstorey will die	**Severe**
High	10% to 50% of overstorey will die	**Significant**
Moderate	< 10% of overstorey and high numbers of understorey will die	**Moderate**
Low	No overstorey and minimal understorey will die	**Minor**

As described in the Bremer Bay Cross Runway Construction – Environmental Surveys report (GSBL 2024), the vegetation across the Survey Area is highly susceptible and observed disease impact was consistent with the definition of Moderate impact in Table 1 above. This is however only because the currently impacted vegetation is within an area of Malee Heath that does not have a clearly defined overstory. Very High impact can be predicted if the disease enters vegetation communities with vegetation structure including an overstorey. Nearby vegetation with an overstorey of *Banksia attenuata*

is situated within the proximity of the infested vegetation and will be influenced by proposed works, therefore the Predicted Impact is Very High and the associated Consequence rating is **Severe**.

3.1.4 Calculation of Activity Risk

Tables 2 – 4 are adapted from the PDMM (DBCA 2020) and provide a risk assessment matrix based on activity likelihood of introducing the pathogen and the consequence of introducing the pathogen for each soil moisture classification. If an activity is anticipated to occur over a range of soil moisture conditions then the worst case scenario must be applied.

Any activity that is considered to have a Moderate or High Risk rating is required to be subject to an activity specific operational plan that considers current Phytophthora Dieback occurrence data developed through operational scale disease survey methods (DBCA 2015).

Low risk activities can proceed with the application of basic Phytophthora Dieback management principles which are defined in Section 3.2.

Table 2: risk matrix for activities performed in Dry Soil Conditions

Phytophthora Dieback Risk Assessment for Activities in Dry Soil				
Likelihood	**Consequence**			
	Minor	Moderate	Significant	**Severe**
Very Likely	Moderate	High	High	High
Likely	Moderate	Moderate	High	High
Possible	Low	Moderate	Moderate	**High**
Unlikely	Low	Low	Moderate	Moderate
Very Unlikely	Low	Low	Low	Low

Table 3: risk matrix for activities performed in Moist Soil Conditions

Phytophthora Dieback Risk Assessment for Activities in Moist Soil				
Likelihood	**Consequence**			
	Minor	Moderate	Significant	**Severe**
Very Likely	High	High	High	High
Likely	Moderate	High	High	High
Possible	Moderate	Moderate	High	**High**
Unlikely	Low	Low	Moderate	High
Very Unlikely	Low	Low	Moderate	Moderate

Table 4: risk matrix for activities performed in Wet Soil Conditions

Phytophthora Dieback Risk Assessment for Activities in Wet Soil				
Likelihood	**Consequence**			
	Minor	Moderate	Significant	**Severe**
Very Likely	High	High	High	High
Likely	High	High	High	High
Possible	Moderate	High	High	**High**
Unlikely	Moderate	Moderate	High	High
Very Unlikely	Low	Low	Moderate	Moderate

NB: from Section 3.3.3, consequence rating for the Shire of Jerramungup Project Area is **Severe**.

Applying the soil moisture measure, likelihood and consequence information to Tables 2 – 4 results in a High risk rating for all soil conditions.

3.2 Basic Operational Hygiene Management

Basic Operational Hygiene management practices are suitable for application during general site access and other low risk activities that do not involve soil or plant movement. Basic Operational Hygiene management must be applied during all activities and requires the standard of clean on entry (CoE) be applied across the Bremer Bay Airfield. CoE is defined as the requirement for all vehicles, equipment, machinery and clothing including footwear to be clean and free from all soil and plant material prior to entering protectable areas of vegetation and areas free from invasive weeds. Basic Operational Hygiene management practices include:

- an assumption that all vegetation is protectable and invasive weeds are absent from the site. To minimise the risk of disease spread, all work should be scheduled during dry soil conditions where practicable (see definition Section 3.3.1).
- all personnel and site contractors to have completed biosecurity awareness training and be familiar with the requirement for operational hygiene to be assessed and applied with all disturbance activities within the airfield. Basic Green Card training is a suitable standard of awareness training. A list of suitable Green Card training providers is available through the Dieback Working Group website. Contractors without Green Card training who require short term access to site shall participate in a site induction that identifies biosecurity measures and will also be accompanied by a Shire of Jerramungup employee or contractor who has completed Green Card training.
- all vehicles, equipment, machinery and clothing including footwear are to arrive at the Bremer Bay Airfield in a hygienically clean state that is free from all soil and plant material.
- vehicles and machinery must not drive through areas where Phytophthora Dieback may persist, such as wet, low-lying areas, boggy creeks and puddles, and areas identified as Infested by the disease (Figure 2).

- mobile clean down kits, as defined below (Commonwealth of Australia 2015), are to be carried and used for minor, unplanned hygiene compliance needs.
- any observed breaches of hygiene must be reported to the Supervising Manager.
- a risk assessment (Section 3.4) must be performed prior to undertaking any activity other than general access, to determine the risk of introducing or spreading Phytophthora Dieback or invasive weeds during activity implementation.

To manage unforeseen situations that may result in a breach of hygiene, mobile clean down facilities to allow small scale clean down in the field must be available. Such situations may include emergency response, un-forecast rain or other unplanned events. As a minimum, a mobile clean down unit will include the following (Commonwealth of Australia 2015):

- rectangular plastic tub with a lid (to carry items and to use as a footbath)
- stiff brush
- newspaper to cover the foot well of vehicles (replace with clean newspaper regularly)
- dustpan and brush, possibly also a long-handled broom
- plastic bag for sweepings and dirty newspaper
- drum of water and sterilising solution, i.e., solution of 70% ethanol/methylated spirits in 30% water or 20% household bleach (with 5% active ingredient) in 80% water
- spray bottle containing sterilising solution (as above) and
- alcohol wipes or gel for hands and personal items.

All cleaning solutions will require appropriate labelling.

4 OPERATIONAL HYGIENE MANAGEMENT PLAN

This OHMP is required to ensure the risks of introduction and spread of Phytophthora Dieback and/or invasive weed species are effectively mitigated during the construction and maintenance of the proposed Bremer Bay Airfield cross runway. The plan closely follows the requirements of the PDMM (DBCA, 2020) which defines the requirements for disease management on lands managed by the DBCA. This document is considered the most appropriate guideline as it currently represents best practice in Western Australia and supports the objectives of the National TAP for Phytophthora Dieback. Further, as the Bremer Airfield directly adjoins the FRNP, managed by the DBCA, the PDMM is considered a suitable guideline for informing hygiene practices. As the main method of weed ingress into an area is also associated with the transportation of compromised soil and plant material, the hygiene measures required by the PDMM are also considered suitable for effective weed hygiene. The OHMP is informed by operational scale Phytophthora Dieback occurrence data and invasive weed occurrence data presented in *Bremer Bay Cross Runway Construction – Environmental Surveys 2024* (GSBL 2024).

4.1 Objectives of the OHMP

The objectives of this OHMP are to:

- mitigate the risk of Phytophthora Dieback introduction into Protectable areas
- mitigate the risk of spreading Phytophthora Dieback from existing infested areas and
- mitigate the risk of introducing invasive weed species into the Bremer Bay Airfield.

4.2 Cross Runway Construction – Definitions and Standards

4.2.1 Bremer Bay Airfield Site Access

Access to the Bremer Airfield is via Done Ende Drive in the south of the Survey Area (Figure 2). All vehicles, machinery equipment and workers' clothing including footwear must arrive at the Bremer Bay Airfield in a condition that is clean and free from soil and plant material. Hygiene inspections must be performed and recorded using a hygiene inspection form (Appendix A) at the site entrance prior to gaining access. Any vehicles, machinery equipment or workers' clothing including footwear, failing the hygiene inspection must be refused entry and sent for hygienic cleandown to be performed at a suitable clean down facility off site.

- A suitable clean down facility is defined as a designated area where clean down activities can be undertaken in a manner that allows soil and effluent to drain into a sump that is separated from vehicles and cannot drain to surrounding Protectable areas. It must be of sufficient size to allow for all vehicles, equipment and machinery that may need clean down.
- Construction contractors must identify the location of suitable clean down facilities prior to commencing works.

4.2.2 Soil moisture

The risk of undertaking construction works, including vegetation clearing, all construction activities and post construction maintenance, is High in all soil moisture categories. Despite this, risk of infested soil or plant material adhering to vehicles, machinery, equipment and clothing is reduced in Dry Soil conditions. Performing activities in Dry Soil will result in reduced hygienic clean down requirements. Specifically

clearing and construction in infested areas must be prioritised for Dry Soil conditions to ensure the risk of infested soils being picked up on machinery and equipment is minimised.

4.2.3 Staged works across disease categories

All vehicles, machinery and equipment are to arrive on site in a condition that is clean and free from soil and plant material. To minimise the requirement for onsite clean down, all work should, where possible, be staged so work is performed in uninfested, protectable areas first. Prior to gaining access to protectable areas, a hygiene inspection will be required including completion of a Hygiene inspection checklist form (Appendix A). Works associated with specific tasks must, where possible, be performed in infested areas after that task has been completed in protectable areas.

All vehicles, machinery, equipment and clothing including footwear that have been used in infested or excluded areas, must be subject to a hygiene inspection and clean down if required, prior to accessing protectable areas.

4.2.4 Clean on Entry – Protectable Areas

Protectable Areas, as shown on Figure 2, must only be accessed during dry soil conditions. If soil moisture is sufficient to result in soil adhering to vehicles and machinery while in transit, access must not be gained into Protectable Areas.

Before crossing any disease hygiene boundaries (Figure 2) and gaining access to Protectable Areas, all vehicles, machinery, equipment, clothing and footwear must be clean and free of all soil and plant material. A hygiene inspection to ensure soil and plant material is not moved into Protectable Areas must be performed prior to gaining access to each Protectable Area. Hygiene inspections must be recorded on a hygiene inspection check list (Appendix A). Any vehicles, machinery, equipment or footwear that fail the hygiene inspection must either:

- Undertake infield clean down at designated Clean on Entry (CoE) locations as defined below. Infield clean down is only suitable for removal of small amounts of loose soil and plant material from all vehicles, machinery, equipment and footwear. All infield clean down must be performed so that effluent drains away from adjoining Protectable Areas and all soil and plant material cleaned off vehicles, machinery, equipment and footwear must be collected so it cannot be subsequently picked up and carried across Protectable Area boundaries or
- If mobile clean down kits, as defined in Section 3.2, are inadequate for infield clean down, the vehicle, machine or equipment must attend a suitable off site clean down facility as defined below, and perform a full hygienic clean down to remove all soil and plant material.
    - A suitable clean down facility is defined as a designated area where clean down activities can be undertaken in a manner that allows soil and effluent to drain into a sump that is separated from vehicles and cannot drain to surrounding Protectable areas. It should be of sufficient size to allow for all vehicles, equipment and machinery that may need clean down.

4.2.5 Clean on Entry Locations

There are currently seven CoE locations within the OHMP Survey Area, as shown on Figure 2. It is anticipated that this number may increase as additional site infrastructure is constructed.

All vehicles, machinery, equipment and footwear are to be inspected at the CoE location at the entry to the Bremer Bay Airfield from Don Ende Drive.

In addition to the main access point on Don Ende Drive there are six entry points into Protectable Areas shown on Figure 2 and all are CoE locations. Further, any entry point from cleared ground that has been excluded from Phytophthora Dieback assessment, or from infested areas into any Uninfested or Uninterpretable Protectable areas must also be considered as a CoE point. Clearing and construction contractors must identify these additional CoE locations prior to commencing work.

Additional CoE points will be required where newly constructed infrastructure, including airfield fencing and firebreaks, traverse infested soils. These CoE locations will need to be identified and located following construction.

Hygiene inspections must be performed within the Unprotectable or Infested vegetation, approximately 15 m from the disease status marker (see Section 4.2.11).

If infield clean down is required, the item to be cleaned must be positioned so that so that effluent drains away from adjoining Protectable Areas and all soil and plant material cleaned off the item must be collected and removed from the airfield so that it cannot be subsequently picked up and carried across Protectable Area boundaries.

4.2.6 Drainage

All engineered drainage associated with the new cross runway must be designed and maintained so that drainage from infested areas, including drainage that flows from protectable vegetation but passes through infested areas, is directed to unprotectable vegetation. The proposed drainage plan is shown on Figure 2.

4.2.7 Basic Raw Materials

Basic Raw Materials (BRM) are defined as any soils, gravels, sand or other raw material used during the project. BRM represent the greatest risk of introducing Phytophthora Dieback or weeds into the project area.

Any sources of BRM must be assessed as a low risk source by a suitably qualified person or through demonstration of appropriate certification.

Materials used for rehabilitation including mulches, soils and plant stock must be sourced from a Nursery Industry Accreditation Scheme Australia (NIASA) accredited nursery and must have be certified as being free from pests and diseases.

There is no process for certifying the disease-free status of gravels and sands so these materials cannot be verified as disease free. Such materials must be sourced from a pit situated in elevated areas of the landscape, away from high-risk disease vectors. They must be assessed as low risk of being infested by Phytophthora Dieback by a registered disease interpreter.

4.2.8 Green Bridging

Following vegetation clearing, and removal of topsoil from the infested area, low risk BRM is to be used to create a sub-base for the cross runway. This can be constructed so that it forms a green bridge across the infested area, separating all traffic from the infested soils, removing the risk of construction and maintenance vehicles and machinery transporting infested soils into the Protectable vegetation.

Information on the construction of Green Bridges is included in the PDMM and has been provided in this OHMP in Appendix B.

4.2.9 Phytophthora Dieback Signage

The Standard Dieback Signage Protocol (Project Dieback 2009) presents standardised Phytophthora Dieback awareness signage across tenure. Signage consistent with this standard will communicate disease status and the requirement for hygiene application across the Shire of Jerramungup Project Area site.

4.2.10 Dieback Protection Area Signs

Dieback Protection Area Signs identify the area as a site that is subject to management requirements that are informed by disease occurrence mapping. The signs are designed to be placed at main entry points and inform persons accessing the survey area that Phytophthora Dieback management practices are in place and are required to be followed. Dieback Protection Area signage has not been installed but is recommended.

Plate 1: Dieback Protection Area Sign showing Dieback status symbols used in the area

4.2.11 Dieback Status Markers

Dieback Status Markers are placed on roads and tracks entering or traversing disease category boundaries to notify road and track users of disease status associated with different areas. Each status marker is placed on a disease category boundary so that a person travelling along the road or track will see the status marker that indicates the disease hygiene category they are entering. When entering a disease category from another category (e.g., crossing from Uninfested into Infested) the sign post must have status markers on both sides to indicate both categories. When entering vegetation from unknown disease status areas, the sign post should only have a status marker on one side. Dieback Status markers have been installed in the Survey Area, however, it is noted that further markers may be required following development of the construction planning documents.

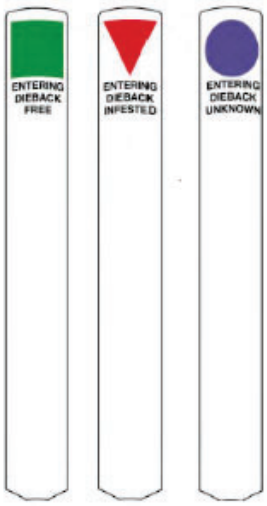


Plate 2: Dieback Status Markers

5 OPERATIONAL HYGIENE STRATEGIES

Activity	Risk	Mitigation Strategy	Timing
Project Planning			
Site reconnaissance	Introduction of infested materials on field vehicles and/or footwear	Ensure all field vehicles undergo effective clean down inspections at all *Clean on Entry* locations across the site and are clean and free from soil and vegetative material before accessing the site.	Site visit preparation
		All vehicles must travel to site via sealed roads or by well-formed gravel roads during dry soil conditions only. This will reduce the need for onsite hygiene clean down.	Site visit preparation
		Footwear is to be maintained in a condition that is clean and free from soil and vegetative material before accessing the site.	Site visit preparation
Phytophthora Dieback and weed occurrence information	Expired disease and weed occurrence data may not account for recent disease and weed incursions since the date of survey	Check that Phytophthora Dieback and weed occurrence information is current. Due to mobility of the disease, Phytophthora Dieback occurrence data is only valid for 12 months before a re-check of disease boundaries is required. There is no set timeframe for validity of weed data however a similar timeframe for re-check would be suitable.	Project planning

Activity	Risk	Mitigation Strategy	Timing
Plan to isolate works in '*excluded*' areas from construction works performed in *protectable areas*.	Areas of existing infrastructure that have been classified as '*excluded from survey*' may contain infested soils that cannot be detected and may be spread to uninfested areas.	Develop a construction plan that allows vegetation clearing and earthworks in areas of existing infrastructure to be completed separately to vegetation clearing and earthworks in *protectable areas*. Construction plan to allow for access to protectable areas via formalised *Clean on Entry* locations only	Planning - Develop plan to be implemented during construction.
Plan to isolate works in '*infested*' areas from construction works performed in all other areas.	Areas of vegetation that have been classified as '*infested*' contain infested soils that may be spread to uninfested areas.	Develop a construction plan that allows vegetation clearing and earthworks in infested vegetation to be completed separately to vegetation clearing and earthworks in all other areas. Construction plan to allow for access to protectable areas via formalised *Clean on Entry* locations only	Planning - Develop plan to be implemented during construction.
New runway drainage design.	Drainage from the new runway represents a potential source of inoculum into the protectable vegetation downslope, including the FRNP.	Drainage from the new runway road must be designed so that runoff from the runway does not flow into the protectable vegetation situated downslope of the new and existing runways. See drainage plan in Figure 2	Project planning and design.

Activity	Risk	Mitigation Strategy	Timing
Basic raw materials* sources.	Introduction of potentially infested basic raw materials to the Bremer Bay airfield represents a potential source of disease introduction to the airfield.	Gravel and other basic raw materials must be obtained from low-risk sources. Such areas include open paddocks that are high in the topographical profile. Preference should be given to gravel from within the same hydrological catchment as the protectable vegetation.	Project Planning and during construction. Raw material sources must be identified and assessed during the project planning phase to ensure low-risk sources are available during construction.
On-ground signage plan.	A lack of effective signage may result in inadvertent crossing of Clean on Entry points (CoE) within undertaking effective cleandown	Prior to construction works establish Clean on Entry points based on the construction plan and install signage at all sites. CoE points are to be located at any point of entry to areas mapped as uninfested.	Planning - Develop plan to be implemented during construction.
General Site Access			
Entering Site	Introduction of infested materials on field vehicles and/or footwear	Vehicle inspections are to be performed upon entry to the site. All vehicles must be Clean on Entry when accessing the site from Don Ende Drive or other site access points. Records of inspections are to be maintained.	Duration of construction.
Vegetation Clearing			
Staff and Contractor awareness	Staff and contractors without understanding of disease or pest management may	Ensure all staff and contractors working within the project area have undertaken appropriate site inductions and relevant Biosecurity awareness training. Records of	Project Planning and project induction.

Activity	Risk	Mitigation Strategy	Timing
	inadvertently breach hygiene controls.	inductions are to be maintained.	
Vegetation Clearing	Movement of potentially infested soil and pest species into uninfested protectable areas.	Vegetation clearing in infested areas must be performed separately to clearing in other areas. Material from clearing in infested areas must not be stored or re-used in any other area, including excluded areas. Vegetation cleared from infested areas may be used as brushing along drainage bunds constructed in infested areas.	Project construction phase.
		Vegetation clearing from within 20 m of existing infrastructure must be performed separately from clearing in *Protectable Areas*.	
		Vegetation cleared from within 20 m of existing infrastructure must not be stockpiled or used for rehabilitation (mulching) within *Protectable Areas*. It may be used for brushing along the drainage bund constructed in the infested area.	
New Runway Construction Works			
Staff and Contractor awareness	Staff and contractors without understanding of disease or pest management may inadvertently breach	Ensure all staff and contractors working within the project area have undertaken appropriate site inductions and relevant Biosecurity awareness training. Records of inductions are to be maintained.	Project Planning and project induction.

Activity	Risk	Mitigation Strategy	Timing
	hygiene controls.		
Accessing protectable vegetation from '*excluded*' areas	Movement of vehicles, equipment and machinery from '*excluded from survey'* areas may move potentially infested soil into *protectable areas*.	Conduct hygienic clean down inspections of all vehicles, machinery, equipment and footwear at CoE locations prior to entering *Protectable Areas*. If the inspection identifies any soil or plant material then a detailed hygienic clean down must be performed.	Inspections to be performed when crossing CoE points.
Soil movement activities (cut and fill, grading etc.)	Movement of potentially infested soils into protectable areas.	Soils, including topsoil from infested areas must not be stockpiled or reused in any other areas including excluded areas. Topsoil removed from infested areas may be re-used to construct drainage bunds inside the infested area.	Construction, during topsoil stripping and creation of drainage bunds
		Gravels and soils from within areas that are '*excluded from survey'* must not be moved into or used as fill in *protectable areas*.	
		Implement construction plan requiring all soil movement activities outside uninfested areas to be conducted separately to activities in the protectable areas of the new runway alignment.	
Importation of basic raw material	Introduction of potentially infested basic raw materials* to the	Gravel and other basic raw materials should be obtained from low-risk sources. Such areas include open paddocks that are high in	Project Planning and during construction. Raw material sources must be

Activity	Risk	Mitigation Strategy	Timing
	Bremer Bay airfield represents a potential source of inoculum to the airfield.	the topographical profile. Preference should be given to gravel from within the same hydrological catchment as the protectable vegetation.	identified and assessed during the project planning phase to ensure low-risk sources are available during construction.
Green Bridging infested areas	Vehicles, machinery and pedestrians crossing infested soils may pick up and transport infested soils into other areas	Use imported low risk BRM to construct a green bridge across the infested area. Construction of a green bridge will separate construction workers from infested soils, reducing the risk of disease spread. See Appendix B	Construction, immediately following vegetation clearing and topsoil stripping
Construction of new firebreaks and perimeter fence	Firebreaks and the perimeter fence constructed around the new cross runway will be new potential vectors of the disease and weeds into currently uninfested areas.	CoE locations are to be established at any point on new and existing firebreaks and fence alignments where these intersect infested areas.	Construction of firebreaks and perimeter fence.
		Low lying and or water gaining sites occurring along new firebreaks and fence alignments are to be green bridged to separate vehicles from environments conducive to Phytophthora Dieback.	
Record Keeping and Monitoring			
Staff and Contractor Inductions	Staff and contractors without understanding of disease or pest management may inadvertently breach	All staff and contractor inductions are to include the disease and pest hygiene requirements defined in this OHMP. A record of all inductions is to be maintained and provided for inclusion in closure reporting.	Project duration.

Activity	Risk	Mitigation Strategy	Timing
	hygiene controls.		
Clean down inspections	Ineffective application of hygiene may result in a breach of hygiene controls.	Clean on Entry vehicle inspection reports are to be developed and completed upon access to site. Completed reports to be included in project closure reporting.	Project duration.
Hygiene inspections	Ineffective application of hygiene may result in a breach of hygiene controls.	A minimum of two opportunistic site inspections are to be conducted by a *Phytophthora* disease specialist to ensure appropriate operational hygiene is applied.	Opportunistic inspections during construction works.
Project closure report.		A project closure report is to be developed and submitted to DBCA for review. The report must demonstrate effective implementation of the OHMP and include induction records, raw material assessments, updated disease occurrence assessment reports and hygiene inspection reports.	Within 2 months of construction completion.
Post Construction Monitoring			
Phytophthora Dieback survey	Breaches of the operational hygiene measures may result in undetected disease spread	Annual monitoring of vegetation adjoining the new cross runway and associated firebreaks is to be undertaken for a period of three years from the completion of construction works. Monitoring results must be compared with the 2024 Phytophthora dieback occurrence data	Annually for three years from the completion of construction

Activity	Risk	Mitigation Strategy	Timing
		to assess if any disease extensions are attributable to cross runway construction works.	
Targeted Weed survey	Breaches of the operational hygiene measures may result in undetected weed introduction	Annual monitoring of vegetation adjoining the new cross runway and associated firebreaks is to be undertaken for a period of three years from the completion of construction works. Monitoring results must be compared with the 2024 weed occurrence data to assess if any weed introductions are attributable to cross runway construction works.	Annually for three years from the completion of construction

* basic raw materials include imported non-organic material such as sand, gravel, blue metal etc.

6 REFERENCES

Bureau of Meteorology (The Bureau) (2020): http://www.the Bureau.gov.au/climate/data/

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

Department of Biodiversity Conservation and Attractions (DBCA) (2020), *Phytophthora Dieback Management Manual*, Perth

Great Southern Bio Logic (GSBL) (2024): *Bremer Bay Cross Runway Construction – Environmental Surveys 2024 V2*, unpublished report produced for the Shire of Jerramungup

7 DISCLAIMER

This report was prepared for the Shire of Jerramungup, solely for the purposes set out in the scope of works and it is not intended that any other person use or rely on the contents of this report.

Whilst the information contained in the Report is accurate to the best of our knowledge and belief, Great Southern Bio Logic and its agents cannot guarantee the completeness or accuracy of any of the descriptions or conclusions based on the information supplied to it or obtained during the site investigations, site surveys, visits and interviews. Furthermore, field and / or regulatory conditions are subject to change over time, and this should be considered if this report is to be used after any significant time period after its issue.

Great Southern Bio Logic and its agents have exercised reasonable care, skill and diligence in the conduct of project activities and preparation of this report. However, except for any non-excludable statutory provision, Great Southern Bio Logic and its agents provided no warranty in relation to its services or the report, and is not liable for any loss, damage, injury or death suffered by any party (whether caused by negligence or otherwise) arising from or relating to the services or the use or otherwise of this Report.

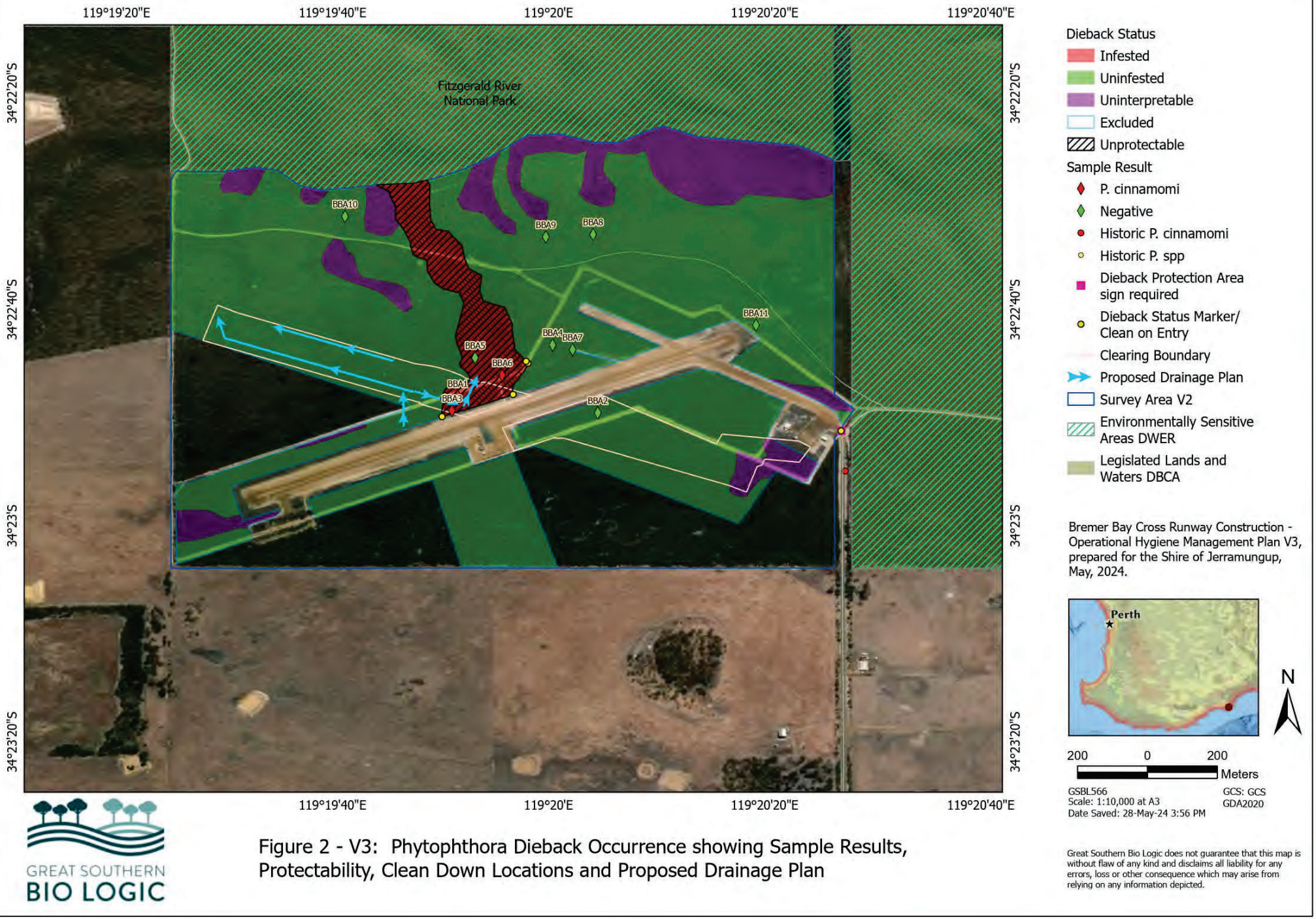
This report must be read, copied, distributed and referred in its entirety.

Figures

Bremer Bay Cross Runway Construction - Operational Hygiene Management Plan

GREAT SOUTHERN
BIO LOGIC

Figure 1: Regional Location



GREAT SOUTHERN BIO LOGIC

Figure 2 - V3: Phytophthora Dieback Occurrence showing Sample Results, Protectability, Clean Down Locations and Proposed Drainage Plan

Appendix A

Example hygiene inspection checklist and record

Environmental Hygiene Inspection Check List

Vehicle/Machinery/Equipment DETAILS			
Inspection Date		**Inspected By**	
Vehicle/Machine			
Clean on Entry Location			

ITEMS Inspected:
✓ to confirm they have been inspected and are free of soil/vegetation or N.A if Not applicable

Item/s	Yes	N.A	Item/s	Yes	N.A
Suspension	☐	☐	Radiators/air vents	☐	☐
Tray	☐	☐	Engine compartment	☐	☐
Wheels	☐	☐	Ground Engaging Tools	☐	☐
Spare Wheel	☐	☐	Trays/Bumpers/Racks/Covers	☐	☐
Mud Flaps	☐	☐	Screens/Belts	☐	☐
Wheel wells	☐	☐	Chassis/Sub Frame	☐	☐
Rock guards	☐	☐	Running Gear/Belly Plate	☐	☐
Augers	☐	☐	Ladders Footsteps and Platforms	☐	☐
Fencing wire and hardware	☐	☐	Machine bucket/ blade	☐	☐
Tool boxes	☐	☐	Tracks	☐	☐
All tools kept in vehicles and machinery are also clean and free from soil and plant material				☐	☐
Interior and any storage areas free of mud, soil and vegetation				☐	☐
Equipment okay to enter/leave site/project area				☐	☐

Comments

Inspected By					
Name		**Signature**		**Date**	

Appendix B

Green Bridging – Excerpt from PDMM defining Green Bridge Construction

Appendix 23 Green bridges

Green bridges to reduce dieback risk

Carriers can inadvertently spread dieback when they pick soil up from the running surface of infested roads and 'carry' it to uninfested areas. Through the creation of a continuous uninfested and well drained running surface 'green bridges' can significantly reduce the likelihood of spreading dieback.

Green bridges are constructed by adding a layer of *Phytophthora*-free BRM over an infested, low-lying or permanently wet section of road. The green bridge must be sufficiently thick and well-constructed to prevent contact between the carrier and underlying infested material and to prevent contamination of the green bridge from the underlying infested material.

Green bridge applications

Green bridges have been used in the following applications:

- provide uninfested access between protectable areas;
- reduce multiple clean down points in close proximity during an activity that requires access along an alignment that traverses discrete infestations; and
- reduce the dieback risk of access associated with mining; timber-harvesting; powerlines and pipelines.

Temporary versus long-term green bridges

A green bridge may be required to provide uninfested access: temporarily during a discrete disturbance activity; or long-term such as across low-lying areas or permanently wet crossings. Regardless of the purpose, a green bridge requires monitoring and maintenance to remain effective in reducing dieback spread.

Temporary green bridges constructed during a disturbance activity should consider additional and supporting dieback management tactics including, but not restricted to: split phase access (e.g. between timber harvesting and timber haulage); split phase by mini-catchment and; restricting the season of the proposed activity to lower risk periods (i.e. not wet).

Considerations in deciding to construct a green bridge

The green bridge option should not be used as justification to construct high profile roads or for putting additional areas at risk from dieback. The decision to construct a green bridge should only be taken after considering:

- alternative dieback management options which can also prevent vehicles from picking up infested material:
    - close road or use alternative access routes;
    - split an activity to avoid the infested area(s);
    - require 'no soil movement' access;
    - seal road and/or build a bridge over the stream.
- the lead-in time required to plan (see following section on planning requirements) and construct a green bridge *prior* to use during an associated disturbance activity;

- the feasibility of constructing a green bridge to the required use and engineering specifications e.g.:
    - a temporary versus a longer-term structure;
    - the type, frequency and speed of traffic that will use the green bridge and will the road be used as strategic access for future use (e.g. fire) as these all influence engineering requirements;
    - engineering and ecological requirements where a green bridge will span a watercourse requiring the installation of drainage;
    - the length of bridging required.
- the monitoring and maintenance requirements to ensure the green bridge continues to be effective in reducing dieback risk over its lifespan;
- the availability of uninfested BRM; and
- green bridges should be discouraged on category E 'tracks' as by nature they have poor road surface drainage due to basic design. All alternatives should be considered in the first instance.

Planning requirements in green bridge construction

While designed to reduce dieback risk, construction of a green bridge is itself a disturbance activity that poses a dieback risk due to the involvement of heavy machinery, soil movement and introduction of BRM. Consequently, construction of a green bridge requires:

- a DAS application and as part of that:
    - a dieback risk assessment and most likely the development and implementation of a DMP;
    - development of a Road Access Plan (CEM 018).
- the DMP for the construction and ongoing maintenance of a green bridge should include the following dieback risk reduction approaches:
    - seek to reduce the dieback risk as low as practically possible and ensure that the area put at risk from dieback is minimised;
    - carried out in dry conditions;
    - road closed to all other traffic during construction and maintenance;
    - machine work with appropriate separation and hygiene to prevent the spread of dieback between infested and uninfested areas;
    - installation and maintenance of appropriate drainage to ensure the green bridge is free draining, rutting or ponding does not occur and drainage water is not directed into uninfested areas during, or as a result of the construction;
    - careful sourcing, transport, delivery and installation of uninfested BRM so that it does not become contaminated during construction;
    - installation of tape and/or appropriate signage to indicate the extent of the green bridge, COE requirements, adjacent infested areas and the requirement to avoid entering them;
    - if water is required for compaction use scheme or tank rainwater, but if local open water sources must be used treat the water before application (Appendix 17); and
    - suitable clean machinery and records of vehicle / machinery onsite.

Materials used in green bridge construction

The types of BRM that are typically used to construct green bridges in the dieback vulnerable zone are described briefly in the following table.

BRM	Advantages	Disadvantages
Quarried blue metal ballast	• Can support heavy traffic • Works well as base and top layer • Strong and not prone to dissolving or leaching • Free draining • Generally mostly free of soil and root material • Could be washed in-situ to remove any contaminating material	• Expensive, except in vicinity of mines that sell as by-product (e.g. around Greenbushes) • Will generally need to be transported long distances for DBCA applications • Cannot be compacted unless fines included as in granite road base • Can be difficult to verify dieback status
Gravel	• Locally available in many parts of the vulnerable zone • Does not dissolve and does not modify chemistry in areas of use • Relatively inexpensive	• Turns to mud when laid down in very wet conditions • Known to harbour *Phytophthora* • Can be difficult to verify dieback status
Shale	• Does not dissolve and does not modify chemistry in areas of use • Relatively inexpensive	• Restricted availability • Good as a base layer but requires a top layer of gravel • Difficult to compact • Can corrugate in dry conditions • Known to harbour *Phytophthora* • Can be difficult to verify dieback status
Crushed limestone	• Readily compacted • Considered to be inhibitory to *P. cinnamomi*	• Prone to breaking up (in summer), dissolving and washing away • Good as a base layer but requires a top layer of gravel • Dissolved materials with potential to leach into surrounding areas and water courses altering pH • Not inhibitory to *P. multivora* • Can be difficult to verify dieback status

Uninfested BRM

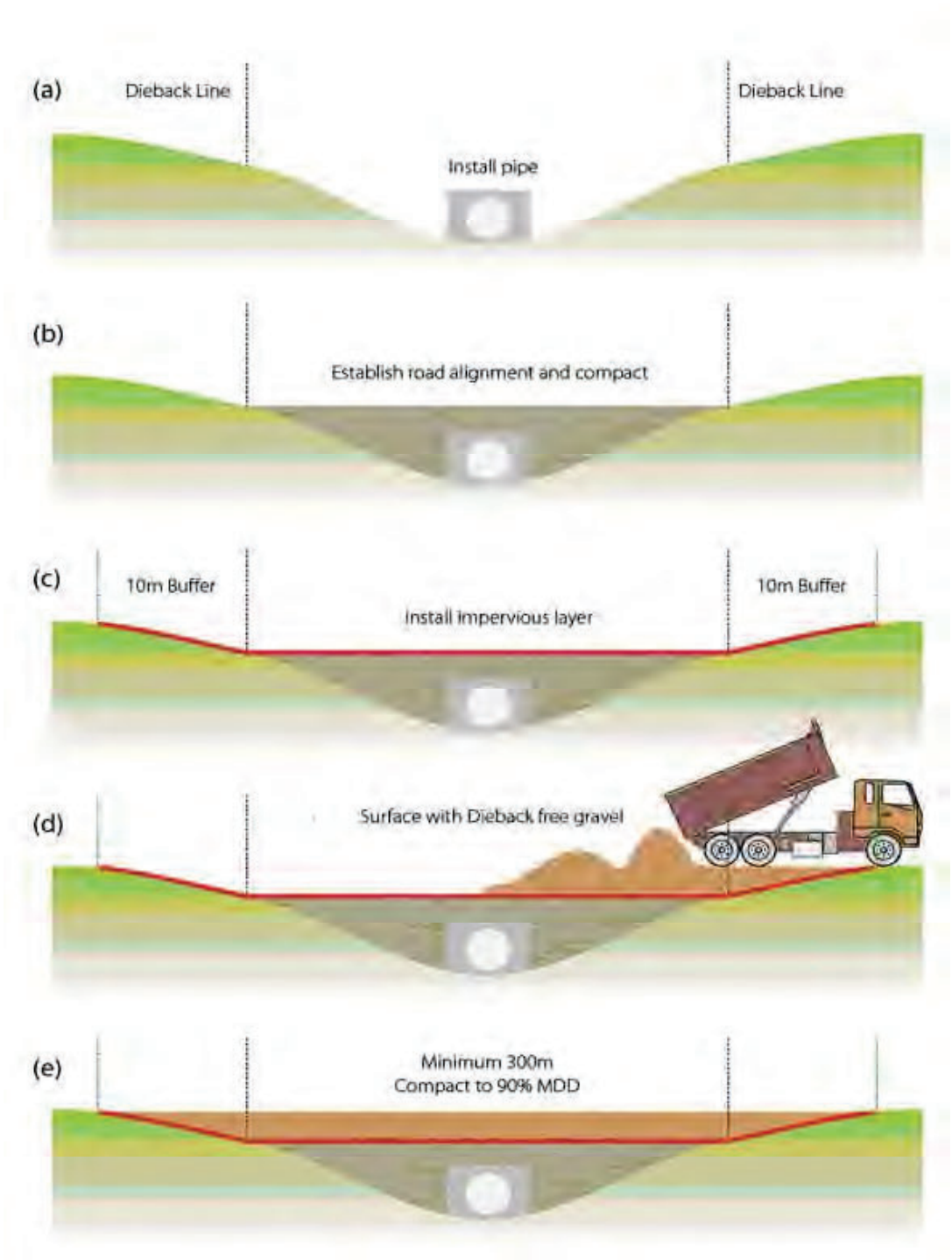
One of the most important criteria for BRM used in the construction of a green bridge is that it is uninfested (also referred to as dieback-free). Currently the department's standard for uninfested BRM is that:

- It has been sourced from a site that was assessed as uninfested by an Interpreter;
- The site has been managed and monitored since assessment to maintain the uninfested status (including hygienic excavation and transport of the BRM to the site of use).

It has been noted in the table above that it can be difficult to verify the dieback status of BRM. The reason for this statement is that gravel is often sourced from quarries or pits that, even if initially assessed as uninfested, have not been managed to maintain their uninfested status. Gravel is sometimes sourced from agricultural paddocks and this is usually of unknown dieback status, also quarries and pits that are unmanaged for dieback can be contaminated with *Phytophthora* through the use of dirty machinery in excavation and stockpiling, or by dirty haulage vehicles.

Where the dieback status of BRM from unmanaged quarries or pits, and paddocks is unknown, the unknown dieback status can theoretically be tested in the laboratory for the presence of *Phytophthora*. However, the number of samples needed to give a statistically valid result is very high (in the 100s) making it a cost-prohibitive option.

Metham sodium has recently been registered for treating gravel to kill *Phytophthora*. DBCA are currently collaborating with Main Roads on developing a protocol for commercial scale treatment of gravel with metham sodium and an associated compliance system. The eventual uptake of the technology will provide another and potentially more sustainable option for sourcing uninfested gravel than excavating it from uninfested forest.



A schematic cross-section of a green bridge over an infested depression in the landscape in which drainage has been installed, and uninfested (dieback free) BRM has been used to fill the depression and construct a 10 m tapered buffer of uninfested BRM on either side of the bridge.