



Pioneer Sand Quarry

WEED & DISEASE HYGIENE MANAGEMENT PLAN

20 May 2024

For Sanbar Pty Ltd

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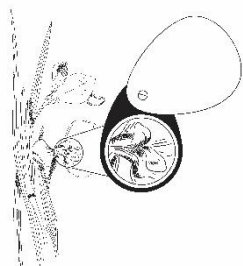
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Project	Reworking mine tailings, ML 10M2008
Location	Racecourse Road, Pioneer, South Mount Cameron, Tasmania
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Version	Date	Author	Position	Comment
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EXECUTIVE SUMMARY

Sanbar Pty Ltd is investigating the reworking of mine tailings at the mining lease 10M/2008 at Pioneer in the northeast of Tasmania. The Environmental Protection (EPA) has requested that the Pioneer Sand Quarry – Environmental Effects Report (Revision 1) include a Weed and Disease Hygiene Management Plan.

North Barker Ecosystem Services has mapped weeds on site and noted the occurrence of two declared weed species Montpellier broom and Spanish heath. Environmental weeds are present across the quarry area with cumbungi and radiata pine being locally abundant. Recommendations for control have been made for each weed species, using a combination of physical and chemical techniques.

Racecourse Road and the nearby township of Pioneer, being less than one kilometre away, have a variety of declared and environmental weeds. There is a risk of vehicles and machinery spreading these weeds from nearby areas into the quarry site.

Weeds recorded in the mining lease:

Declared weeds

- Montpellier broom (*Genista monspessulana*)
- Spanish heath (*Erica lusitanica*)

Environmental weeds

- cumbungi (*Typha latifolia*)
- radiata pine (*Pinus radiata*)

Weeds recorded in the surrounding area:

Declared weeds

- blackberry (*Rubus anglocandicans* and *Rubus fruticosus*) (WoNS)
- English broom (*Cytisus scoparius*) (WoNS)
- Montpellier broom (*Genista monspessulana*) (WoNS)
- Paterson's curse (*Echium plantagineum*)
- sallow willow (*Salix matsudana*) (WoNS)
- silver pampas grass (*Cortaderia selloana*)
- Spanish heath (*Erica lusitanica*)

Environmental Weeds

- arum lily (*Zantedeschia aethiopica*)

There is a 2011 Natural Values Atlas record for *Phytophthora cinnamomi* (PC) on the western edge of the mining lease boundary near to Pioneer Lake. During the current survey, no symptomatic evidence of pathogens including PC or chytrid fungus were observed on site, however susceptible species are present across the project area and there is the potential for PC to be spread further across the site.

A series of site hygiene measures have also been specified to aid weed and pathogen prevention, containment and management across the project area for an initial five-year period, after which time this management plan will need to be reviewed and updated. Vehicles and machinery are not to access within 30 meters of the areas infested with Spanish heath and *Phytophthora cinnamomi*.

A dedicated inspection area near the main Pioneer Sand Quarry mining lease entrance will ensure that machinery is routinely inspected prior to entering and exiting the facility. Earth moving machinery will be cleaned prior to entering the site. Road trucks are to remain on the designated main single haul road whilst accessing the mining areas for loading of sand. The use of a compressed air blow down is recommended for machinery when leaving the site.

Based on our recommended methods and schedule, estimated costs for primary weed treatment (excluding treatment of radiata pines) are approximately \$1,500, follow-up costs are predicted to decrease over time from approximately \$1,200 to \$400 and monitoring between \$1,500 - \$1,700 annually, resulting in a total cost estimate of around \$16,600 over five years. Any additional costs related to ongoing annual monitoring and control after this period have not been included in this report.



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1. PROJECT DETAILS

1.1. INTRODUCTION

Sanbar Pty Ltd is investigating the reworking of mine tailings at the mining lease 10M/2008 at Racecourse Road, Pioneer, South Mount Cameron 10 km east of Winnaleah in the northeast of Tasmania. The area has been previously mined for gold and tin from alluvial deposits between 1877 and 1955.

The project area covers 31.2 hectares and consists of regenerating native vegetation on tailings heaps with small patches of more intact native vegetation generally associated with watercourses. The site is accessible off Racecourse Road on an all-weather gravel road. There is a network of tracks that provide access to swimming and boating on nearby Pioneer Lake and vehicular access to the project area. The tenure of the project area is entirely Future Potential Production Forest (Crown).

In 2023, the proponent engaged North Barker Ecosystem Services (NBES) to undertake flora surveys and fauna habitat assessment of the project area, and to make recommendations to minimise impacts to threatened natural values. As part of this Natural Values Assessment report¹ NBES recommended that a Weed, Disease and Hygiene Management Plan be prepared. The Environmental Protection Authority has now requested that the Pioneer Sand Quarry – Environmental Effects Report² include a Weed and Disease Hygiene Management Plan as per the EER Guidelines (Extractive Industry) – Sanbar Pty. Ltd.³ under Part C Environmental Impacts and Management section 5 as follows -

5 Weeds, pests, and pathogens

- There are numerous weeds declared under the *Weeds Management Act 1999* recorded within 5 km of the mining lease including Spanish heath (*Erica lusitanica*), St johns-wort (*Echium plantagineum*), and silver pampasgrass (*Cortaderia selloana*). *Phytophthora cinnamomi* (PC) is mapped as occurring within 1000 m of the mining lease.
 - Include commitments to survey for and manage weeds and diseases on the property and to prepare and implement a Weed and Disease Management Plan.
 - Further information on preparing weed and disease management plans is in the NRE (2015) *Weed and Disease Planning and Hygiene Guidelines - Preventing the spread of weeds and diseases in Tasmania*: [Weed and Disease Planning and Hygiene Guidelines | Department of Natural Resources and Environment Tasmania \(nre.tas.gov.au\)](https://www.nre.tas.gov.au/Weed-and-Disease-Planning-and-Hygiene-Guidelines). Practical information on how to minimise the risks of introducing and spreading PC can be found in the manual [Keeping it clean - A Tasmanian field hygiene manual to prevent the spread of freshwater pests and pathogens](#)
- Evaluate the potential for the activity to introduce or spread weeds and diseases to, from and within the site.
- Discuss the proposed management measures for preventing the spread of weeds, pests, and pathogens (e.g., vehicle washdown procedures).

The proponent engaged NBES to write the Weed and Disease Hygiene Management Plan taking into consideration current infestations and that vehicles and machinery moving on and off site, or materials imported onto or exported from the site, have the potential to spread weeds and diseases and this risk is increased with the proposed reworking of the mine tailings.

This report addresses Management Measure 4: Weed and Disease management in the Environmental Effects Report.

¹ North Barker Ecosystem Services (2024)

² Sanbar Pty Ltd (2024)

³ Environment Protection Authority (2023)

MANAGEMENT MEASURE 4: WEED AND DISEASE MANAGEMENT		
Item	Proposed measure	Timeframe
8.	A Weed and Hygiene Management Plan specific to this site and operation and as a minimum complying with the <i>Weed and Disease Planning and Hygiene Guidelines</i> will be implemented.	Upon issue of a permit

The proposed works occur within the Dorset municipality. The Dorset Council Strategic Plan 2023-2032⁴ includes an Environmental Footprint objective to proactively engage in strategies that result in sustainable natural resource management for Dorset.

1.2. METHODS AND SURVEY AREA

Field surveys were carried out by two ecologists from NBES on 12th March 2024 when declared weed species, as listed under the Tasmanian *Biosecurity Act 2019* and associated *Biosecurity Regulations 2022* and/or listed as a Weed of National Significance (WoNS) under the Australian Weed Strategy 2017-2027⁵ as well as environmental weeds of concern were recorded across the project area.

In addition, during the Natural Values Assessment, ecologists surveyed for any symptomatic evidence of pathogens.

All assessments were undertaken in accordance with the *Guidelines for Natural Values Surveys*⁶. All location data were recorded with a hand-held GPS.

Botanical nomenclature follows the current census of Tasmanian plants⁷

The Project Area is shown in Figure 1. The proposed quarry development general arrangement and staging plan including the route of future access single haul road is defined in Figure 2.

1.3. LIMITATIONS

Due to seasonal variations in presence, detectability and discrimination (i.e. identification of closely related species), there may be some species present on the site that have not been identified or observed.

The entire mining lease was not surveyed, rather the weed and disease survey was restricted to the project area outlined in red in Figure 1 (as defined by Integrated Land Management & Planning) and a 150 meter buffer area extended around the perimeter of this area.

⁴ Dorset Council (2023)

⁵ Commonwealth of Australia (2017)

⁶ Department of Primary Industries, Parks, Water and Environment (2019)

⁷ de Salas and Baker (2023)

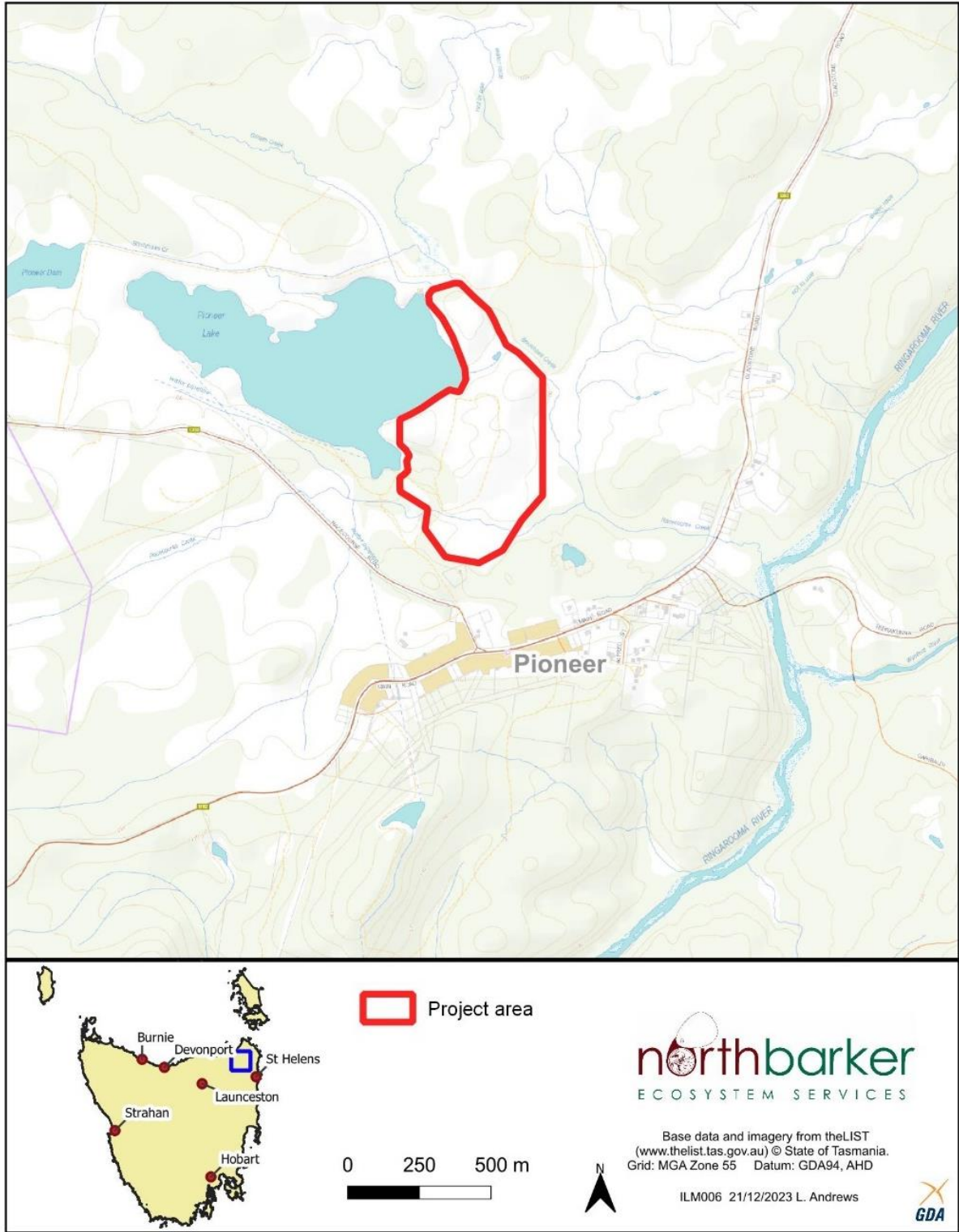


Figure 1: Location of the proposed active mining area

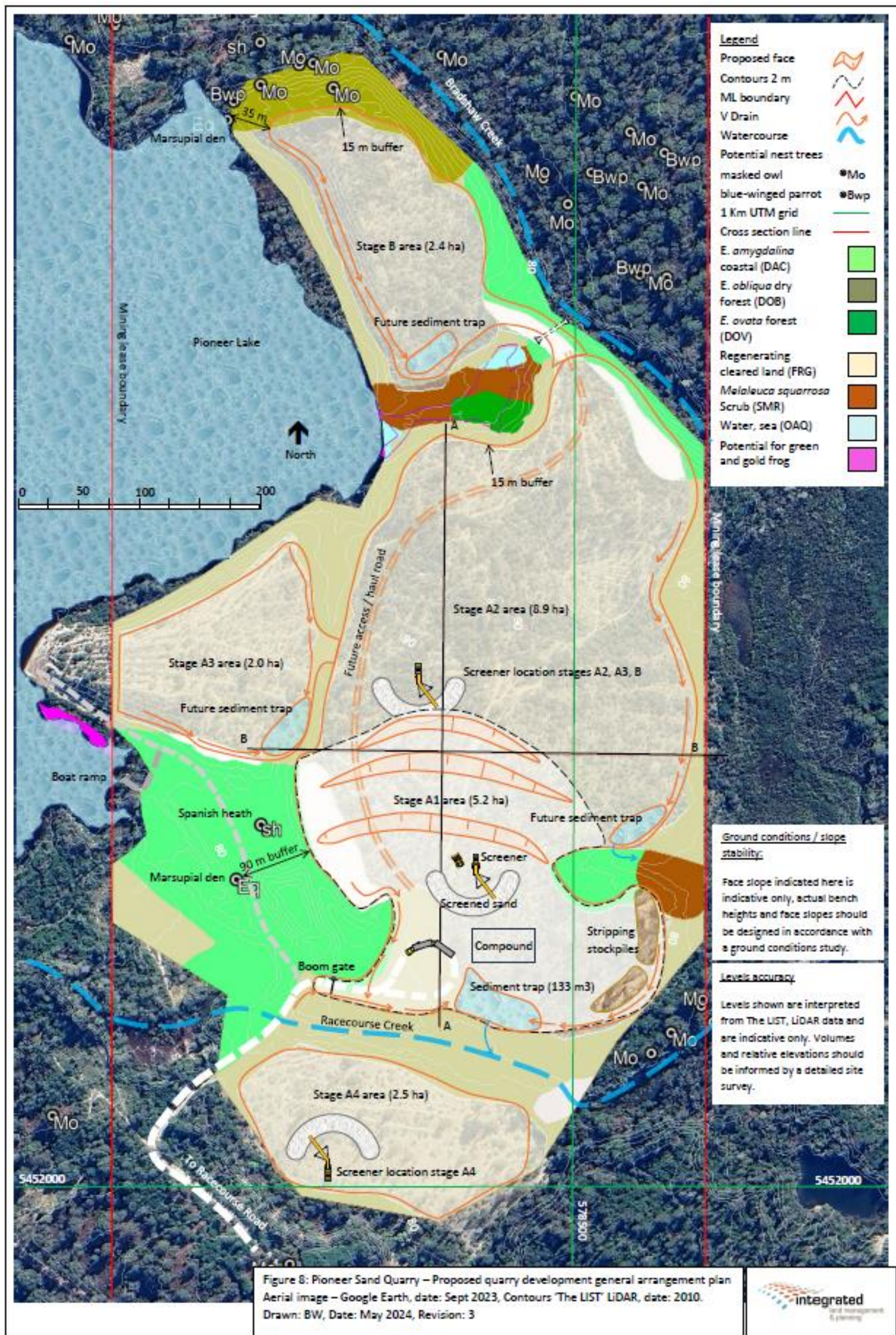


Figure 2: Pioneer Sand Quarry – Proposed quarry development general arrangement plan including route of future on-site single haul access road

2. LEGISLATIVE CONTEXT

2.1. *BIOSECURITY ACT 2019* – GENERAL BIOSECURITY DUTY

Under the Tasmanian *Biosecurity Act 2019* (BA 2019) a General Biosecurity Duty operates as a statutory “duty of care”. This means that a person (which includes all levels of government, individuals, and private corporate entities) has to take all reasonable and practical measures to prevent, eliminate, or minimise biosecurity risks. The general biosecurity duty supports the principles of shared responsibility.

2.2. WEEDS OF NATIONAL SIGNIFICANCE

Weeds of National Significance (WoNS) are those weed species which have been listed under the *Australian Weed Strategy 2017-2027*⁸. These nationally recognised weeds have significant environmental and economic impact at a national scale⁹. All WoNS are declared weeds in Tasmania. Management of WoNS may be supported by nationally funded strategies and programs. It is expected that State and regional weed management planning will pay particular attention to the management of WoNS. Their presence, however, does not confer any additional requirement on landowners beyond State weed legislation.

2.3. DECLARED WEEDS

The Tasmanian *Biosecurity Act 2019* and associated *Biosecurity Regulations 2022* include a list of declared weeds (listed as declared pests). Statutory weed management plans exist for the majority of listed species. These include a classification of each weed at the municipal level and provide direction as to their management intent.

Class A municipalities for a particular weed are those that are yet to be detected or are limited to localised infestations that are deemed to be eradicable. Therefore, the objective is the eradication of infestations.

Class B municipalities are those which host moderate or large and widespread infestations of the declared weed that are not deemed eradicable because the feasibility of effective management is low at this time. Therefore, the objective is containment of infestations. This includes preventing spread of the declared weed from the municipality or into properties currently free of the weed or which have developed or are implementing a locally integrated weed management plan for that species. As well there is a requirement to prevent spread of the weeds to properties containing sites for significant flora, fauna, and vegetation communities.

In this report, weeds have been classified according to their declaration status for the Dorset municipality.

2.4. DORSET COUNCIL STRATEGIC PLAN 2023 - 2032

The Dorset Council Strategic Plan 2023-2032¹⁰ was developed by council and is a requirement of the *Local Government Act 1993*. The plan includes an Environmental Footprint objective to proactively engage in strategies that result in sustainable natural resource management for Dorset. It includes the strategic imperative 17.1 to review, adopt and implement weed management strategy and planning.

⁸ Commonwealth of Australia (2017)

⁹ Commonwealth of Australia (2017)

¹⁰ Dorset Council (2023)

3. INTRODUCED PATHOGENS

3.1. *PHYTOPHTHORA CINNAMOMI*

Commonly referred to as dieback or root rot fungus, *Phytophthora cinnamomi* (PC) is a soil-borne fungus exotic to Tasmania. The fungus is pathogenic, requiring plant tissue as a food source. By parasitising its feeder roots, PC can fatally starve its host plants of nutrients and water. Members of the Ericaceae, Myrtaceae and Proteaceae families, among them numerous threatened species, are known to be highly susceptible to PC¹¹. When infected, susceptible species display a characteristic progression of morphological traits, beginning with leaf-yellowing, progressing to substantive dieback (browning) and ending in death. Other potentially fatal processes, such as drought, can cause similar visual symptoms to PC, but the impact of drought at a given location tends to vary less within and between species. Thus, a mosaic of symptomatic and healthy plants can be a good indicator of the presence of PC, in particular if symptoms are concentrated in susceptible species and in moist locations.

The establishment and spread of PC are generally restricted to areas that receive above 600 mm of rainfall per annum and are below 900 m altitude (predominantly below 600 m)¹². Temperature is critical, with the disease not impacting areas where the mean annual temperature is below 7.5 °C, and in closed-canopy environments requiring disturbance that facilitates soil temperatures to exceed 15 °C. Rainfall is crucial because the life cycle of PC depends on moist conditions for growth, spore production and dispersal.

Humans are the primary long-distance dispersal agent of PC, with contaminated soil being spread on vehicles, quad bikes, side by sides, construction machinery and walking boots¹³. PC spores and infected root material can be transported in minute quantities of soil, but the risk of infection increases with the quantity of soil moved. Thus, vehicles that tend to accumulate large sods of soils during works pose the greatest risk of spreading contaminants. Once established at a site, PC can spread rapidly through root contact and water movement (above and below ground).

3.2. CHYTRID FUNGUS

Chytrid fungus (*Batrachochytrium dendrobatidis*) causes the infectious disease, chytridiomycosis, which is affecting amphibians worldwide, including Tasmania. The fungus grows on the animal's skin and causes it to harden¹⁴. Frogs absorb water and mineral salts through the skin and the infected hardened skin is no longer able to perform this function. The resulting imbalance causes metabolic changes that kill the animal. It is capable of causing sporadic deaths in some populations and up to 100 per cent mortality in others.

Human population density has been found to be a highly influential (positive) variable in the presence of the pathogen¹⁵. The spread of the pathogen is considered likely to be promoted by human activity in Tasmania, as its occurrence in remote wilderness areas is positively associated with variables linked to human-disturbance, including gravel roads¹⁶.

Note that evidence of chytrid fungus is not specifically searched for although management of risk of spread is considered. This means that any susceptible frog species found within the Project Area are potential vectors for the disease.

¹¹ Podger & Brown (1989); Barker & Wardlaw (1995)

¹² Podger & Brown (1989); Podger *et al.* (1990)

¹³ Department of Primary Industries, Parks, Water and Environment (2015)

¹⁴ Department of Primary Industries, Parks, Water & Environment (2015)

¹⁵ Rohr *et al.* (2011)

¹⁶ Pauza *et al.* (2010)

4. WEED SPECIES AND DISTRIBUTION

A total of seven introduced flora are recorded in the project area (Appendix 1). The mining lease including the project area has been historically disturbed by alluvial mining and is revegetating with predominantly local native species. There are two declared weeds Montpellier broom (*Genista monspessulana*) and Spanish heath (*Erica lusitanica*) recorded from within the mining lease. Figures 2 3 and 4 show the distribution of Spanish heath and Montpellier broom within the mining lease. In addition, there are areas with significant numbers of radiata pine (*Pinus radiata*), an environmental weed, especially in the project area where sand mining has occurred in the past. Cumbungi (*Typha latifolia*) is present in the impoundment between Stage A2 and Stage B within the project area (see Figure 2).

The surrounding areas including Racecourse Road and the Pioneer township, have areas with an additional seven declared weeds. Racecourse Road has areas of Spanish heath and the nearby township of Pioneer, being less than one kilometre away, has a variety of declared and environmental weeds including blackberry (*Rubus anglocandicans* and *Rubus fruticosus*), English broom (*Cytisus scoparius*), Montpellier broom, Paterson's curse (*Echium plantagineum*), sallow willow (*Salix matsudana*) silver pampas grass (*Cortaderia selloana*) and Spanish heath as well as environmental weeds including arum lily (*Zantedeschia aethiopica*) and other garden escapes. The declared weeds blackberry, English broom, Montpellier broom and willow are also Weeds of National Significance (WoNS). There is a risk of vehicles and machinery spreading these weeds from surrounding areas into the quarry site.

Figure 4 shows the distribution of declared weeds in the area surrounding the mining lease.

Table 1: Weed species recorded within the mining lease

Species	WoNS	Tasmanian Biosecurity Act 2019	Extent
Montpellier broom <i>Genista monspessulana</i>	Yes	Class B	Recorded along main access route to the project area within mining lease.
Spanish heath <i>Erica lusitanica</i> (Plate 1)	No	Class A	Isolated areas in the southwest in <i>E. amygdalina</i> bushland and north of the project area within the mining lease.
cumbungi <i>Typha latifolia</i> (Plates 2)	No	-	In impoundment on edge of regenerating <i>E. ovata</i> bushland between Stage A2 and Stage B as well as along Pioneer Lake foreshore in the mining lease area
radiata pine <i>Pinus radiata</i> (Plates 3,4)	No	-	Numerous plants scattered throughout the project area more commonly in the south, ranging from small saplings to large mature trees.

Table 2: Weed species recorded in areas surrounding the mining lease

Species	WoNS	Tasmanian Biosecurity Act 2019	Extent
blackberry <i>Rubus anglocandicans</i> and <i>fruticosus</i>	Yes	Class B	Recorded along Main Road and at 25 Main Road Pioneer (NVA records).
English broom <i>Cytisus scoparius</i>	Yes	Class B	Recorded at 25 Main Road Pioneer (NVA record).
Montpellier broom <i>Genista monspessulana</i>	Yes	Class B	Recorded at 25 Main Road Pioneer (NVA record).
Paterson's curse <i>Echium plantagineum</i>	No	Class A	Recorded at 25, 27, 32 & 35 Main Road Pioneer and on adjacent Crown Land (NVA records).
sallow willow <i>Salix matsudana</i>	Yes	Class B	Recorded at 25 Main Road Pioneer (NVA record).
silver pampas grass <i>Cortaderia selloana</i>	No	Class A	Recorded at 32 Main Road Pioneer (NVA record).
Spanish heath <i>Erica lusitanica</i>	No	Class A	Recorded along Main Road and 25 Main Road Pioneer (NVA records).

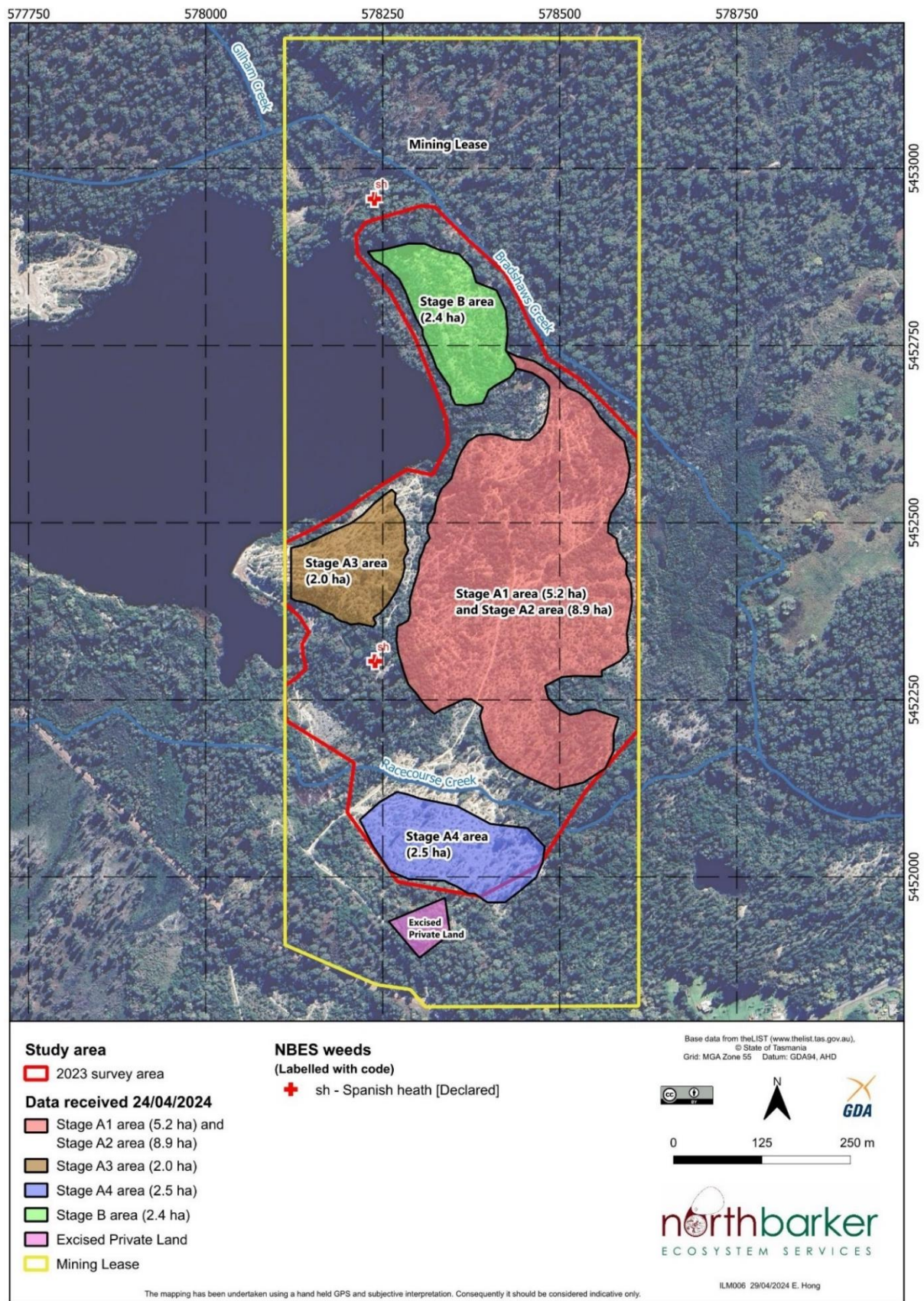


Figure 3: Distribution of declared weeds in the mining lease

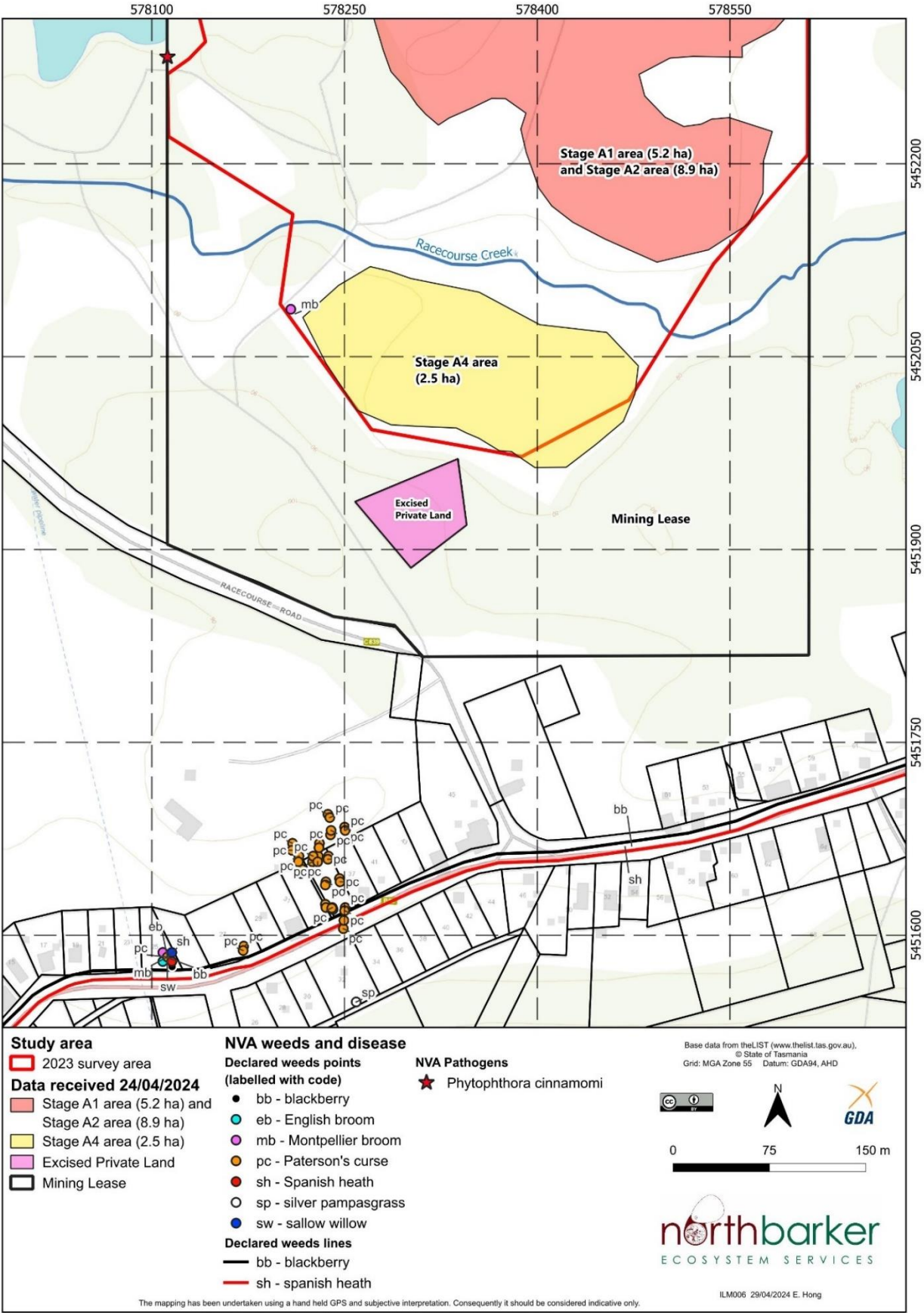


Figure 4: Distribution of declared weeds in the area surrounding the mining lease



Plate 1: Spanish heath (*Erica lusitanica*) within *Eucalyptus amygdalina* regenerating bushland in the southern area



Plate 2: Cumbungi (*Typha latifolia*) in impoundment area, northern project area



Plate 4: Pine (*Pinus radiata*) in project area



Plate 5: Pine (*Pinus radiata*) in project area

5. DISTRIBUTION OF PATHOGENS

5.1. *PHYTOPHTHORA CINNAMOMI*

There is a 2011 Natural Values Atlas record for *Phytophthora cinnamomi* (PC) on the western edge of the mining lease boundary (see Figure 4). This is adjacent to a public access track for boat launching at Pioneer Lake. It is also used for recreational quad and side by side biking that has the potential to spread PC across the mining lease and the broader NRE Tas (Future Potential Production Forest) area.

No evidence of PC was recorded during field surveys; however, susceptible vegetation is present in the project area and mining lease and thus mitigation measures are required to manage this risk.

5.1.1. Mitigation

The greatest risk of spread of PC is to the surrounding vegetation or regenerating open areas on the margins of clearings. No machinery or disturbance should occur in the vicinity of the 2011 historic record. In addition, soil disturbance should be restricted to the footprint of works and trucks entering the site for sand loading should remain on the on-site single haul access road at all times.

The vehicle and machinery hygiene protocols adopted in the WDHMP will also be effective in minimising the risk of introducing PC within and from the project area, which at this stage is believed to be largely PC free.

Active management to continually limit the spread of PC remains a focus of Tasmania's control strategy. Ongoing monitoring for future infections plays an important role and are included in the WDHMP.

5.2. CHYTRID FUNGUS

No threatened frogs were recorded during field surveys. There is habitat for both the green and gold frog and striped marsh frog within the project area and mining lease. This is localised and although likely to provide breeding habitat in wet years is unlikely to support breeding habitat through periods of drought when they will be constrained to larger and more permanent water bodies with the necessary habitat features.

The project presents a risk of spreading chytrid fungus and, as such, mitigation measures are required. The vehicle washdown hygiene protocols adopted in a WHMP will also be effective in minimising the risk of introducing chytrid fungus to the project area, which at this stage is believed to be chytrid free.

5.2.1. Mitigation

The greatest risk of spreading chytrid fungus into the project area and broader mining lease is by the construction of new roads and the movement of vehicles to and within the site. The spread of the pathogen is considered likely to be promoted by human activity in Tasmania, as its occurrence in remote wilderness areas is correlated with variables linked to human disturbance, including the presence of gravel roads¹⁷.

The vehicle washdown hygiene protocols adopted in a WDHP will also be effective in minimising the risk of introducing chytrid fungus to the project area, which at this stage is believed to be chytrid free.

6. WEED CONTROL OBJECTIVES

The primary objectives of weed control for the project area and mining lease are:

- (1) Eradication of Class A declared weeds to an extent that conforms to the principles of the *Biosecurity Act 2019* – Spanish heath.
- (2) Containment of Class B declared weeds to an extent that conforms to the principles of the *Biosecurity Act 2019* – Montpellier broom.

To minimise the risk of spread within the project area and mining lease and prevent a breach of the containment principles of the Tasmanian *Biosecurity Act 2019*, it is recommended that targeted primary control of all declared weed species is carried out in autumn and spring 2024 whilst plants are actively growing.

To reduce the number and minimise the risk of spread of environmental weeds within the project area and mining lease, it is recommended that targeted primary control is carried out in autumn and spring 2024 whilst plants are actively growing.

No herbicide should be applied whilst plants are stressed in order to prevent incomplete kill and potentially enable herbicide resistance to develop across the project area. Targeted and well timed primary and follow-up control will greatly reduce the risk of spread as well as further seed being added to the soil seedbank (and subsequent risk of further contamination across the project area).

Follow-up control can then be done for a minimum of the next five years on a biannual basis during spring and autumn when plants are actively growing, targeting seedlings establishing from within the soil seed bank and resprouting individuals previously targeted in the primary control works.

For this Weed and Disease Hygiene Management Plan to enable sustainable, longer term weed management outcomes across the project area, it is essential that ongoing and biannual weed monitoring and control continues beyond the life of this five-year plan.

¹⁷ Pauza *et al.* (2010)

7. WEED MANAGEMENT

This section outlines the methods of primary and follow up treatment for all declared weeds and environmental weeds recorded during the surveys (Table 3). A schedule of weed control and associated costs is outlined in Section 9.

7.1. WEED CONTROL METHODS

In general, control of weeds before a new site is mined and following completion of mining an area will achieve the best longer-term outcomes across the project area and mining lease.

7.1.1. Primary control

Primary control will focus on the treatment of all plants and infested patches within the project area. Treatment involves mechanical removal and targeted spraying.

7.1.2. Follow up control

Follow up control will then largely be focussed on seedlings germinating from the soil seed bank. This includes a maintenance treatment (manual and/ or herbicide) of weed seedlings every 6 months following primary treatment and ideally in spring and autumn following rain when the plants are actively growing. Follow up treatment is required across the project area.

7.1.3. Weed disposal

If required, all woody material and groundcover vegetation comprising WoNS and/or declared weeds should be deep buried under 500 mm of clean soil at a suitable and inactive site where no further soil disturbance will take place. The area must be signed, and entry restricted to ensure the site remains undisturbed.

7.2. HERBICIDES

Only registered herbicides and those listed under an off-label permit issued by the Australian Pesticide and Veterinary Medicines Authority (APVMA) (Permit PER84775) for control of environmental weeds are legally allowed to be used in the control of weeds in Tasmania.

Selective herbicides, with active ingredients such as metsulfuron-methyl, triclopyr, picloram and aminopyralid, are preferable for the control of woody plants, particularly where grassy species are also present, as these herbicides only affect woody plants. Selective herbicides are likely to produce better control results on woody weeds.

Broad spectrum herbicides, with active ingredients such as glyphosate will potentially result in more off-target damage as they will affect all plants. In some cases, for example on weedy grasses such as serrated tussock, they are preferred as they are non-residual. For control sites that are highly sensitive due to their proximity to waterways, control may be restricted to glyphosate products that are registered for use near waterways. Where woody weeds occur along creek lines and in sensitive remnant native vegetation, the cut and paint technique can be used. This technique minimises the risk of off-target damage to surrounding plants.

A qualified Bushcare contractor or weed control operator who holds a current NRE Commercial Operators Licence and NRE Certificate of Competency will know the correct herbicides and rates and will have the appropriate qualifications to legally apply them. By law they must record herbicide usage (see Appendix B Weed Management Record template). This also provides an audit trail to demonstrate annual compliance works were undertaken during the initial five-year period as well as during the subsequent and ongoing post five-year annual monitoring and control period.

The NRE weed website can also provide advice¹⁸. Up to date information should always be sought as products and recommendations can change regularly.

Recommendations for all weed species are outlined in Table 3 These recommendations are based on an expectation that all declared and environmental weeds will need to be treated across the project area and mining lease.

¹⁸ NRE online weed resources are available at: <https://nre.tas.gov.au/invasive-species/weeds>.

7.3. SPECIFIC WEED MANAGEMENT RECOMMENDATIONS

Table 3: Weed Management Recommendations

Species	Current situation	Treatment*	Recommended Timing	Further Advice / Comment
Declared Weeds				
Montpellier broom <i>Genista monspessulana</i>	Recorded along main access route to the project area within mining lease.	<p>Cut and paint or spray plants.</p> <p>Foliar spray: Apply a residual herbicide such as triclopyr or metsulfuron methyl for foliar spraying. Foliage of plants must be sprayed thoroughly by a registered herbicide for effective treatment</p> <p>Cut & Paint: use in regenerating bushland. Cut the shrub off at ground level and paint stump immediately with an undiluted herbicide. Herbicides such as glyphosate 360 are suitable for cut & paint.</p>	spring to early-summer or autumn after rain when plant is actively growing.	<p>Best results when applied to young actively growing plants in fine weather and rain follows a few days later.</p> <p>Avoid mechanical disturbance</p>
Spanish heath <i>Erica lusitanica</i>	Isolated areas in the southwest in <i>Eucalyptus amygdalina</i> bushland and north of the project area within the mining lease.	<p>Cut and paint or spray plants.</p> <p>Foliar spray: Apply a residual herbicide such as triclopyr or metsulfuron methyl for foliar spraying. Foliage of plants must be sprayed thoroughly by a registered herbicide for effective treatment</p> <p>Cut & Paint: use in regenerating bushland. Cut the shrub off at ground level and paint stump immediately with an undiluted herbicide. Herbicides such as glyphosate 360 are suitable for cut & paint.</p>	autumn/ early winter prior to seeding and when plant is actively growing	<p>DO NOT DISTURB AREA</p> <p>No machinery within 50 metres.</p> <p>Mature plants can produce up to 6 million tiny seeds. Be careful not to transport seed to uninfested areas when controlling plants.</p> <p>Treat before seeding.</p>
Environmental Weeds				
cumbungi <i>Typha latifolia</i>	In impoundment on edge of regenerating <i>Eucalyptus ovata</i> bushland between Stage A2 and Stage B as well as along Pioneer Lake foreshore in the mining lease area.	<p>Mechanical removal when area is dry.</p> <p>Apply glyphosate 360 (add surfactant/ wetter suitable for use near water) to actively growing plants at early to full head stage</p>	summer to autumn	<p>Use water safe wetters and surfactants ONLY.</p> <p>Follow up after 4 – 6 weeks if needed.</p>

Species	Current situation	Treatment*	Recommended Timing	Further Advice / Comment
radiata pine (<i>Pinus radiata</i>)	Numerous plants scattered throughout the project area and mining lease more commonly in the south, ranging from small saplings to large mature trees. Priority areas are the active mining sites, rehabilitation areas and 50 meter buffer surrounding these rehabilitation areas to prevent mining operations increasing the pine problem.	Seedlings can be hand pulled or dug out as long as the main root is removed. Larger trees in <u>active mining sites</u> can be cut off at base using a chainsaw OR in <u>rehabilitation areas</u> and <u>50 meter surrounding buffer</u> Drilled & Filled using glyphosate 360 and left in situ to decay. Remove cut trees to a suitable location for burning when safe to do so.	any time	Recruitment from soil seedbank is likely to occur in the following years around larger tree. Follow-up control of all seedlings is essential. Treat before seed cones appear on plants.

* All herbicide selection and application should be in accordance with herbicide labels. Refer to NRE Herbicides for Control for recommended application¹⁹.

Only registered herbicides and those listed under an off-label permit issued by the Australian Pesticide and Veterinary Medicines Authority (APVMA) (Permit PER84775) for control of environmental weeds are legally allowed to be used in the control of weeds in Tasmania.

¹⁹ NRE Herbicides for Control of weed resources are available at: <https://nre.tas.gov.au/invasive-species/weeds>.

8. SITE HYGIENE FOR WEED & PATHOGEN CONTAINMENT

In conjunction with direct weed control, various site hygiene measures must be put in place as complementary methods of weed containment. As no PC or Chytrid fungus were found on site, pathogen management needs be preventative. Note that there is a 2011 record for PC on the western mining lease boundary. The following prescriptions should be followed by all vehicle and machinery operators on site during mining, roading and weed control operations.

Throughout the project areas all personnel should be required to adhere to best practice guidelines:

- *Keeping it clean - A Tasmanian field hygiene manual to prevent the spread of freshwater pests and pathogens*²⁰
- *Weed and Disease Planning and Hygiene Guidelines - Preventing the spread of weeds and diseases in Tasmania*²¹

Earthworks associated with clearance and soil disturbance present a risk of spreading weeds and pathogens onsite. It is recommended the proponent consider the mapped distribution of weeds and PC (2011 record) in relation to their various mining practices as well as ensuring that on-site machinery is kept clean and free of encrusted dirt including clay.

To support on-site hygiene for weeds and pathogens, a dedicated inspection area will need to be located near the main Pioneer Sand Quarry mining lease entrance/ boom gate. All machinery will need to be inspected prior to entering and exiting the facility. Earth moving machinery will be cleaned prior to entering the site and must be inspected to ensure it is free of dirt and weed propagules prior to moving into mining areas. Once on site, road trucks are to remain on the designated main single haul road whilst accessing the mining areas for loading of sand. The use of a compressed air blow down is to be adopted for all machinery when leaving the site. Vehicles and machinery are not to access within 30 meters of the areas infested with Spanish heath and *Phytophthora cinnamomi*.

The following prescriptions should be followed by all workers and contractors on site and when doing any mechanical follow-up weed treatments.

8.1. SOIL MOVEMENT

In order to reduce the likelihood of any weed seeds being moved around or off the site, soil movement must be kept to a minimum during any mining or roading activities.

- Excavated soil from weed infested areas must remain as close as practicable to the spot from where it was removed and deep buried nearby under 500 mm of clean fill. It must not be stored in weed free areas.
- Following mining and roading activities, soil must be returned to as close as practicable to the area it was removed from.
- Soil known to contain weed seed must not be removed from the site unless approval is obtained from the State government under the Tasmanian *Biosecurity Act 2019* or associated *Biosecurity Regulations 2022*.

²⁰ Allen and Gartenstein (2010)

²¹ DPIPW, Stewart and Askey-Doran (2015)

8.2. CLEAN MACHINERY

Any earthmoving machinery and vehicles used in operational areas that contain weeds will potentially accumulate seeds and contaminated soil. In addition, dirty vehicles and machinery entering a site have the potential to introduce new weeds and pathogens to the area. Consequently, a further critical measure to prevent weed spread is that of vehicle and machinery hygiene.

Vehicles and earth moving machinery:

- All vehicles and earth moving machinery are to be cleaned off site.
- The minimum standard for earth moving machinery and vehicle cleanliness is that no weed seeds or propagules and no clods of dirt or loose soil is present after wash-down and that the machine is completely dry prior to coming on site. Check that wheel arches, cab, air cleaner and engine bay (including radiators), as well as buckets and tracks and track frames are free of any seeds or clods of dirt. If the vehicle or machinery does not meet the minimum standard of cleanliness, the supervisor must direct that it be further cleaned before another inspection and prior to entering the site.
- Wash-downs must follow the procedures detailed in the Tasmanian Weed and Disease Planning and Hygiene Guidelines.
- Wash-down checklists for earth moving machinery must be completed for each wash-down (checklists for various machinery are provided in Appendix C).
- All vehicles and earthmoving machinery entering any works, including any mining and/ or roading areas, must be inspected and shown to be clean prior to entering the area and entered into a ledger (Appendix D).

Road trucks:

- A designated inspection and blow-down area must be determined, and a suitable location found near to the entrance boom gate prior to any road trucks or materials entering the mining lease (including project area) to commence civil works or loading of sand.
- A designated blow-down site(s) will be located in accordance with Tasmanian Weed and Disease Planning and Hygiene Guidelines and include a well-drained hard surface. This area will need to be monitored for weeds and diseases for the five year period of this plan and weed/ disease control done on a when found basis.
- The location of blow-down site(s) will be confirmed in consultation with the management and specialists. Once selected this site must be shown on the relevant site plan(s).
- All road trucks will remain on the access single haul road at all times.
- Blow-downs will be recorded in the Ledger (Appendix D).

General:

- The site supervisor/manager (or equivalent personnel) must inspect vehicles and earth moving machinery for cleanliness prior to entering the area. If the machinery meets the standards of cleanliness outlined in the guidelines, the supervisor can authorise its entry and exit and record in a ledger (Appendix D). They will also advise on blow-down requirements prior to exiting the site and record in a ledger
- The site supervisor/manager (or equivalent personnel) must inspect road trucks for cleanliness prior to entering the area and advise on blow-down requirements prior to exiting the site and record in a ledger (Appendix D).

8.3. IMPORTED MATERIALS

Any fill materials to be imported to the site are only to be sourced from suppliers able to provide documentation as to the weeds present at the source. This documentation must be inspected by the

party responsible for importing material. If material is found to be from a location containing weeds other than those weed species listed in Section 4, Table 1, the material must be sourced from elsewhere.

8.4. CONTRACT SPECIFICATIONS

All of the hygiene requirements in Sections 7 and 8 must be specified within the contract conditions of any contractors conducting earthworks on site. They must be included in any resultant Construction and Environmental Management Plans where appropriate.

9. WEED CONTROL SCHEDULE AND ESTIMATED COST

Based on the above objectives and management protocol, the following implementation schedule (Table 4) will guide weed control on site and satisfy legislative and planning requirements and the general biosecurity duty under the *Biosecurity Act 2019*.

Weed works must be documented within a weed management record for audit purposes (Appendix B).

Weed treatment costs are anticipated to be moderate to high in the initial stages of the project. The cost of cutting down the pine trees will depend on whether an 'in-house' person is able and qualified to do the work. The Spanish heath control will be a moderate cost.

The following applies to the weed management schedule and associated responsibilities:

- A weed control program has been identified that covers the project area.
- The responsibility of implementing this plan resides with the owners/ managers.
- If/ when engaged for on-site works, the construction contractor has responsibility for the management of weeds in their area(s) of work from when works approval for their project is given and will cease after the conclusion of any defects liability period they provide to the owners.
- Auditing and reporting are to be undertaken on an annual basis by an independent consultant. If no report is submitted, then the timing of the plan is paused until weed control works recommence.
- The timeframe commences when primary treatment occurs and if no management occurs in any given year, the timeframe for implementing any potential bond is also extended.

9.1. WEED CONTROL SCHEDULE

Table 4: Implementation schedule (excluding radiata pine removal²²)

Timing	Target areas	Actions	Responsible party	Estimated Cost
Entirety of project	Entire Project Area	Hygiene measures All weed contractor and construction contractors must adhere to hygiene measures as specified in Section 6.	Owners / Manager, Weed Contractor, and Construction Contractors	-
ASAP (autumn 2024)	Entire Project Area	Primary control – Year 0 Treat all declared and CLL weeds in the mining lease as per Table 3 in the Weed Management Recommendations in Section 7.	Owners / Manager	\$1,500

²² If in-house staff are unavailable for this work, then obtain a quote from a suitably qualified weed control contractor to carry out primary control work using Drill & Fill. Biannual follow-up will find and cut down all seedlings. Neither of these costs have been included or costed in implementation schedule due to unknown costs.

Timing	Target areas	Actions	Responsible party	Estimated Cost
6 months from primary control	Entire Project Area	Follow up treatment – Year 0.5 (spring or autumn when plants are actively growing) Treat all weeds as per recommendations.	Owners / Manager	\$1,200
1 year after completion of primary control	Entire Project Area	Monitoring – Year 1 <u>Audit</u> and report to the Owners/ Manager.	Owners / Manager Engage an independent consultant to audit control works	\$1,500
1 year after completion of primary control	Entire Project Area	Follow up treatment – Year 1 (spring or autumn when plants are actively growing) Treat all weeds as per recommendations from completed weed audit	Owners / Manager	\$1,000
1.5 years after completion of primary control	Entire Project Area	Follow up treatment – Year 1.5 (spring or autumn when plants are actively growing) Treat all weeds as per recommendations from completed weed audit	Owners / Manager	\$1,000
2 years after completion of primary control	Entire Project Area	Monitoring – Year 2 <u>Audit</u> and report to the Owners/ Manager.	Owners / Manager Engage an independent consultant to audit control works	\$1,500
2 years after completion of primary control	Entire Project Area	Follow up treatment – Year 2 (spring or autumn when plants are actively growing) Treat all weeds as per recommendations from completed weed audit	Owners / Manager	\$800
2.5 year after completion of primary control	Entire Project Area	Follow up treatment – Year 2.5 (spring or autumn when plants are actively growing) Treat all weeds as per recommendations from completed weed audit	Owners / Manager	\$800
3 years after completion of primary control	Entire Project Area	Monitoring – Year 3 <u>Audit</u> and report to the Owners/ Manager.	Owners / Manager Engage an independent consultant to audit control works	\$1,600
3 years after completion of primary control	Entire Project Area	Follow up treatment – Year 3 (spring or autumn when plants are actively growing) Treat all weeds as per recommendations from completed weed audit	Owners / Manager	\$600
3.5 year after completion of primary control	Entire Project Area	Follow up treatment – Year 3.5 (spring or autumn when plants are actively growing) Treat all weeds as per recommendations from completed weed audit	Owners / Manager	\$600

Timing	Target areas	Actions	Responsible party	Estimated Cost
4 years after completion of primary control	Entire Project Area	Monitoring – Year 4 <u>Audit</u> and report to the Owners/ Manager.	Owners / Manager Engage an independent consultant to audit control works	\$1,600
4 years after completion of primary control	Entire Project Area	Follow up treatment – Year 4 (spring or autumn when plants are actively growing) Treat all weeds as per recommendations from completed weed audit	Owners / Manager	\$500
4.5 year after completion of primary control	Entire Project Area	Follow up treatment – Year 4.5 (spring or autumn when plants are actively growing) Treat all weeds as per recommendations from completed weed audit	Owners / Manager	\$500
5 years after completion of primary control	Entire Project Area	Monitoring – Year 5 <u>Audit</u> and report to the Owners/ Manager	Owners / Manager Engage an independent consultant for audit	\$1,700
5 years after completion of primary control	Entire Project Area	Follow up treatment – Year 5 (spring or autumn when plants are actively growing) Treat all weeds as per recommendations from completed weed audit	Owners / Manager	\$400
SUMMARY OF EXPECTED COSTS FOR 5 YEARS CONTROL PERIOD				
Task		Annual Cost		Total Cost
Primary Control		\$1,500		\$1,500
Monitoring		\$1,500-\$1,700		\$7,900
Follow-up control		\$400 - \$1,200		\$7,200
Total				\$16,600

10. REPORTING AND AUDITING

The implementation of the works is to be audited by an independent ecologist or authorised weed management officer. The owners/ manager are to advise the auditor once tasks are completed to ensure that monitoring occurs at the correct intervals following the implementation schedule in Section 9 of this WDHMP.

The following will occur during the auditing process:

- Inspect at the completion of annual weed control works. The Owners / Manager is to brief the auditor on programme including Weed Management Works undertaken (Appendix B), wash down checklists (Appendix C) and washdown ledgers (Appendix D).
- Inspect outcomes of weed control program and advise if additional works are required.
- Each year following audit prepare a report to the Owners / Manager including the following:
 - Report on effectiveness of weed control program

- Remap locations of weeds
 - Provide images showing evidence of weed control
 - Update weed control schedule
 - Confirm areas of responsibility
- Reporting will cease after the five-year period of this Plan.

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- Tasmanian State Government (2019). *Biosecurity Act 2019*. No.22 of 2019. Government Printer, Hobart, Tasmania.
- Tasmanian State Government (2023). Statutory Weed Management Plan (for each declared weed species covered in text). Government Printer, Hobart, Tasmania.

APPENDIX A – WEED SPECIES LIST

Status codes:

ORIGIN

i- introduced

d - declared weed WM Act

Site	Name	Common name	Status
DICOTYLEDONAE			
ASTERACEAE			
7	<i>Cirsium vulgare</i>	spear thistle	i
10 11	<i>Hypochaeris radicata</i>	rough catsear	i
3	<i>Vellereophyton dealbatum</i>	white cudweed	i
ERICACEAE			
7	<i>Erica lusitanica</i>	spanish heath	d
PINACEAE			
1 10	<i>Pinus radiata</i>	radiata pine	i
MONOCOTYLEDONAE			
CYPERACEAE			
5 9	<i>Cyperus eragrostis</i>	drain flatsedge	i
TYPHACEAE			
9	<i>Typha latifolia</i>	great reedmace	i

APPENDIX B – WEED MANAGEMENT RECORD

Date	
Project	
Location	
Name	

For herbicide spray:

Weather	Clear, Sunny	Light Cloud	Heavy Cloud	Showers	Rain
Wind	Nil	Light	Moderate	Strong	Gale
	Direction		Variability		
Temp (°C)	Estimate		Other		
Weed Species Targeted	Growth Stage		Control method	Numbers / Area / Density	
Notes:					
Herbicide Name	1.		2.		3.
Active constituents and strength					
Mix/rate					
Application method					
Amount applied					
Area covered			Time taken		
Signed (operator)					

APPENDIX C – WASH-DOWN CHECKLISTS

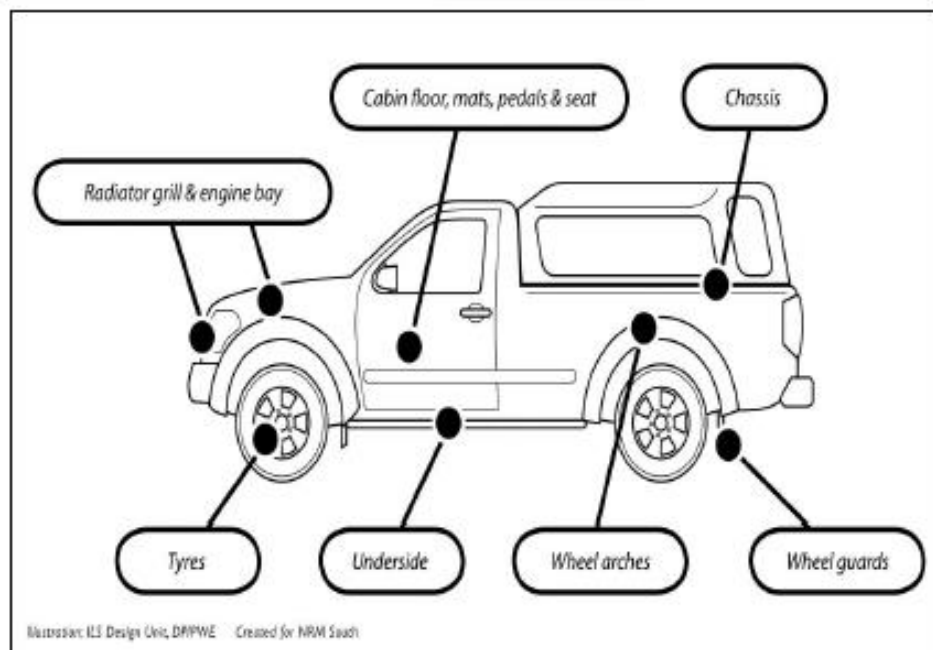
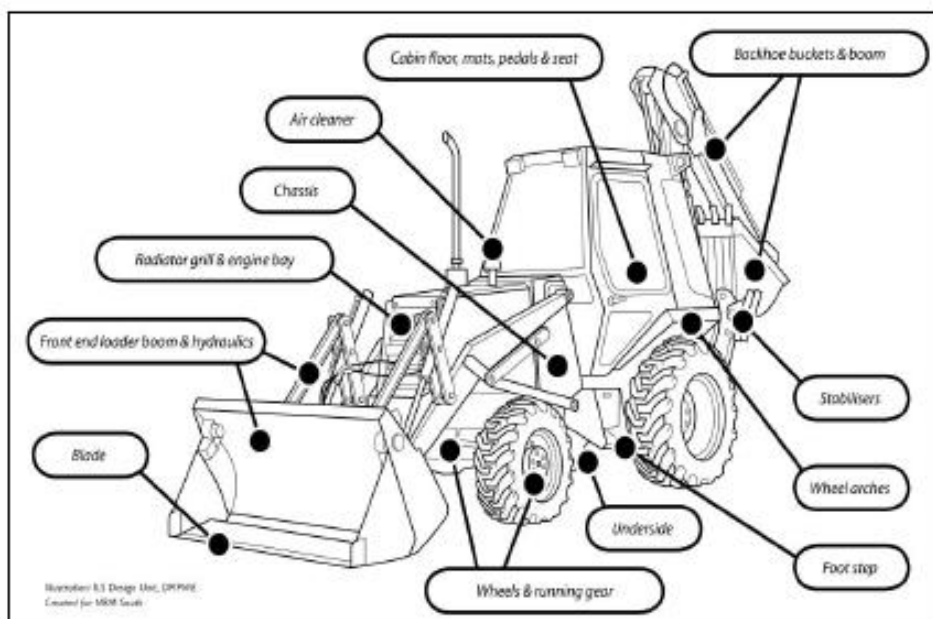
The Tasmanian Weed and Disease Planning and Hygiene Guidelines (DPIPWE 2015) provide the following checklists for various machinery.

Cleandown check lists for specific vehicles and machinery

(Based on:

Far North Coast Weeds (NSW) Machinery and Vehicle cleandown checklist;

Queensland Dept. Natural Resources - Queensland checklist for Inspection Procedures)



Examples of cleaning points - Excavator and 4wd (source: Keeping it Clean manual)

CLEANING/INSPECTION LIST FOR UTILITY/4WD				
Date:		Site:		
Vehicle:		Registration/ID:		
Area	Contamination point	Inspected	Cleaned	Method
Engine bay	Front grill			
	Radiator and other cooling cores or fins			
	Grill or recess under wipers			
	Engine mounts			
	Top of gearbox			
	Battery recess/tray			
	Any recesses on engine or manifold			
	Air cleaner (including element)			
Cabin	Footwells			
	Carpets and mats			
	Seats			
	Tool boxes			
	Air vents			
Wheels and arches	Tyre treads			
	Rims and wheel caps			
	Wheel arches			
	Mud flaps and brackets			
	Brakes			
Tray	Body of tray (especially any recesses)			
	Mats and toolboxes			
	Around fuel tank caps			
Under carriage	Chassis rails			
	Struts and stabilisers			
	Steering components			
	Axels and differentials			
	Spare tyre and mounts			
	Guards			
	Fuel Tank			
Attachments	Bull bar			
Cleaning method: Mechanical (M), Compressed Air (CA), Vacuum (V), High Pressure Water (HPW), Low Pressure Water (LPW)				
Inspected by:		Signature:		
Cleaned by:		Signature:		

CLEANING/INSPECTION LIST FOR AN EXCAVATOR				
Date:		Site:		
Vehicle:		Registration/ID:		
Area	Contamination point	Inspected	Cleaned	Method
Engine bay	Engine bay floor			
	Fan shroud and radiator cores			
	Air filters (shake/tap filters to determine if clean)			
	Glacier plate (near radiator)			
Cabin	Footwells			
	Carpets and mats			
	Seats			
	Tool boxes			
	Air vents			
Excavation body	Hollow section chassis channels			
	Channels for hydraulic hoses from driven motor			
	Counterweight void spaces			
	Removable track adjuster guards and lubrication points			
	Turret pivot area			
	Arms/booms - pivot points			
Bucket/Blade	Between teeth of adapters			
	Wear plates			
Rear blade (Stabiliser)	Wear plates			
	Hollow section arms			
	Hollow section blade			
Cleaning method: Mechanical (M), Compressed Air (CA), Vacuum (V), High Pressure Water (HPW), Low Pressure Water (LPW)				
Inspected by:		Signature:		
Cleaned by:		Signature:		

CLEANING/INSPECTION LIST FOR TRACK TYPE DOZERS				
Date:		Site:		
Vehicle:		Registration/ID:		
Area	Contamination point	Inspected	Cleaned	Method
Engine	Check radiator core and engine area for residues.			
	Remove and check the air filter/cleaner (these often require destruction where they are clogged with QRM).			
	Check carefully the void space between the oil and radiator cores.			
	Battery Box - Lift/remove the battery to check for contamination (battery box may be at side/rear or under seat).			
Drivers cab	Check externally under and around driver's cab.			
	Check under mats in cab.			
	Remove/lift seat; remove/lift floor pans to allow checking to top of transmission.			
	Check air conditioner filter (if fitted) – shake/tap filter to check if clean			
	Check externally under and around driver's cab.			
	Check under mats in cab.			
Body	Belly plates should be removed to allow inspection and cleaning			
	Rear plates at back of dozer should be removed to allow inspection and cleaning.			
	Hydraulic cover plates should be removed to allow inspection and cleaning.			
Tracks/track frame	Examine tracks carefully.			
	Ensure inspection/cover plates are removed to allow inside track area.			
	Check idler wheels (these support the tracks).			
Fuel cells	Are removable therefore dirt etc can pack between the tank and the frame.			
Blade	Ensure that edge of blade top/bottom is not split – this allows soil to be packed very tightly in the hollow.			
	Check cutter points/wear blades.			
	Check carefully the pivot points and adaptors at the rear of the front blade – these allow the blade to change height and angle. Sometimes soil has compacted and is difficult to dislodge.			

Area	Contamination point	Inspected	Cleaned	Method
	Check trunction arms			
	Check all hollow sections			
Ripper support frame is usually hollow	Check carefully if any contaminants have entered this section. The tynes may need to be removed.			
Tynes	Tynes need careful inspection. Contamination may often be removed by water blasting, but tynes may need to be removed in some cases.			
Ripper points	A pin holds on the ripper points. Dirt can compact under the ripper points.			
All areas	Check if any sections or channels are hollow and determine if there is a possible entry point for contamination. Check if plates are covering a compartment or space that may have collected dirt/trash.			
Cleaning method: Mechanical (M), Compressed Air (CA), Vacuum (V), High Pressure Water (HPW), Low Pressure Water (LPW)				
Inspected by:		Signature:		
Cleaned by:		Signature:		

[illegible]

CLEANING/INSPECTION LIST FOR DUMP TRUCKS				
Date:		Site:		
Vehicle:		Registration/ID:		
Area	Contamination point	Inspected	Cleaned	Method
Engine and running gear	Air cleaner			
	Air conditioner unit			
Cabin	Footwells			
	Carpets and mats			
	Behind and under seats			
	Tool boxes			
	Air vents			
Body	Hollow channels in tray frame			
	Between dual wheels (where applicable)			
Cleaning method: Mechanical (M), Compressed Air (CA), Vacuum (V), High Pressure Water (HPW), Low Pressure Water (LPW)				
Inspected by:		Signature:		
Cleaned by:		Signature:		

