

DRAFT REPORT

ST DIZIER TIN DEPOSIT. EL: 46/2003

PROPOSED OPEN PIT MINE

FLORA & FAUNA HABITAT SURVEY

For STELLAR RESOURCES LTD

18^h June 2014



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1.0 Introduction:

Stellar Resources Ltd is proposing to develop an open pit mine for tin within EL:46/2003 the area known as St Dizier near the Heemskirk Road between Zeehan and Granville Harbour.

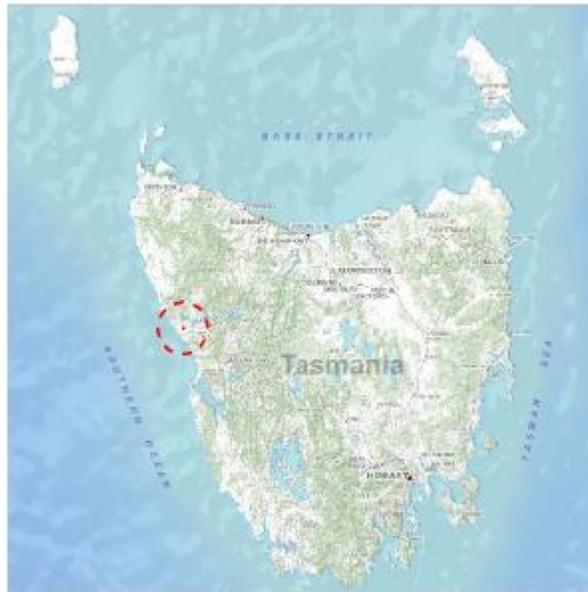
A flora and fauna habitat survey is required of the proposed open pit site and the surrounding area as part of the EPA license conditions in order to determine any likely impacts on threatened species or threatened vegetation communities and threatened fauna habitat. A survey for the presence of Tasmanian Devils and potential den sites within the target area is required as part of the survey.

Access will be via existing 4WD tracks from the Heemskirk Road and these tracks extend through the target area.

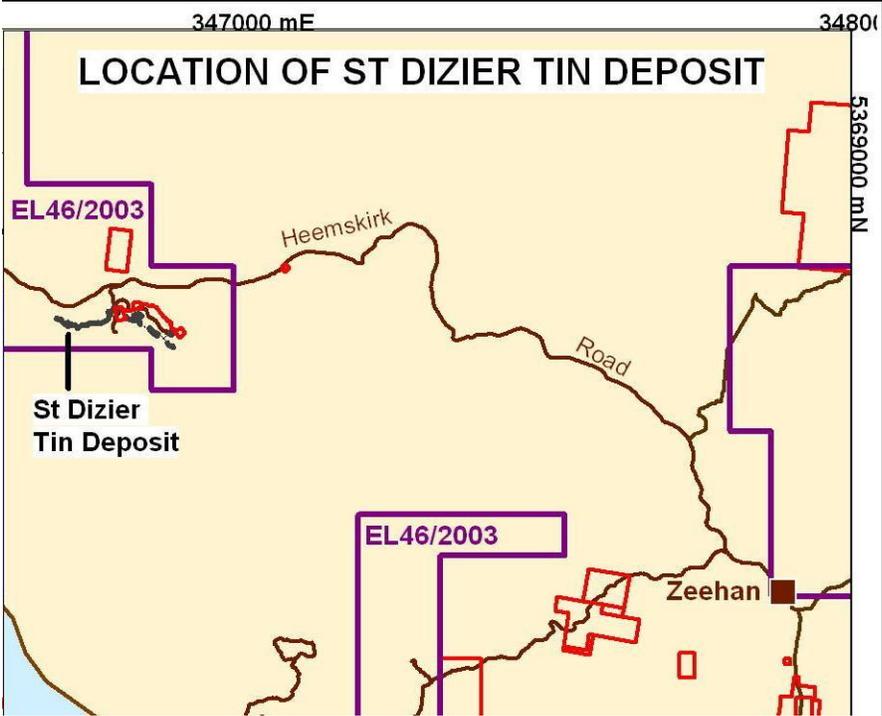
1.1 Objectives: The objectives of this survey were to:

- Undertake a desktop survey to confirm the known biological records and the natural values present in the proposed mine site and target area and in the vicinity.
- Undertake a field survey of the proposed open pit area and surrounds to observe and record the natural values present including the vegetation types and plant communities, the flora and in particular any threatened species, and potential habitat for threatened species of fauna.
- Survey the target area for potential den sites of Tasmanian Devils and for other evidence of the species presence.
- Determine the possible impacts of the proposed open pit mine on the natural values present and make recommendations on how those impacts can be minimised.

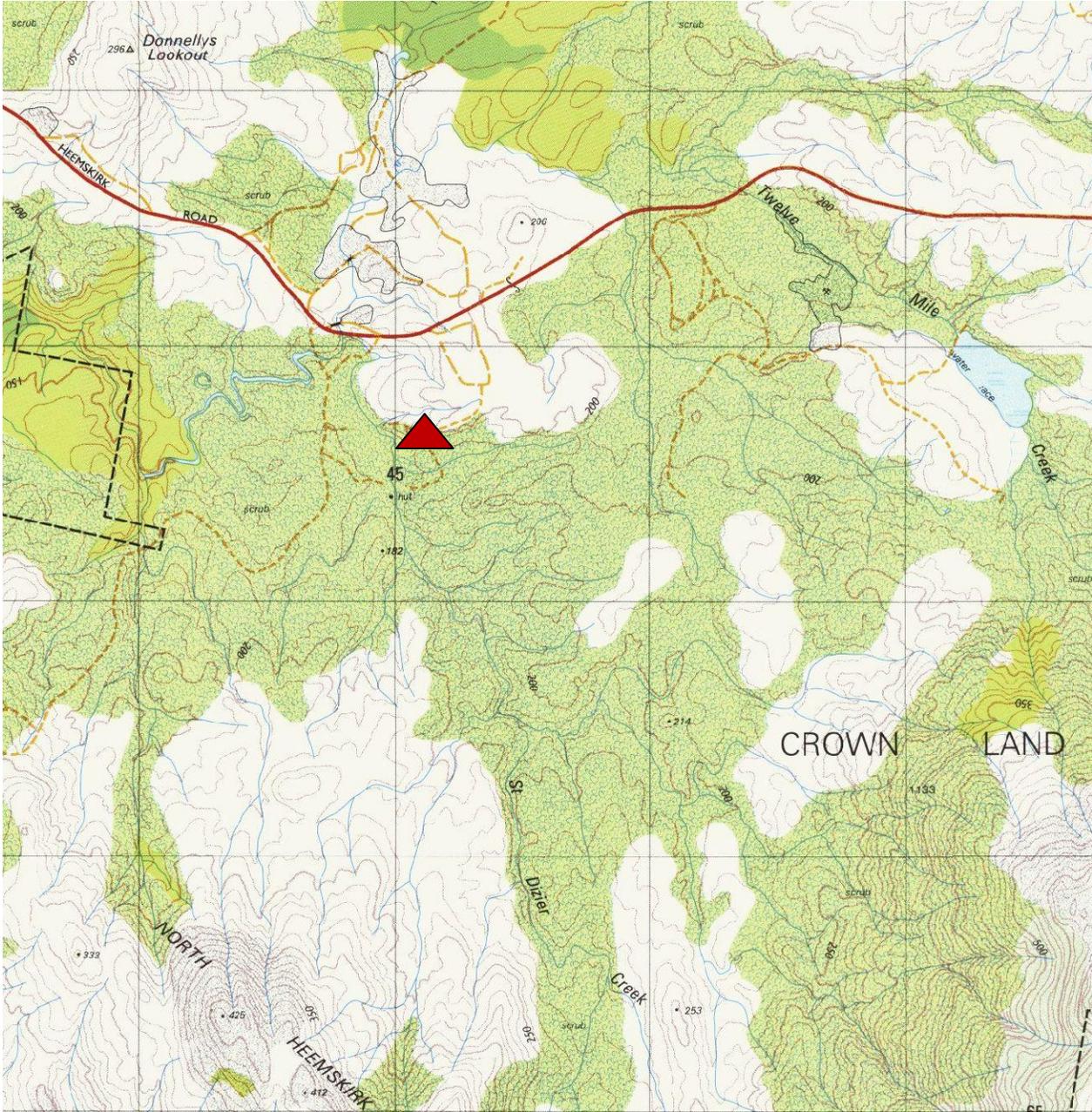
1.2 Location of Study Area:



MAP REF: Tasmap 1:25,000 Heemskirk, 3436
BIOREGION: West
GRID REFERENCE: 345250E – 5367750N
(All grid references MGA Zone 55 GDA94)



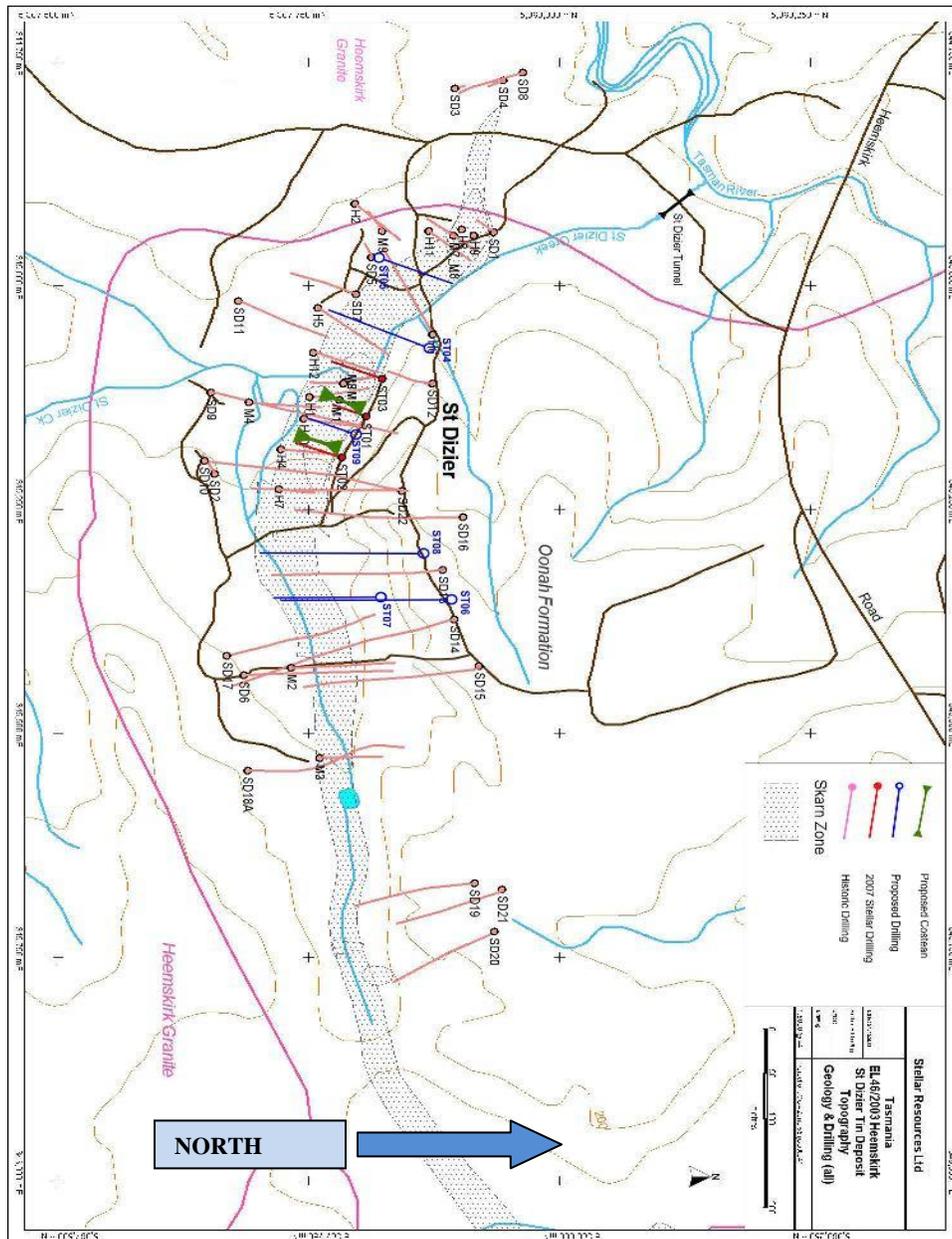
MAP No.1. Location of St Dizier survey area within EL/46/2003 north-west of Zeehan. .



MAP No.2. St Dizier survey area, TasMap 1:25,000 Heemskirk Sheet 3436. .

1.3 Site Description:

The St Dizier survey and target area is located on the rolling hills of mainly low vegetation to the immediate south of the Heemskirk Road between Zeehan and Granville Harbour and about 20km from Zeehan. The survey area is located within the catchment of the Tasman River and St Dizier Creek which extends through the survey area flows into the Tasman River about 500 metres to the north-west of the site. A number of minor creek-lines, mostly tributaries of St Dizier Creek also extend through the target area. The Tasman River flows directly into the Southern Ocean about 3km to the south of Granville Harbour. The site and survey areas were accessed from existing 4WD tracks which extend from the Heemskirk Road.



MAP No.3. St Dizier target area and drill site locations .

2.0 Desktop Survey of Natural Values:

The DPIPWE database “The Natural Values Atlas” was accessed for the known biological records of the St Dizier locality and environs. Records of threatened species of flora and fauna known to occur within a 5,000 metre radius of the location were also accessed. Data sourced included the vegetation types and plant communities, the occurrence of any threatened vegetation communities, the recorded locations of any threatened species of plants and threatened fauna known or expected to occur in the vicinity. Occurrences of environmental weeds, the reserve status of the area and the known geo-conservation values were also accessed.

REFERENCE POINT for the locality: GRID REF 345250E – 5367750N

2.1 Desktop Survey Results:

VEGETATION COMMUNITIES:

The following vegetation communities are mapped under the TASVEG mapping program as occurring within 1,000 metres of the study area reference point.

VEGETATION COMMUNITY	TasVeg Code / Map colour	EXTENT IN STUDY AREA
<i>Nothofagus – Phyllocladus</i> Short Rainforest	RMU / Dark blue	Along creek-lines to the west of the reference point.
<i>Eucalyptus nitida</i> Wet Forest (undifferentiated)	WNU / Medium blue with horizontal lines	Along the ridge and upper slopes to the south of the reference point.
Western Wet Scrub	SWW / orange with “z”	A single patch to the immediate west of the reference point.
<i>Leptospermum</i> Scrub	SLW / Pink with diagonal yellow lines	Numerous small scattered patches across the study area but mainly within the Buttongrass Moorland.
Buttongrass Moorland (undifferentiated)	MBU / Yellow with horizontal lines	The most widespread community across and surrounding the study area.

TABLE 1: Vegetation communities as mapped under the TASVEG mapping program within 1,000 metres of study area reference point.

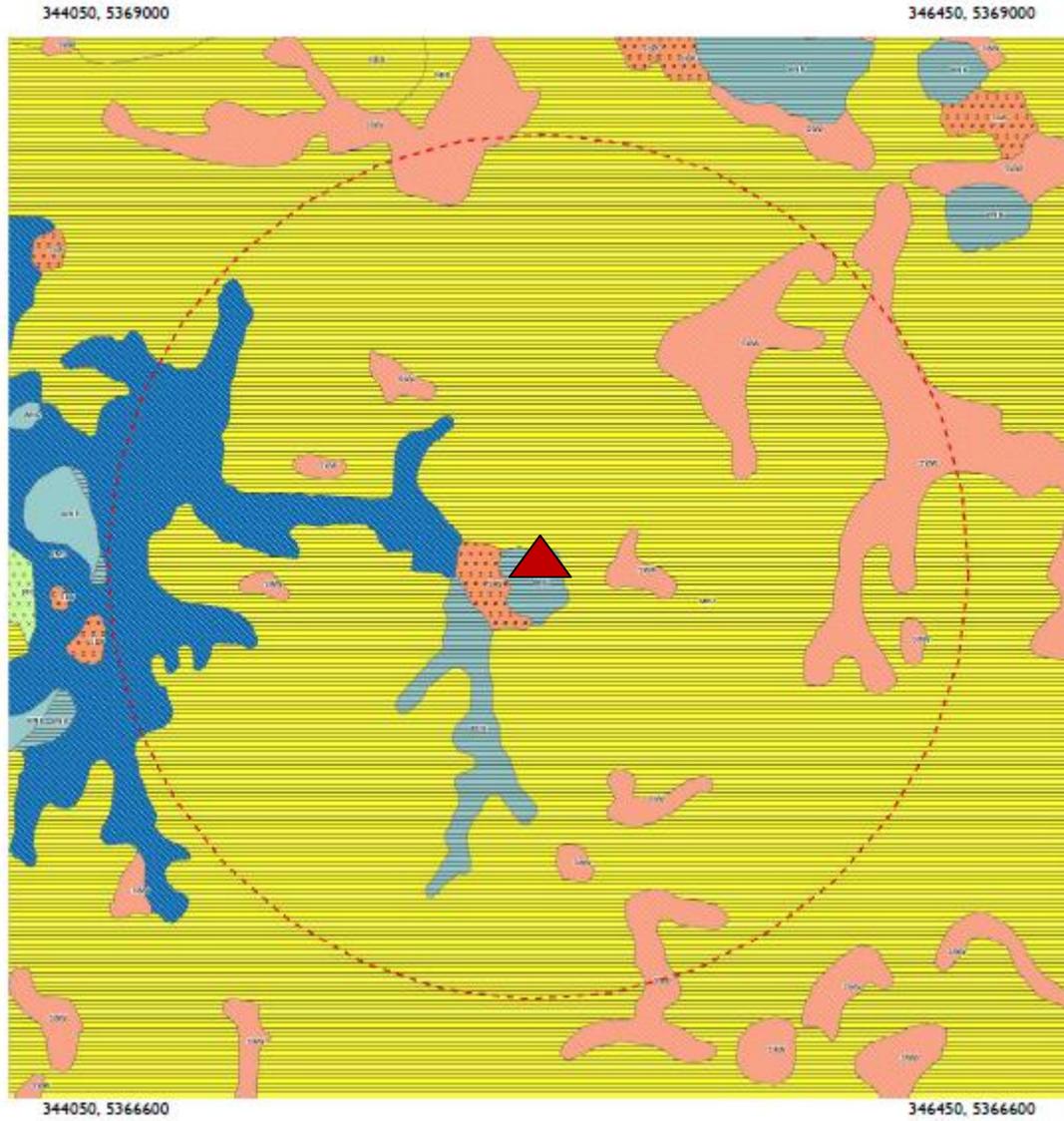


FIGURE 1: Vegetation communities as per TASVEG mapping program within 1,000 metres of study area reference point

CODE:

-  **RMU** *Nothofagus – Phyllocladus* Short Rainforest
-  **WNU** *Eucalyptus nitida* Wet Forest (undifferentiated)
-  **SWW** Western Wet Scrub,
-  **SLW** *Leptospermum* Scrub.
-  **MBU** Buttongrass Moorland (undifferentiated)

THREATENED VEGETATION COMMUNITIES:

None of the vegetation communities which are mapped as occurring in the study area are listed as threatened under the Tasmanian *Nature Conservation Act 2002* or the Commonwealth *EPBC Act 1999*.

VEGETATION COMMUNITIES OF CONSERVATION SIGNIFICANCE:

- *Nothofagus- Phyllocladus* Short Rainforest (RMU) is widespread in the west of the State however it is under-reserved in some bioregions and particularly so in its old-growth condition.
- *Eucalyptus nitida* Wet Forest (WNU) is considered to be well reserved in west of the state.
- *Leptospermum* Scrub (SLW) in its many forms is widespread and found across the state.
- Western Wet Scrub (SWW) is an abundant community in western Tasmania from sea level up to 750m.
- Buttongrass Moorland (MBU) is a widespread and abundant community in western Tasmania.

THREATENED FLORA:

No species of threatened flora which are listed under the Tasmanian *Threatened Species Protection Act 1995* and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* are recorded on the “Natural Values Atlas” database as occurring within 5,000 metres of the St Dizier reference point.

THREATENED FAUNA:

Two species of threatened fauna listed under the Tasmanian *Threatened Species Conservation Act 1995* and /or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* are recorded on the “Natural Values Atlas” database as occurring within 500 metres of the study area reference point.

- The Tasmanian Devil *Sarcophilus harrisii* is listed as being endangered under both State and Commonwealth Acts due to the severe decline of the species as a result of the disease DFT with the disease front now extending into western Tasmania.
There is a single sight record on the database about 500 metres to the north-west of the reference point, adjacent to the Heemskirk Road and near to the Tasman River bridge.
It is a recent record which is dated from 2013.
- Wedge-tailed Eagle *Aquila audax* subsp *fleayi*. The Tasmanian subspecies is listed as being endangered under both State and Commonwealth Acts. The birds require large trees within tracts of (over 10ha in area) old-growth forest for nesting and are very sensitive to disturbance during the breeding season.
There is a single sight record on the database dated 2001.
There is also a second sight record dated 1999 from within 2,000 metres. There are no nest records on the database from within 2,000 metres.

There are further records of the above threatened species listed on the database as occurring from between 2,000 and 5,000 metres of the study reference point.

- Tasmanian Devil with 40 records dated from between 2005 and 2012 from along the Heemskirk Road and the Granville Harbour Road. These records presumably resulting from the formal monitoring program for the Devils on the West Coast.
- Wedge-tailed Eagle with a further 5 sight records, all dated from 2001. There are no nest records on the database from within 5,000 metres.

There is one further species of threatened fauna recorded on the database from between 2,000 and 5,000 metres.

- White-bellied Sea-eagle *Haliaeetus leucogaster*. The species is considered to be vulnerable in Tasmania. There are two sight records, all dated from 2001. There are no nest records on the database from within 5,000 metres.

The following six species of threatened fauna could occur in the locality based on habitat mapping and the known geographical range of each.

- Spotted-tailed Quoll *Dasyurus maculatus* subsp *maculatus* is listed as being rare in Tasmania and vulnerable nationally.
- Swift Parrot *Lathamus discolor* is recognized as an endangered species in Tasmania and nationally. The species usually associates with *Eucalyptus globulus* and *Eucalyptus ovata* forest for feeding and requires old-growth trees with hollows for nesting.
- Azure Kingfisher *Ceyx azureus* subsp *diemensis*. The Tasmanian subspecies is listed as being endangered under both State and Commonwealth Acts. It is a riparian species which is known to occur along the rivers of the state's west coast.
- The Tussock Skink *Pseudemoia pagenstecheri* is a grassland species which is considered to be vulnerable in Tasmania. It inhabits some types of native grasslands.
- Australian Grayling *Prototroctes mareana* is a native fish which moves between fresh and salt water localities. The species is listed as being vulnerable both in Tasmania and nationally. The Tasman River which flows directly into the southern ocean has the potential to be important habitat for this fish.
- The Striped Marsh Frog *Limnodynastes peroni* is endangered in Tasmania and occurs mainly in large swamps in the far north-west of the state.

NON-THREATENED FAUNA OF CONSERVATION SIGNIFICANCE;

The following two species of non-threatened fauna have been recorded on the NVA database from within 5,000 metres of the study area and potential habitat for both species is present in the study area.

- Wombat *Vombatus ursinus*. There are four records on the database, all dated 2001 to 2002 and located between this area and the coastline. Although not listed as a threatened species the Wombat is considered to be in decline across its range in Tasmania.
- Ground Parrot *Pezoporus wallicus*. There are 9 records on the database, all dated between 2001 and 2002 and all located between this area and the coastline. Buttongrass and Heathland vegetation is potential habitat for the Ground Parrot. Tasmania is the stronghold for this species, where it is believed to be relatively common in suitable habitats, however the species is threatened on the Australian mainland due to loss of habitat.

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ENVIRONMENTAL WEEDS:

The following environmental and declared weeds are recorded on the database as occurring within 5,000 metres of the study area reference point.

- *Erica lusitanica* is a weed of national significance (WONS) and is widespread in the near coastal areas of the west coast. It is spread along road verges by roadside slashing and is common along the adjacent verges of the Heemskirk Road with 2 records within 500 metres and 22 records within 2,000 metres.

GEOCONSERVATION VALUES:

The NVA records a significant Early Eocene plant macrofossil site about 200 metres to the south south-east of the study area reference point. It is listed as having local and global significance.

The balance of the area is recognized as being within the most extensive organosol terrain in Australia and the Southern Hemisphere and is known as the Western Tasmanian Blanket Bogs.

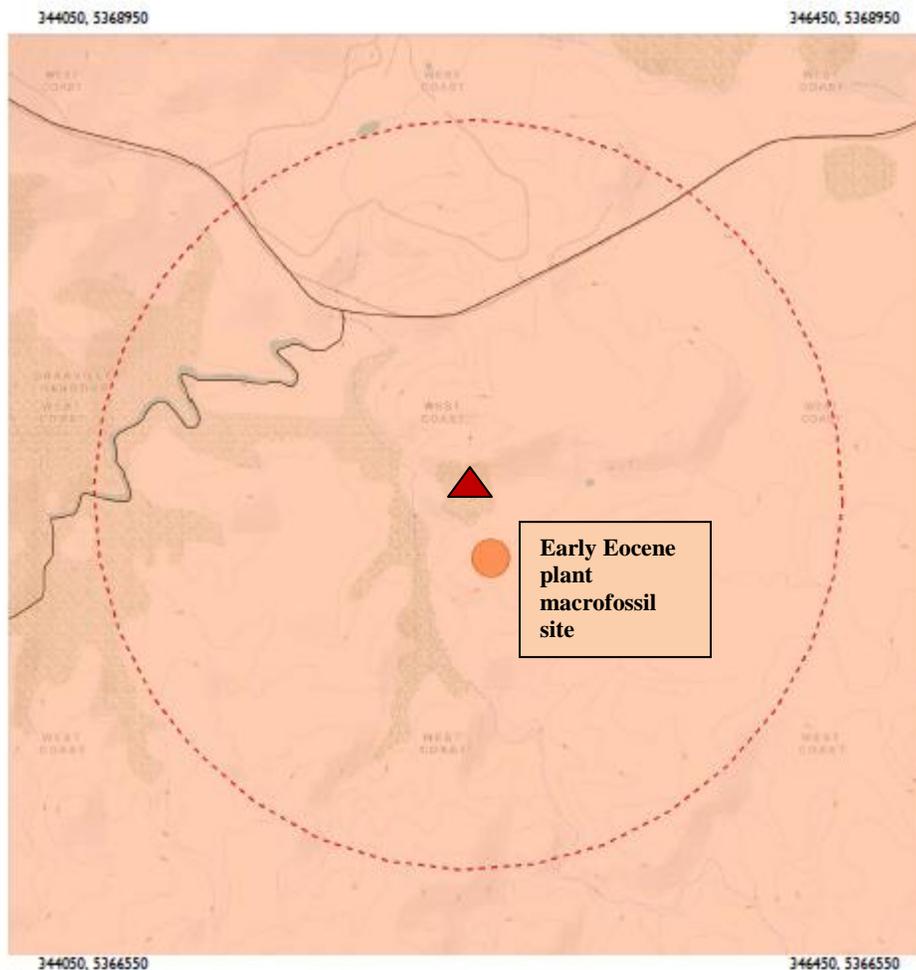


FIGURE 2: Geoconservation values and sites recorded within 1,000 metres of the study area reference point.

RESERVE ESTATE:

The study area is located within the Mount Heemskirk Regional Reserve as detailed on the following map sourced from the Natural Values Atlas database.

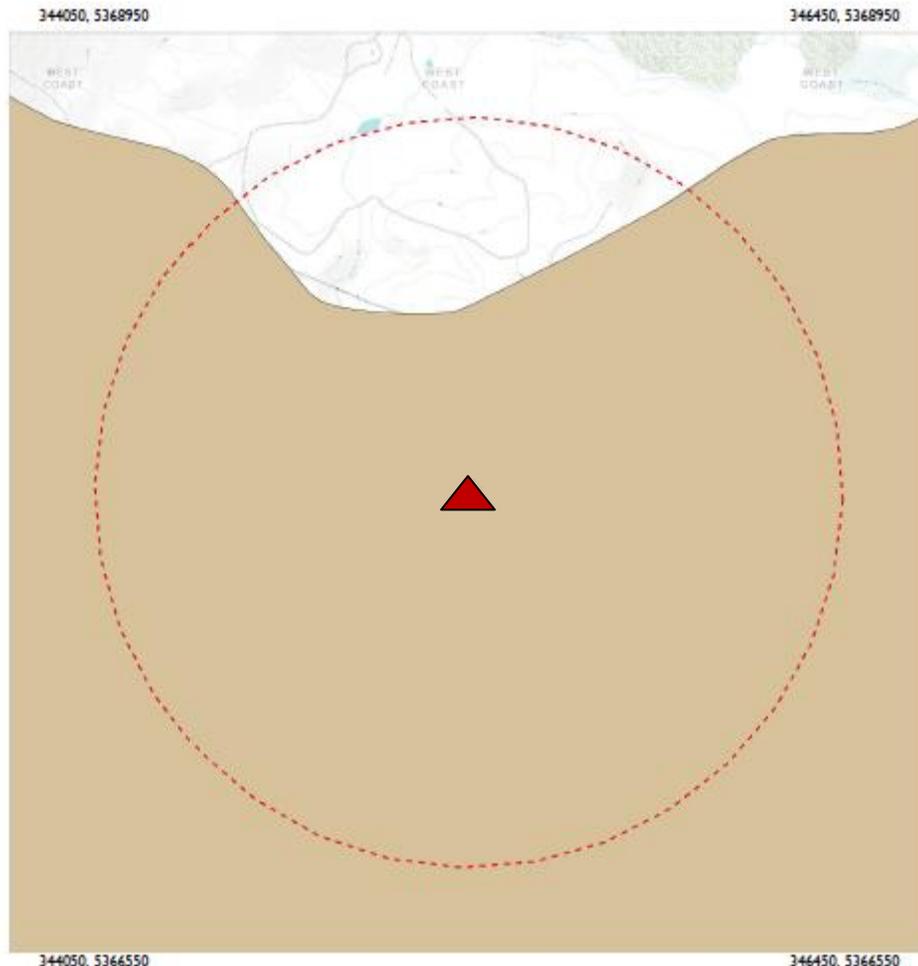


FIGURE 3. Mount Heemskirk Regional Reserve boundary in relation to the the study area reference point and within 1,000 metres.

3.0 Field Survey:

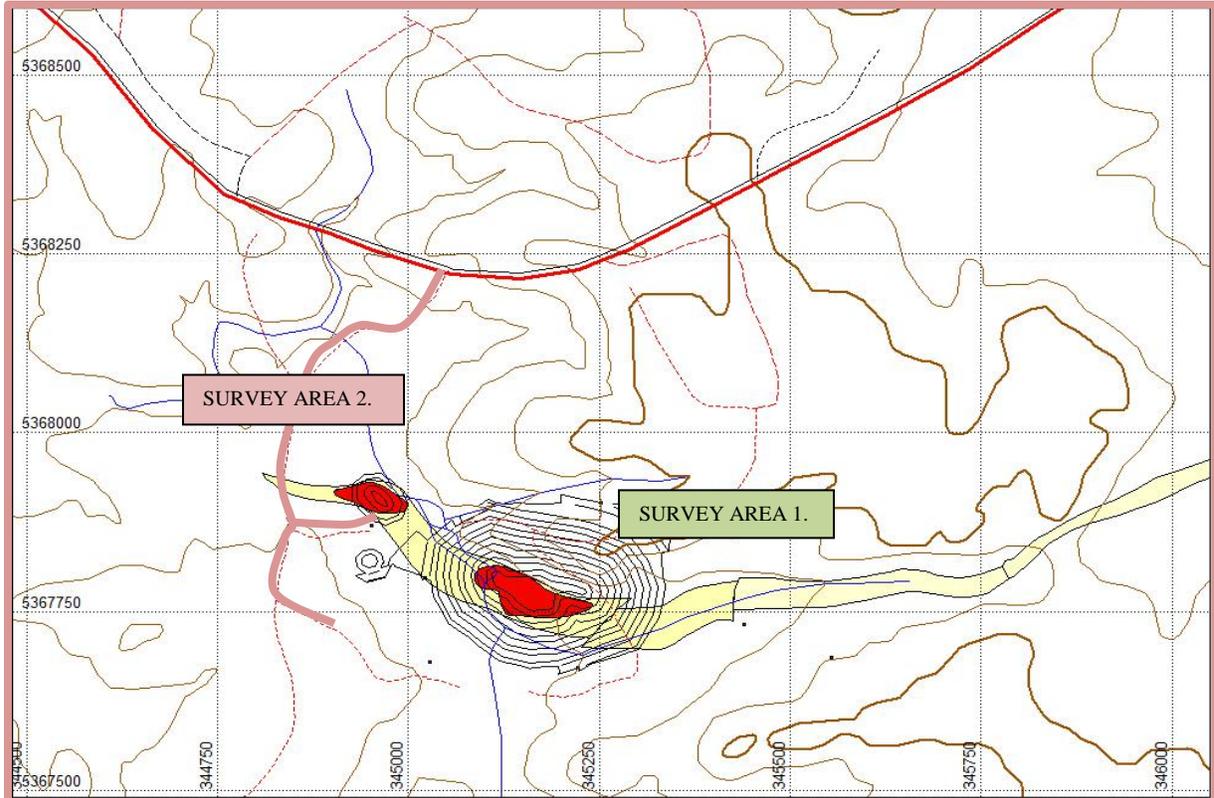
The field survey was undertaken on Tuesday 6th May 2014.

Methodology: The field survey No.1 of the proposed the target area, the proposed open pit site and the surrounding area was undertaken on foot and accessed from the existing 4WD tracks in the locality. The 4WD track which commences from the Heemskirk Road and follows the valley of the St Dizier Creek to the south was also surveyed for a distance as Survey Area No.2.

Vascular plant species were recorded, vegetation communities were observed and cross-referenced with the TASVEG map sourced from the Natural Values Atlas database. Evidence of the presence of threatened fauna, specifically the Tasmanian Devil was also surveyed along with likely habitat for the threatened species either known or with potential to occur in the locality.

Limitations: This survey was conducted in late autumn prior to the flowering of many species. No botanical survey can guarantee that all flora will be observed and recorded in a single survey in one

year due to seasonal and annual variation in abundance and the possible absence of flowers and fertile material for identification. Ephemeral species which may have been present includes species of orchids, lilies, herbs grasses and other graminoids. However all significant species known to occur in the study area and environs have been considered in this report.



MAP No.4: Proposed open pit mine site and survey locations.

Target Area Details:

SURVEY AREA 1: Proposed mine site area, proposed open pit and surrounds.

SURVEY AREA 2: Track running north to south to the west of St Dizier Creek commencing from the Heemskirk Road (near the Tasman River bridge).

3.1 Field Survey Results:

SURVEY AREA No.1:

The field survey followed the existing 4WD tracks which extended through the St Dizier target area and the area proposed for the open pit mine as detailed on Map No.4. above.

VEGETATION COMMUNITIES:

The area defined as Buttongrass Moorland (MBU) on the TASVEG map, Figure 1. on page 8 can be further defined as Western Buttongrass Moorland (MBU). Typically in Western Buttongrass Moorland, Buttongrass itself is less dominant than in other forms of Buttongrass Moorland where it usually comprises less than 25% of the vegetation cover, the balance being made up of shrubby heathland species and other species of sedges. The overall appearance is of a heathland type of

vegetation rather than Buttongrass Moorland particularly on the hill slopes and crests. The Buttongrass was less frequent on the lower slopes where it tended to grade into a Wet Heathland (SHW) type of vegetation although this vegetation was more prevalent in Survey area No.2 which was less elevated. Soakage areas and the upper sections of creek-lines within the Western Buttongrass Moorland contained pockets of *Leptospermum* Scrub (SLW), mainly low scrub of predominantly Manuka *Leptospermum scoparium* and/or *Melaleuca squarrosa*.

Narrow corridors of low *Eucalyptus nitida* Forest followed the creek-lines and along the lower valleys and this community typically had an understorey composed of a much taller *Leptospermum* Scrub with some rainforest understorey species such as Tasmanian Laurel *Anopterus glandulosus* being present in more enclosed locations. Patches of tall *Leptospermum* Scrub (SLW) was also present around the periphery of the Eucalypt community in some locations and sedges such as *Baloskion tetraphyllum* was common along the edges of the creeks. This Eucalypt community also covered most of the southern facing slopes of the area proposed for the open pit mine.

The area as a whole appears to have been subjected to a relatively frequent firing regime and as a consequence few if any old-growth Eucalypts were present within these corridors of wooded vegetation.

The areas mapped by TASVEG as *Eucalyptus nitida* Wet Forest on Figure 1. can therefore be further defined as *Eucalyptus nitida* Wet Forest over *Leptospermum* (WNL) which is a widespread community in western Tasmania.

No rainforest vegetation community was observed during the survey of Area No.1.

THREATENED VEGETATION COMMUNITIES:

No vegetation community listed as threatened under the Tasmanian *Nature Conservation Act 2002* was observed during the field survey.

THREATENED FLORA:

No plant species listed under the Tasmanian *Threatened Species Conservation Act 1995* and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* was observed or recorded during the field survey.

There is some potential for species of orchids to occur in the Buttongrass and Heathland vegetation communities observed in the locality including a number of threatened species, however there are no previous recordings on the NVA and no orchids were observed during this survey as it is outside of the flowering season for most species of orchids.

THREATENED FAUNA:

No species of threatened fauna which are known to occur or have the potential to occur in the locality were observed during the survey. No evidence of the presence of Tasmanian Devils or Spotted-tailed Quolls were observed in survey area No.1 but it is considered likely that one or both species frequent the area at times, particularly as devil scats were observed in the nearby Survey Area No.2. (see below)

THREATENED FAUNA HABITAT:

No potential habitat for the threatened species of fauna referred to in the desktop survey section of this report was observed during the survey. No potential den sites for Tasmanian Devils or Spotted-tailed Quolls were observed as there was an absence of old-growth trees with hollows or large hollow logs in the survey area. No potential nest trees for Wedge-tailed Eagles or White-bellied Sea-eagles were

observed during the survey also because of an absence of old-growth Eucalypts, and the lack of larger patches of mature forest.

The nearby Tasman River is likely to present suitable habitat for the Azure Kingfisher and the Australian Grayling and stringent measures will be needed to ensure there is no contamination of St Dizier Creek during the mining operation which could impact on the river and riparian habitat along the Tasman River for those two species. There were no significant wetlands in the survey area as potential habitat for the Striped Marsh Frog. No grasslands suitable for the Tussock Skink were present in the locality. The two species of Eucalypt present in the locality are not favoured food trees of the Swift Parrot and no old-growth Eucalypts with significant hollows which may provide nesting habitat was observed during the survey and therefore the bird is unlikely to be present.

TASMANIAN DEVIL *Sarcophilus harrisii*:

No evidence of the presence of Tasmanian Devils such as scats or tracks were observed in Survey Area No.1. or in the vicinity of the proposed open pit mine.

No dens or potential den sites were observed due to the absence of old-growth trees with significant basal hollows or large hollow logs.

It is likely however that the area is part of the home range of one or more individual Devils as evidence of the Devil's presence was observed in the nearby Survey Area No.2. (see below)

NON-THREATENED FAUNA OF CONSERVATION SIGNIFICANCE:

- Wombat *Vombatus ursinus* Evidence of Wombats was not observed in Survey Area No.1, however the animal is present in the wider locality as scats were observed in Survey Area No.2.
- Ground Parrot *Pezoporus wallicus*. The Buttongrass and Wet Heathland vegetation observed within the survey area is potential habitat for this bird. No birds were observed during the survey however.

ENVIRONMENTAL WEEDS:

No environmental weeds were observed within the areas surveyed.

PHYTOPHTHORA:

There was no symptomatic field evidence observed of the root pathogen *Phytophthora cinnamomi* during the field survey of Area No.1.

3.2 Field Survey Results:

SURVEY AREA No.2:

The second survey followed the 4WD track which extends from the Heemskirk Road just east of the Tasman River Bridge towards the south. The track crosses St Dizier Creek then follows the wide open valley of the creek to the west of the target area and proposed mine site.

The survey route is detailed on Map No.4.

VEGETATION COMMUNITIES:

The vegetation which extends through most of this survey area is described as Wet Heathland (SHW) which has a similar composition of plant species to vegetation in survey area No.1. but in the heathland there is very little Buttongrass present and more Swamp Honey Myrtle *Melaleuca squamea* and Pink Swamp Heath *Sprengelia incarnata* which tends to predominate in wetter locations.

Leptospermum Scrub and *Eucalyptus nitida* Wet Forest with a *Leptospermum* understorey extended along the lower reaches of St Dizier Creek which was also observed to be typical of the wider locality. Tassel Cord Rush *Baloskion tetraphyllum* and *Bauera rubioides* were also observed to be common along the creek-line.

THREATENED VEGETATION COMMUNITIES:

No vegetation community listed under the Tasmanian *Nature Conservation Act 2002* or the Commonwealth *EPBC Act 1999* was observed in Survey Area No.2.

THREATENED FLORA:

No species of threatened flora listed under the Tasmanian *Threatened Species Protection Act 1995* or the Commonwealth *EPBC Act 1999* was observed in the survey area.

Wet Heathland vegetation is potential habitat for a number of species of orchids, including some threatened species. There were no previous records however of threatened species of orchids on the Natural Values Atlas within 5,000 metres of the locality.

THREATENED FAUNA:

No species of threatened fauna were observed during the survey, however evidence of the presence of Tasmanian Devils *Sarcophilus harrisii* (scats) was observed along the survey track although none were considered to be fresh. (see below)

THREATENED FAUNA HABITAT:

No old-growth trees with basal hollows or large hollow logs which may present den opportunities for Tasmanian Devils or Spotted-tailed Quolls, *Dasyurus maculatus* subsp *maculatus* were observed during the survey. The lower valley slopes and the Tasman River valley appear to be part of the home range of one or more individual Devils and as they are known to travel up to 20km in a night they would very likely roam over the entire survey area at times. It is also likely that their dens are remote from the proposed mine site given the lack or absence of suitable hollows in old-growth Eucalypts or large logs.

No old-growth Eucalypt forest was observed in this survey and no large remnant trees, therefore there was no suitable nesting habitat in the location for the Wedge-tailed Eagle.

No potential habitat was observed during Survey No.2 for the following threatened species which have been previously recorded from within 5km of the location or have some potential to occur based on their known geographical range;

No potential habitat was observed in Survey Area No.2 for the Swift Parrot *Lathamus discolor*.

No native grasslands which is the required habitat of the Tussock Skink *Pseudomoia pagenstecheri* was present in the survey area.

The nearby Tasman River is likely to provide suitable habitat for the Australian Grayling *Prototroctes mareana* and the Azure Kingfisher *Alcedo azurea* subsp *diemensis*. St Dizier Creek is a tributary of the Tasman River so it will be important that all measures are taken to avoid contamination or siltation of St Dizier Creek during the future mine operation.

TASMANIAN DEVIL *Sarcophilus harrisii*:

Tasmanian Devil scats were observed at the following recorded locations:

Site 1. GRID REF: 344843E – 5367907N, 2 scats, not fresh, green in colour and with bone fragments.

Site 2. GRID REF: 344843E – 5367886N, one scat, not fresh.

Site 3. GRID REF: 344842E – 5367917N, 2 scats, not fresh, green in colour with bone fragments.

NON-THREATENED FAUNA OF CONSERVATION SIGNIFICANCE:

- Wombat *Vombatus ursinus*. Scats of Wombats were also observed along this track and are likely to be present at times in both survey areas.
- Ground Parrot *Pezoporus wallicus*. The Wet Heathland vegetation observed in Survey Area No.2 is potential habitat for this bird although no birds were observed during the survey.

ENVIRONMENTAL WEEDS:

No species of environmental weeds were observed in Survey Area No.2.

PHYTOPHTHORA:

There was no symptomatic field evidence observed of the presence of Phytophthora during the field survey of Area No.2.

4.0 Survey Conclusions:

No vegetation community listed as threatened under the *Tasmanian Nature Conservation Act 2002* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* was observed in either survey area.

No species of flora which is listed under the *Tasmanian Threatened Species Protection Act 1995* and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* was observed during the survey of either area.

No species of threatened fauna listed under the above Acts was observed during the survey however evidence was observed (scats) of the presence of Tasmanian Devils in survey area No.2 and it is likely that Devils would roam over both survey areas at times. It is also likely that Spotted-tailed Quolls are present in the area but was not confirmed during the surveys.

No potential denning habitat was observed for either the Devil or the Quoll in either of the two survey areas. Potential habitat for the Azure Kingfisher and the Australian Grayling was present along the nearby Tasman River.

Evidence of the presence of Wombats was observed in Survey Area No.2 and the heathland/buttongrass vegetation was considered to be potential habitat for the Ground Parrot.

No environmental weeds were observed within the two survey areas however Spanish Heath has been recorded from the verge of nearby Heemskirk Road.

No symptomatic evidence of Phytophthora was observed in either area during the surveys.

Survey Area No.2, which is largely outside of the target area, except for the secondary smaller open pit (REF: Map No. 4) had higher conservation values overall than Survey Area No.1 where the main open pit mine is to be sited.

5.0 Recommendations:

VEGETATION COMMUNITIES:

- Clearing for the proposed mine and open pits should not extend further westwards than the secondary open pit as detailed on Map No.4.
- Limit clearing of vegetation to the areas required for the proposed open pit mine, site infrastructure and access roads to the higher slopes and along the existing 4WD tracks between the mine site and the Heemskirk Road
- Ensure the effective containment of all silt, sediment and other contaminants resulting from the proposed mine operation to avoid impacting on adjacent creek-lines which flow into the nearby Tasman River.

THREATENED VEGETATION COMMUNITIES:

- No threatened vegetation community was observed during the field survey and no specific action is required in addition to the recommendations with vegetation communities as detailed above.

THREATENED FLORA:

- No species of threatened flora was observed or recorded during the field survey and none are recorded on the NVA within 5,000 metres of the site. A follow-up survey to target species of orchids during their flowering season may still however be considered necessary.

THREATENED FAUNA:

- No threatened fauna were observed during the survey of Survey Area 1. but evidence of the presence of Tasmanian Devils was observed in Survey Area No.2. No specific action is recommended for Area 1. Survey Area 2 should be treated and managed as a fauna habitat management zone in conjunction with the mine's operation.

THREATENED FAUNA HABITAT:

- The treatment and management of the area covered by Survey Area No.2 as a fauna habitat management zone as detailed under threatened fauna will conserve the most significant areas of potential threatened fauna habitat in the area adjacent to the mine site.
- Adherence to recommendation number three under vegetation communities will ensure that potential threatened fauna habitat along the Tasman River will not be impacted by the mine's operation.

NON-THREATENED FAUNA OF CONSERVATION SIGNIFICANCE:

- The treatment and management of the Survey 2 area as a fauna habitat management zone as detailed above will ensure that the significant area of habitat for the Wombat and Ground Parrot is conserved.

ENVIRONMENTAL WEEDS:

- In order to prevent the introduction of weeds into a weed free area all equipment and machinery should be subject to a wash-down procedure to remove any soil or mud which could contain weed seeds or other progagules before being transported onto the site.
- A weed management/preventative plan should be prepared and implemented as part of the mine's operation.

PHYTOPHTHORA:

- Accepted protocols in regard to hygiene and wash-down procedures for all machinery and equipment should be followed, to ensure that the pathogen is not inadvertently introduced into disease free locations by way of extraneous soil, mud and gravel adhered to tyres, work-boots and equipment during mining activities.

Philip Milner

Vegetation Consultant

**Appendix 1:
Vegetation Communities and Species Recorded**

- 1. Western Buttongrass Moorland (TASVEG Code MBW)**
- 2. Wet Heathland (TASVEG Code SCH)**

Western Buttongrass Moorland was the predominant community in Survey Area No.1. on the undulating slopes and hill tops between the proposed mine site and the Heemskirk Road although patches of low *Leptospermum* Scrub (SLW) occupied the upper reaches of the adjacent creek-lines. Most of the Buttongrass Moorland vegetation was under one metre in height on the higher slopes with just the occasional taller *Leptospermum glaucescens*, *Banksia marginata* and *Hakea epiglottis* up to two metres or so with very occasional *Eucalyptus nitida* of mallee form and of a similar height also present. Buttongrass *Gymnoschoenus sphaerocephalus* made up less than 25% of the species composition in the community which is typical of Western Buttongrass Moorland.

The composition of the vegetation across most of Survey Area No.2 was very similar to Survey Area 1 but with very little Buttongrass observed and generally taller, up to 2 metres in average height. Survey Area 2 was at a lower level across the floor of the valley and species such as *Melaleuca squamea* and *Sprengelia incarnata* were more prevalent, indicating moister soil conditions.

The area would have been subject to relatively frequent fires since the time of white settlement.

Both communities are widespread in the near-coastal areas of western Tasmania.

EMERGENT TREES	COMMON NAME	FREQUENCY
<i>Eucalyptus nitida</i>	Western Peppermint	occasional
MEDIUM SHRUBS		
<i>Acacia melanoxylon</i>	Blackwood	uncommon sapling
<i>Acacia verticillata</i>	Prickly Moses	occasional
<i>Allocasuarina zephraea</i>	Western Sheoak	common
<i>Banksia marginata</i>	Silver Banksia	occasional
<i>Bauera rubioides</i>	Wiry Bauera	occasional
<i>Hakea epiglottis</i>	Beaked Needlebush	occasional
<i>Leptospermum glaucescens</i>	Smokey Teatree	occasional
<i>Leptospermum nitidum</i>	Shiny Teatree	occasional
<i>Leptospermum scoparium</i>	Manuka	common
<i>Melaleuca squarrosa</i>	Scented Paperbark	occasional
<i>Melaleuca squamea</i>	Swamp Honey Myrtle	occasional
<i>Pultenaea daphnoides</i>	Heartleaf Bushpea	occasional
SMALL SHRUBS		
<i>Aotus ericoides</i>	Golden Pea	occasional
<i>Dillwynia glaberimma</i>	Smooth Parrotpea	uncommon
<i>Epacris impressa</i>	Common Heath	localized
<i>Epacris obtusifolia</i>	Bluntleaf Heath	uncommon
<i>Epacris lanuginosa</i>	Swamp Heath	occasional
<i>Leucopogon collinus</i>	White Beardheath	common
<i>Philothea virgata</i>	Twiggy Waxflower	occasional

APPENDIX 1 (cont)

SMALL SHRUBS (cont)

<i>Persoonia juniperina</i>	Prickly Geebung	uncommon
<i>Pimelea linifolia</i>	Slender Riceflower	uncommon
<i>Pultenaea juniperina</i>	Prickly Beauty	uncommon
<i>Sprengelia incarnata</i>	Pink Swamp Heath	occasional
<i>Tetradlea pilosa</i>	Lilac Bells	uncommon

CLIMBERS

<i>Cassytha pubescens</i>	Downy Dodder-laurel	uncommon
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HERBS & HERB-LIKE PLANTS

<i>Mitrasacme pilosa</i>	Hairy Mitrewort	occasional
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GRASSES & GRAMINOIDS

<i>Baloskion tetraphyllum</i>	Tassel Cordrush	localised
<i>Chordiflex monocephalus</i>	Smooth Buttonrush	occasional
<i>Empodisma minus</i>	Spreading Roperush	occasional
<i>Gahnia grandis</i>	Cutting Grass	uncommon
<i>Gymnoschoenus sphaerocephalus</i>	Buttongrass	common
<i>Lepidosperma filiforme</i>	Common Rapiersedge	common to occasional
<i>Leptocarpus tenax</i>	Slender Twinerush	occasional
<i>Patersonia fragilis</i>	Short Purpleflag	occasional
<i>Xyris</i>		

FERNS & ALLIED PLANTS

<i>Gleichenia dicarpa</i>	Pouched Coralfern	occasional
<i>Pteridium esculentum</i>	Bracken	occasional
<i>Selaginella uliginosa</i>	Swamp Spikemoss	occasional

3. *Eucalyptus nitida* Wet Forest over *Leptospermum* (TASVEG Code WNL)

4. *Leptospermum* Scrub (TASVEG Code SLW)

The Eucalypt community was present on the southern facing slopes and along the section of St Dizier Creek located within the proposed site of the open pit. This Eucalypt community also extended along the length of St Dizier Creek as well as forming corridor vegetation along other streams in the locality. The understorey of the Eucalypt community consisted of mainly tall scrubby Teatree *Leptospermum scoparium* and *L. lanigerum* and these two species dominated patches of *Leptospermum* Scrub vegetation which was observed mainly around the periphery of the Eucalypt community.

The Eucalypts were not tall, up to 15 metres or so, with no old-growth trees observed which indicated a relatively high fire frequency in the area.

Both vegetation communities are widespread in western Tasmania.

DOMINANT TREES	COMMON NAME	FREQUENCY
<i>Eucalyptus nitida</i>	Western Peppermint	common
TALL SHRUBS		
<i>Acacia mucronata</i>	Variable Sallow Wattle	occasional
<i>Acacia verticillata</i>	Prickly Moses	occasional
<i>Anopteris glandulosa</i>	Tasmanian Laurel	localised
<i>Banksia marginata</i>	Silver Banksia	occasional
<i>Leptospermum lanigerum</i>	Woolly Teatree	occasional
<i>Melaleuca squarrosa</i>	Scented Paperbark	occasional
<i>Nematolepis squameum</i>	Satinwood	uncommon
<i>Oxylobium arborescens</i>	Shaggy Pea	uncommon
<i>Pittosporum bicolor</i>	Cheesewood	uncommon
<i>Pomaderris apetala</i>	Dogwood	occasional
<i>Ziera arborescens</i>	Stinkwood	occasional
MEDIUM SHRUBS		
<i>Bauera rubioides</i>	Wiry Bauera	occasional
<i>Bossiaea cinerea</i>	Showy Bossia	uncommon
<i>Leptospermum glaucescens</i>	Smoky Teatree	occasional
<i>Leptospermum scoparium</i>	Manuka	common
<i>Monotoca glauca</i>	Goldywood	occasional
SMALL SHRUBS		
<i>Aotus ericoides</i>	Golden Pea	occasional
<i>Epacris impressa</i>	Common Heath	occasional
<i>Leucopogon collinus</i>	White Beardheath	uncommon
<i>Pimelea linifolia</i>	Flax-leafed Riceflower	uncommon
CLIMBING PLANTS		
<i>Billardiera macranth</i>	Climbing Blueberry	localised

APPENDIX 1 (cont)

GRASSES & GRAMINOIDS

<i>Baloskion tetraphyllum</i>	Tassel Cordrush	along creek-line
<i>Calorophus elongatus</i>	Long Roperush	occasional
<i>Dianella tasmanica</i>	Tasman Flaxlily	occasional
<i>Gahnia grandis</i>	Cutting Grass	common
<i>Lepidosperma elatius</i>	Tall Swordsedge	occasional
<i>Patersonia fragilis</i>	Short-stem Purpleflag	occasional

FERNS & ALLIED PLANTS

<i>Blechnum nudum</i>	Fishbone Waterfern	along creek-line
<i>Blechnum watsii</i>	Hard Waterfern	occasional
<i>Dicksonia antarctica</i>	Soft Treefern	along creek-line
<i>Gleichenia microphylla</i>	Scrambling Coralfern	occasional
<i>Histiopteris incisa</i>	Bat's Wing Fern	occasional
<i>Lycopodium deuterodensum</i>	Conifer Clubmoss	occasional
<i>Pteridium esculentum</i>	Bracken	occasional

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2. DPIPWE Website [www.dpipwe.tas.gov.au/threatenedflora/ fauna](http://www.dpipwe.tas.gov.au/threatenedflora/fauna)
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4. Wapstra H, A & M, Gilfedder L. *The Little Book of Common Names for Tasmanian Plants*



PHOTO No. 1: Vegetation typical of the wider location looking southwards, Western Buttongrass Moorland with corridors of *Eucalyptus nitida* with a scrubby understorey along the drainage lines.



**PHOTO No. 2: Target area on ridge and slopes as viewed from the east looking westwards.
Western Buttongrass Moorland on ridge-line *Eucalyptus nitida* Wet Forest on slopes.**



PHOTO No. 3: Proposed open pit area. Western Buttongrass Moorland across the higher slopes.



PHOTO No.4: View to north- west from the proposed open pit site. Heemskirk Road in background. Tasman River extends along the wooded valley in the mid-background.



PHOTO No.5: *Eucalyptus nitida* Wet Forest on the southern facing slopes within the target area.



PHOTO No. 6: *Eucalyptus nitida* Wet Forest with dense scrubby understorey within the proposed open pit area as viewed from the west.



PHOTO No.7 Wet Heathland vegetation in Survey Area 2. Lower slopes to the west of the proposed open pit site.