

**PLAN 2**

**PLANNING APPLICATION P18-047**

**TUNBRIDGE TIER ROAD, TUNBRIDGE**

**ATTACHMENTS**

- A Application & plans, correspondence with applicant
- B Responses from referral agencies



16.4.18

Our ref: P18-047  
Enquiries: Paul Godier

16 April 2018

Hazel Bros Group Pty Ltd  
PO Box 430  
MOONAH 7009

via email: [peter.bennett@hazellbros.com.au](mailto:peter.bennett@hazellbros.com.au)



NORTHERN  
MIDLANDS  
COUNCIL

Dear Mr Bennett

**Additional Information Required for Planning Application P18-047 - Increase production rate at Tunbridge Tier Road, TUNBRIDGE**

I refer to the abovementioned application, which has been reviewed by Council's planners.

The Traffic Impact Assessment is dated 7<sup>th</sup> December 2015. The following information is required to allow consideration of your application under the *Northern Midlands Interim Planning Scheme 2013*:

- A current Traffic Impact Assessment

In accordance with Section 54 of the *Land Use Planning and Approvals Act 1993*, the statutory period for processing the application will not recommence until the requested information has been supplied to the satisfaction of the Planning Authority.

Correspondence, if emailed, must be sent to [Planning@nmc.tas.gov.au](mailto:Planning@nmc.tas.gov.au) and referenced with the planning application number P18-047.

If you have any queries, please contact Council's Planning Section on 6397 7301, or e-mail [Planning@nmc.tas.gov.au](mailto:Planning@nmc.tas.gov.au).

A handwritten signature in blue ink that reads "P. Godier".

Paul Godier  
**Senior Planner**

Copy: Mona Vale Holdings Pty Ltd - [monavaleestate@bigpond.com](mailto:monavaleestate@bigpond.com)

Environment Protection Authority - [epaenquiries@environment.tas.gov.au](mailto:epaenquiries@environment.tas.gov.au)

1-418  
**PLANNING APPLICATION**  
Proposal

**Description of proposal:** The proponent is seeking approval to upgrade Tunbridge Tiers Road Quarry mining license to increase the maximum annual production from its current 70,000m<sup>3</sup> to 140,000m<sup>3</sup>. The quarry recently (2016) had an upgrade approved to the mentioned 70,000m<sup>3</sup>. The requested approval is required in this instance to ensure road pavement materials destined for the Department of State Growth' Midland Highway, York Plains and St Peters Pass road safety upgrade projects, which combined has material requirements exceeding 200,000m<sup>3</sup> to be delivered over a two-year period. The alternative is to provide these materials from quarries located within close proximity to Hobart. This volume of material delivered over a two-year period will generate in excess of 6,000 one-way truck and trailer movements, 12,000 in total. Hazell Bros endeavor is to utilise its Tunbridge Tier Road quarry as the main supply source and by doing so this will provide improved road user conditions for other users hence reducing the risk of potential serious accidents and incidents by not traversing the Midland Highway south of Oatlands, the Cities of Hobart & Glenorchy main road thoroughfares, Municipalities of Brighton and the lower reaches of Southern Midlands thoroughfares with this volume of bulk tip truck movements. Supplying this volume of product from Hazell Bros Tunbridge Tier Road Quarry will also assist with the further development of the quarry in readiness for the Department of State Growth budgeted final four (4) Midland Highway projects, programmed to commence throughout CY 2019 and 2020. All four projects are positioned between Campbelltown and Melton Mowbray, which places Tunbridge Tiers Road quarry within close proximity to all of those noted.

If applying for a subdivision which creates a new road, please supply three proposed names for the road, in order of preference:

1..... 2..... 3.....

**Site address:** .....

NOT APPLICABLE

**CT no:** .....

**Estimated cost of project** \$..... *(include cost of landscaping, car parks etc for commercial/industrial uses)*

**Are there any existing buildings on this property?** Yes / No

If yes – main building is used as .....

If variation to Planning Scheme provisions requested, justification to be provided:

.....NOT APPLICABLE.....

*(attach additional sheets if necessary)*

Is any signage required? NO *(if yes, provide details)*

Date & Time: Thu Feb 1 12:36:15 AEDT 2018  
 Position: 55 S 531913 5336639  
 Altitude: 244m  
 Datum: AUSTRALIAN GEODETIC 1994 (GDA94)  
 Azimuth/Bearing: 354° N06W 6293m.1s (True)  
 Elevation Angle: +02.7°  
 Horizon Angle: +00.8°  
 Zoom: 1X



## Hazell Bros. Group Pty Ltd Tunbridge Tier Quarry – Increase in Production

Prepared By: Barry Williams

Date: 19 April 2018

| Issue      | Date            | Recipient        | Organisation                     |
|------------|-----------------|------------------|----------------------------------|
| Revision 0 | 2 February 2018 | Mr Peter Bennett | Hazell Bros. Group Pty Ltd       |
| Revision 1 | 5 February 2018 | Mr Paul Godier   | Northern Midlands Council        |
| Revision 2 | 22 March 2018   |                  | Environment Protection Authority |
| Revision 3 | 19 April 2018   |                  | Environment Protection Authority |

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## PART A - PROPONENT INFORMATION

TABLE 1: PROPONENT DETAILS

|          |  |
|----------|--|
| Business | Hazell Bros. Group Pty Ltd   |
| ACN      | 088 345 804  |
| Address  | PO Box 430<br>MOONAH Tasmania 7009   |
| Email    | <a href="mailto:peter.bennett@hazellbros.com.au">peter.bennett@hazellbros.com.au</a> |
| Phone    | (03) 6277 7934   |
| Contact  | Mr Peter Bennett   |
| Mobile   | 0488 672 522   |

## 1 PROPONENT BACKGROUND

TABLE 2: PROPONENT DETAILS

|          |                                    |
|----------|------------------------------------|
| Business | Hazell Bros. Group Pty Ltd         |
| ACN      | 088 345 804                        |
| Address  | PO Box 430<br>MOONAH Tasmania 7009 |
| Email    | info@hazellbros.com.au             |
| Phone    | (03) 6278 888                      |

Hazell Bros. Group Pty Ltd heads a diverse group of companies including H.B.M.I. Pty Ltd through which it operates several quarries. Active quarries held and operated by Hazell Bros. Group Pty Ltd or affiliated companies include:

- 6M/2009 – Goanna Road
- 1382P/M – Leslie Vale
- 45M/1982 – Moina
- 50M/1985 – Scottsdale
- 1810P/M – Flowerdale
- 1843P/M – Stutterds Road
- 7M/2009 – Long Hill Quarry



## PART B – PROJECT DESCRIPTION

TABLE 3: PROJECT TITLE

|                      |   |          |
|----------------------|---|----------|
| Name                 | Tunbridge Tier Quarry – production increase |          |
| Address              | Tunbridge Tier Road, Tunbridge              |          |
| Property ID          | 6832983                                     | 3438163  |
| Certificate of Title | 131849/1                                    | 170439/4 |

### 1 DESCRIPTION OF PROJECT

A Mining Lease (1502P/M) was granted in November 1992 to E. A. Cameron for a dolerite quarry producing stone and gravels off Tunbridge Tier Road at Tunbridge. The quarry was operated by H.B.M.I Pty Ltd at a total annual production rate of 20 000 cubic metres (m<sup>3</sup>) per annum. A License to Operate Scheduled Premises (5885) was issued by the Director of Environmental Control.

Due to the lack of State & Federal Government projects programmed for the Midland Highway between 1993 and 2015, the quarry originally approved as a Level 2 activity was deemed not sustainable. The Operator then sought to have the License to Operate Scheduled Premises varied to reduce the maximum level of production to 5 000 m<sup>3</sup> per annum to save costs on annual regulation fees.

In 2015 the Proponent became aware of plans for new government projects in the vicinity of Tunbridge, which made the Tunbridge Tier Quarry a viable operation. On 4 December 2015 approval was sought from the Northern Midlands Council (NMC) to increase the maximum allowable annual production to 70 000 m<sup>3</sup>. The increase in annual production to above 5 000 m<sup>3</sup> triggered the *Environmental Management and Pollution Control Act 1994* (EMPCA) making the quarry once again a Level 2 activity. Assessment of the proposal was required by the Board of the Environment Protection Authority (EPA).

Triggering EMPCA also caused the proposal to follow the Section 57 approval pathway from the *Land Use Planning and Approvals Act 1993* (LUPAA). The proposal was advertised to the public and representations were sought from all interested parties.

On 17 March 2016 the EPA advised it had completed its assessment, taking into account all the information supplied by the Proponent and comments made by government agencies. NMC was advised of a decision to support the issue of a permit with conditions. No representations against the proposal had been received and NMC proceeded to issue a permit to operate the quarry at a rate of 70 000 m<sup>3</sup> per annum.

#### 1.1 PROJECT DETAILS

The Proponent is now seeking approval to upgrade the permit for Tunbridge Tier Quarry to increase the maximum permitted production from 70 000 m<sup>3</sup> to 140 000 m<sup>3</sup> per annum.

Tunbridge Tier Quarry operates on a campaign style basis:

- Machinery and equipment is mobilised to site and a bench for blasting is prepared.
- Drilling equipment is mobilised to site and the pattern of drill holes developed.
- A production blast is initiated, liberating the required volume of source rock.

- Mobile crushers and screens are mobilised to site and the shot rock is processed into various required products and stored in stockpiles.
- The product stockpiles are depleted by carting out to a various project sites.
- Finally, all equipment is demobilised and the site secured until the next campaign.

The proposed increase in production will be achieved by increasing the frequency of the intermittent productive campaigns. The specific aspects of the proposed enhanced operation that will change are:

- The number of productive campaigns will increase from on average three to six per year.
- The number of blasts will increase from seven to a maximum of ten per year.
- The number days on which cartage trucks will be utilising Tunbridge Tier Road will increase from around 100 to around 200.

All other aspects of the existing permitted operation will remain unchanged.

**TABLE 4: EXISTING OPERATION - PERMIT CONDITIONS**

|   |   |
|---|---|
| Permitted use:                                      | Development Approval – (P15-358)  |
| Permit Part B Permit Conditions – Environmental No. | 9294  |
| Regulatory Limits:                                  | 70 000 cubic metres rocks, ores minerals processed<br>112 000 tonnes rocks, ores minerals processed |
| Hours of Operation                                  |   |
| Weekdays:   | 7.00 am to 7.00 pm  |
| Saturdays:  | 8.00 am to 4.00 pm  |
| Sundays, public holidays:                           | No work   |

## 1.2 EXISTING PERMIT CONDITIONS

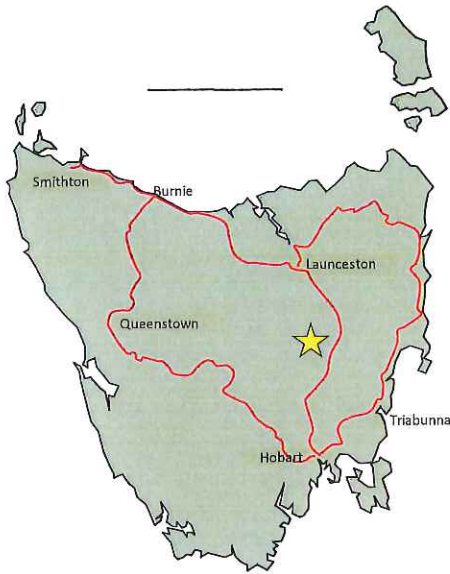
Tunbridge Tier Quarry was recently issued with a permit to operate up to and maximum annual production of 70 000 cubic metres. This permit was issued with Permit Part B, Permit Conditions – Environmental No. 9294, dated 17 March 2016. The permit conditions imposed for the previous proposal are reproduced here as Appendix 1.

**TABLE 5: PROJECT DETAILS**

|  |   |
|--|---|
| Project Name                             | Tunbridge Tier Quarry – increase production |
| Increase in Production (m <sup>3</sup> ) | 70 000 to 140 000 per annum                 |
| Increase in production (t)               | 112 000 to 224 000 per annum                |
| Increase in campaigns                    | Averaging 3 to 6 campaigns                  |
| Increase in blasts                       | Maximum of 7 to 10 per year                 |
| Increase in cartage task                 | 100 days carting to 200 days carting        |

The increase in production will be achieved by an increase in the number and duration of productive campaigns. All other aspects of the operation will remain unchanged.

2 PROJECT AREA



The Tunbridge Tier Quarry is located approximately 4 kilometres northwest of the township of Tunbridge. The site is situated on a low hillock in a landscape with generally low relief.

The quarry is situated close to the crest of the hillock as it rises to an elevation of 240 m AHD<sup>1</sup>. The quarry floor is currently at an elevation of around 230 m with scope to lower to 220 m while maintaining the capability to drain naturally.

The access track to the quarry intersects with Tunbridge Tier Road approximately 3.8 kilometres west of the junction with the Midland Highway.

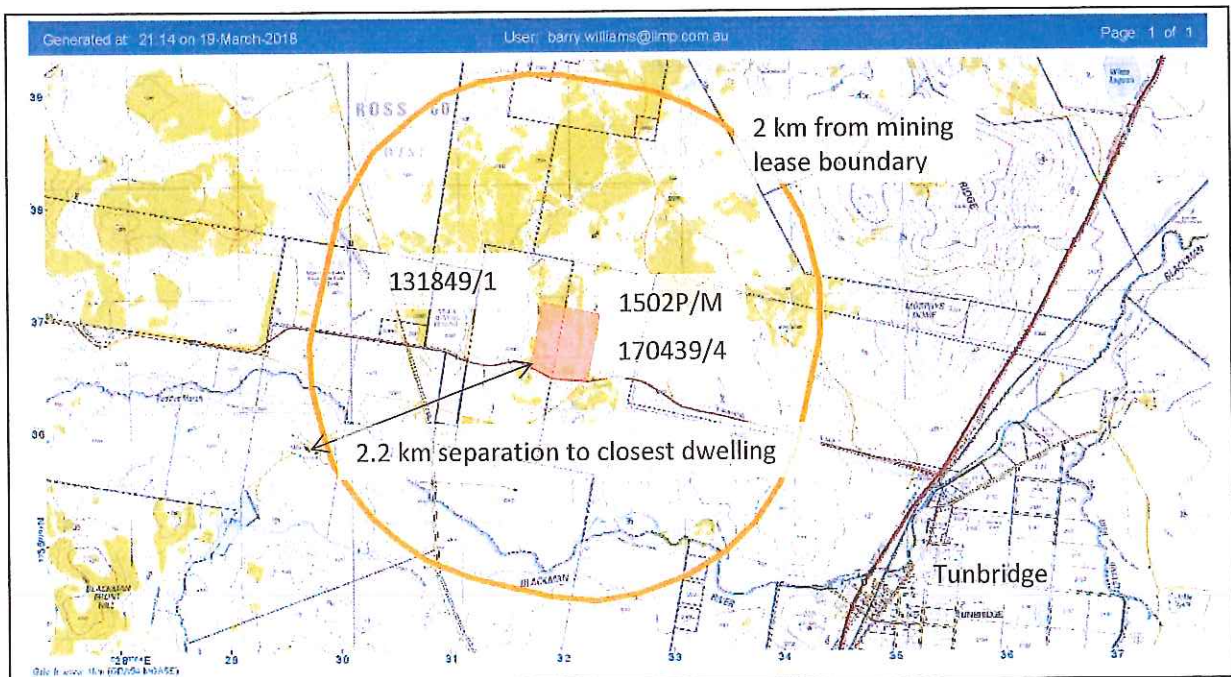


FIGURE 1: LOCALITY PLAN (EXTRACT FROM TASMAT TOPOGRAPHIC TUNBRIDGE)

<sup>1</sup> AHD – Australian Height Datum

TABLE 6: PROPERTY DETAILS

|                             |  |          |
|-----------------------------|--|----------|
| <b>Address</b>              | Tunbridge Tier Road, Tunbridge   |          |
| <b>Property ID</b>          | 6832983  | 3438163  |
| <b>Certificate of Title</b> | 131849/1   | 170439/4 |
| <b>Tenure</b>               | Private Land   |          |
| <b>Land Owner</b>           | E. A. Cameron  |          |
| <b>Land Capability</b>      | 5 and 6  |          |
| <b>Mining Lease</b>         | 1502P/M  |          |
| <b>Mining Lease Area</b>    | 32 hectares  |          |
| <b>Mining Lease Status</b>  | Granted  |          |
| <b>Municipality</b>         | Northern Midlands Council  |          |
| <b>Planning Scheme</b>      | Northern Midlands Interim Planning Scheme 2013   |          |
| <b>Land Use Zone</b>        | 26.0 Rural Resource  |          |
|                             | 26.1.1 Zone Purpose Statement.   |          |
|                             | 26.1.1.1 To provide for the sustainable use or development of resources for agriculture, aquaculture, forestry, mining and other primary industries, including opportunities for resource processing.                |          |
| <b>Use classes</b>          | Level 2 Activity Extractive Industries are 'Discretionary' in the Rural Resource Zone.   |          |
| <b>Overlays</b>             | The mining lease boundary captures a corner of the Priority Habitat Overlay on the eastern and western side.<br><br>An area mapped as flood prone is located approximately 50 metres away from the western boundary. |          |

Copies of Folio Plans and Text included as Appendix 2.

## 2.1 VEGETATION

The Tunbridge Tier Quarry is located on an exposed ridgeline, which is sparsely covered with both exotic and native grassland pasture. Copses of *Acacia-Bursaria* woodland and scrub are sparsely spaced over the top of the ridge, some of these will be disturbed by the ultimate quarry footprint. Open woodlands dominated by *Eucalyptus pauciflora* are found around the slopes of the ridge and these will not be disturbed by the quarry activities. A small area of native grassland mapped as GTL - Lowland *Themeda triandra* grassland cuts across the eastern boundary as does a small area mapped as AHS - Saline aquatic herbland on the west boundary. The proposed quarry operation will not disturb either of these communities as currently mapped.

A series of botanical surveys conducted in 2015 found that the future quarry development area is predominantly agricultural land (FAG) and rock-plate grassland (GRP). Both communities are not listed as threatened under the Nature Conservation Act 2002. The proposed quarry development area mainly avoids any other vegetation communities. The boundaries of the various communities have been considered in establishing the extent of future quarry development.

## 2.2 SOILS

The soils over the ridgeline where future extraction activities will take place are skeletal residual dolerite derived soils. There are numerous rock-plate outcrops over the prospective area. Where soil has been retained it is thin, 100 to 200 mm and of a typical dolerite derived red-brown medium clay

## 2.3 WATERCOURSES

A water course number 258149 runs approximately 50 metres to the west of the western mining lease boundary and is a tributary to the Blackman River. This watercourse is given an integrated conservation value (ICV) of High by the Conservation of Freshwater Ecosystem Values (CFEV)<sup>2</sup> program. The watercourse is connected to a wetland with an ICV of High.

## 2.4 SURROUNDING LAND USE

The Tunbridge Tier Quarry is set in a pastoral landscape. The land immediately surrounding the quarry disturbance is privately owned and used for grazing sheep. Further west on Tunbridge Tier Road a parcel of Crown Land is identified as a stock resting reserve and alongside but further west is an informal air field. Recent irrigation developments have facilitated more intensive farming practices with irrigated agriculture becoming prevalent on many properties in the vicinity.

The closest building is situated 1.2 kilometres south of the quarry. The closest inhabited dwelling is on the 'Cheam' property, which is situated 2.2 kilometres southwest of the quarry.

## 3 MAP AND SITE PLAN

The Tunbridge Tier Quarry site is situated on a prominent hillock within the Northern Midlands Bioregion. The setting is remnant native grassland and low scrub with significant natural flora values in places. The detailed ecological assessment undertaken for the most recent application assessment process found areas of grassland with a high probability of supporting listed native orchid species and other threatened flora. The mining plan for the Tunbridge Tier Quarry took this information into account and the Proponent established preservation areas with the assistance of the ecologist to facilitate future monitoring and research.

The mining plan area will not change for this proposal. The extractive program will accelerate to provide access to more source rock and ultimately the excavation may proceed to a lower level within the boundaries of the existing mining plan footprint. No additional clearing over and above that defined for the previous proposal will be required.

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<sup>2</sup> The Conservation of Freshwater Ecosystem Values (CFEV) program is a comprehensive assessment of the ecosystem values of the watercourses in Australia. Each watercourse is evaluated for its natural and ecosystem values and then checked for its vulnerability and an Integrated Conservation Value (ICV) established for that reach of the watercourse

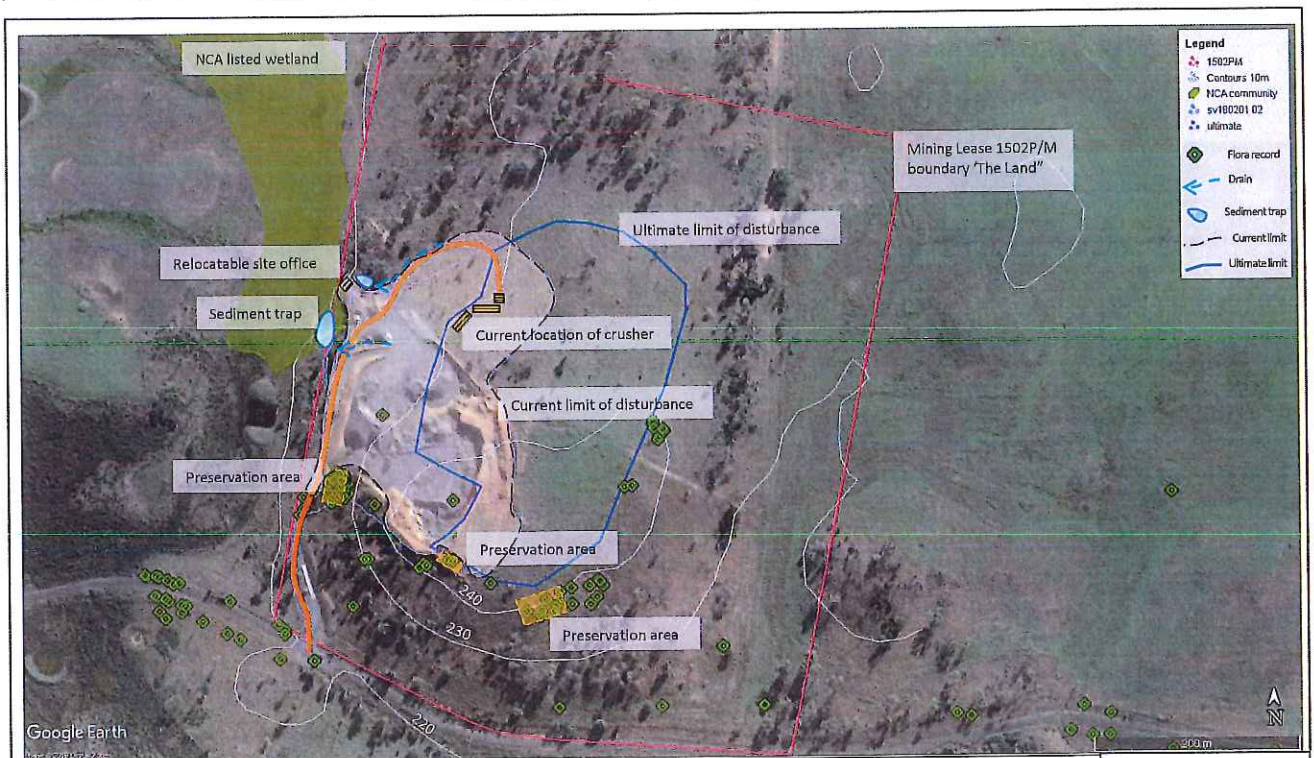


Figure 2: GE image with mining lease, existing and ultimate limits of disturbance

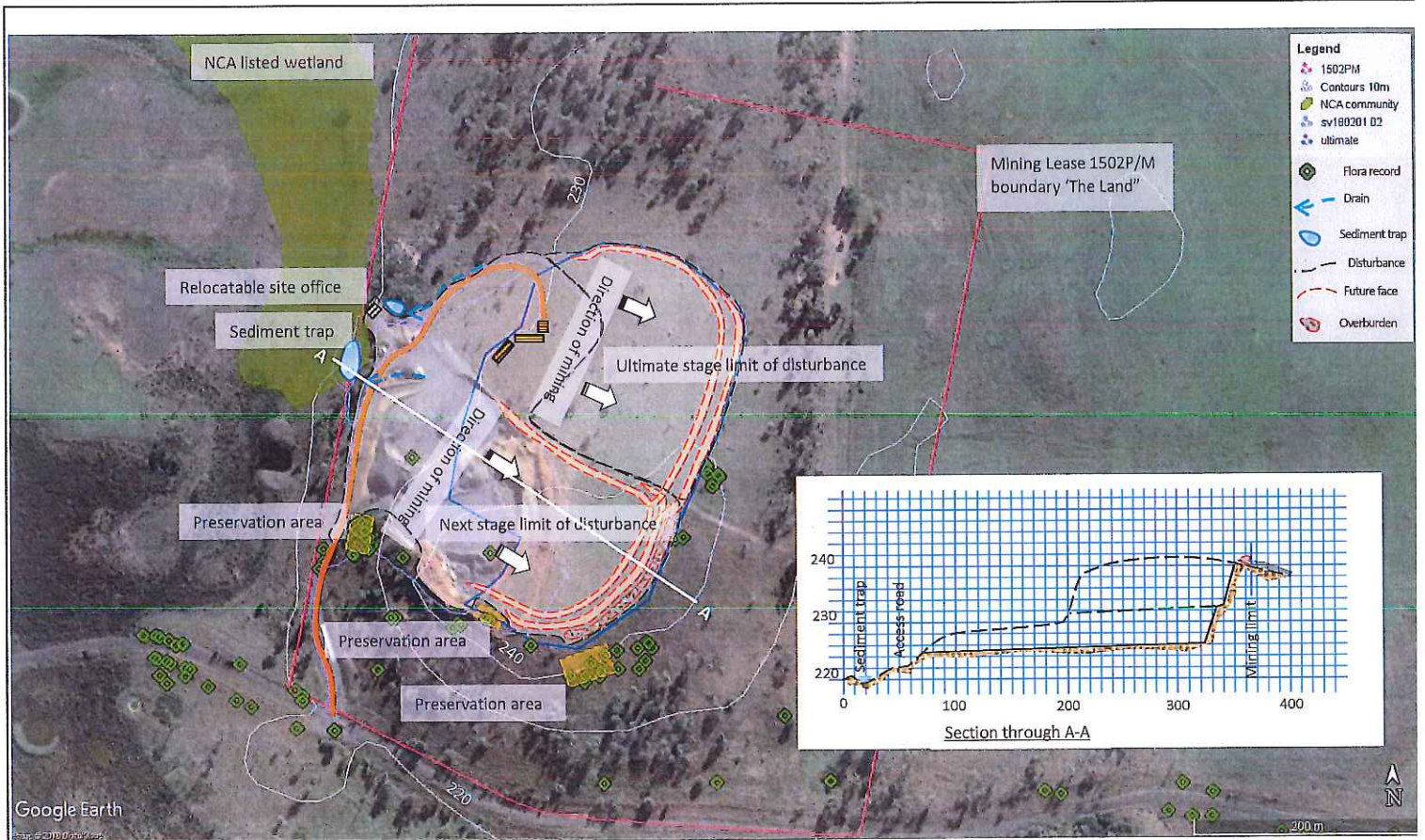


Figure 3: GE image with future stages of extraction and limits of disturbance

## 4 RATIONALE AND ALTERNATIVES

The Tunbridge Tier Quarry was originally established to supply aggregates and gravels for road construction projects in the Tunbridge region. The State Government has recently announced that an extensive program of Midland Highway Upgrade works will be delivered over the next 10 years. There are few quality dolerite quarries located in the central portion of the Midland Highway. An upgraded Tunbridge Tier Quarry will be ideally located to service road construction projects on the Midland Highway without extensive cartage distances and costs.

The alternative would be to supply the road construction projects on the Midland Highway by carting product from major quarries in the south or north. The extra cartage would add to the cost of the materials which would be reflected in the contract prices paid by the government and hence taxpayers. Furthermore, this alternative would add more heavy vehicles to the already significant freight load carried by the Midland Highway which would add to the maintenance, congestion and frustration experienced by other road users.

## PART C POTENTIAL ENVIRONMENTAL EFFECTS

### 1 FLORA AND FAUNA

The ultimate development of the Tunbridge Tier Quarry will disturb an area that is mapped within the TasVeg Database 3.0 predominantly as FAG – agricultural land with a small copse of DRO – *Eucalyptus rodwayi* woodland. Well outside the area of disturbance an area mapped as GTL – lowland *Themeda triandra* grassland only slightly intrudes into the mining lease boundary.

Work done in November 2015 by Mark Wapstra produced a more complex picture of the vegetation communities within the mining lease area, see Appendix 3 Figure 6, page 20 (ECOtas, Nov 2015). The combination of various studies for the Tunbridge Tier Quarry produced numerous records of observations of threatened flora species in the area, represented in this document in Figure 2. The records from within the quarry footprint represent spear grass which has since been destroyed under a 'Permit to Take' issued for the previous proposal.

Clusters of records in close proximity to the quarry extractive areas have been cordoned off with preservation fences, represented also in Figure 2. The ultimate area of disturbance for the quarry was adjusted to recognise local populations of significant flora species. Current works are within this ultimate perimeter in the vicinity of the threatened species.

Current progress with the commitments made for the previous proposal are tabulated below:

TABLE 7: PROGRESS WITH COMMITMENTS (FLORA)

| Commitment | Description   | Responsibility | Timing                                     |
|------------|---|----------------|--|
| 1.         | Future stripping will be undertaken with consideration to the boundaries of the various vegetation communities on the fringe of the development area. | Operator       | As required to facilitate the mining plan. |
| 2.         | All existing preservation fencing will be retained for the life of the quarry.  | Operator       | At all times                               |



|    |  |          |                             |
|----|--|----------|-----------------------------|
| 3. | Future clearing will be contained within approved future development area. No future permits are anticipated | Operator | For the life of the quarry. |
| 4. | The existing Weed Management Plan will remain current.   | Operator | For the life of the quarry  |

*Permit Condition - G8 Weed Management Plan –*

The Proponent was required to have submitted a weed management plan to the Director of the Environment Protection Authority within 3 months of the issue of the notice. A copy of the Weed Management Plan is included as Appendix 4.

*Permit Condition - FF1 Protection of threatened flora species –*

The Ecologist undertaking the flora and fauna assessment identified habitat potentially containing threatened species communities and recommended these were preserved. The Proponent erected fences around these areas to ensure no damage occurred with development or ongoing operations, see Figure 2.

*Permit Condition - FF2 Protection of threatened vegetation communities –*

Quarry development extractive activities undertaken so far has progressed into the area agreed as the ultimate development footprint, see Figure 2.

Preservation area retained to guide site development and operations activities.

Two other preservation areas are retained above the main quarry top face.

The Ecologist periodically visited these sites to study any changes to the communities. This work is for the ecologists own research, no reports are requested.

The Proponent has complied with the current permit conditions relating to threatened flora on the site. The new proposal will not cause any change to the area of disturbance approved for quarry development. No additional clearing outside the future development area or permits are required.

## 2 RIVERS CREEKS WETLANDS AND ESTUARIES

Tunbridge Tier Quarry is situated on the western side of, and close to the crest of a ridgeline. The landform is a gradual slope towards a flat and water-logged area comprising a natural watercourse and swampy wetlands. There is a native vegetation community represented within the swampy area mapped by TasVeg 3.0 database as AHS – Saline aquatic herbland. This community is listed as threatened under the *Nature Conservation Act 2002*.

The watercourses downstream from the Tunbridge Tier Quarry are classified as having a ICV of High (DPIPWE (A), 2015). At its closest approach the access road to the Tunbridge Tier Quarry is only 50 metres away from the watercourse and the vegetation community is mapped as being closer.

There will be no works in the watercourse or impoundment of a watercourse related to this proposal. There will be works including clearing within 200 metres of a wetland. The stormwater management infrastructure detailed below will control the flows and mitigate any potential effects.

As part of the previous proposal, infrastructure has been installed to ensure that runoff from all future activities on the site is collected in a sediment retention basin that will provide sufficient detention time to allow sediment to settle out. The sediment retention infrastructure has capacity to retain sediment in flows of up to a 1 in 20 year reoccurrence interval storm.

Since the previous proposal was approved, the Proponent identified a need for a secondary sediment retention trap, which will be installed to capture runoff from the haul road and current processing site.

### 2.1 STORMWATER RUNOFF CALCULATIONS

The catchment for the Tunbridge Tier Quarry sediment retention basin is an unpaved gravel surface including the faces, benches and floor of the ultimate quarry footprint. It is unlikely that the entire area will be exposed at one time as early progressive rehabilitation and revegetation works will reduce the area running off. However, the total ultimate footprint will have a maximum area of 6.0 hectares.

Calculations used to determine the dimensions of a sediment retention basin required to manage the runoff from a 1 in 20 year reoccurrence event are as follows:

$$T_c = 91L / (A^{0.1} * S_e^{0.2})$$

TABLE 8: TIME OF CONCENTRATION CALCULATIONS

| Flow line L (km) | Area A (ha) | Equal area Slope Se (m/km) | Tc | Time of concentration (min) |
|------------------|-------------|----------------------------|----|-----------------------------|
| 0.380            | 6.0         | 52                         |    | 13 min                      |

$$Q = C . i . A$$

360

TABLE 9: FLOW RATE CALCULATION

| Coefficient of runoff C<br>(no units) | Intensity of rain event I<br>(mm/hr) | Catchment Area A (ha) | Flow rate Q (m <sup>3</sup> /s) |
|---------------------------------------|--------------------------------------|-----------------------|---------------------------------|
| 0.35                                  | 65                                   | 6.0                   | 0.38                            |

Assume sediment basin 20.0m x 8.0m x 1.0 m deep

TABLE 10: REQUIRED SURFACE AREA COMPARED TO ACTUAL SURFACE AREA

| Flow rate Q (m <sup>3</sup> /s) | Retention basin area from WSUD<br>Figure 3.2 (m <sup>2</sup> ) for 90% capture | Actual basin surface area (m <sup>2</sup> ) |
|---------------------------------|--|---|
| 0.38                            | 150  | 160   |

(Derwent Estuary Program, 2012)

Total storage capacity  $(160 + 108)/2 = 134 \text{ m}^3$

Assume storage 50% of total capacity =  $67 \text{ m}^3$

Adapted from (Derwent Estuary Program, 2012)

$$F_r = S_t / (A \times R \times L_o)$$

TABLE 11: DESIRED CLEAN OUT FREQUENCY

| Capture efficiency<br>(R) | Contributing<br>catchment A (ha) | Storage Volume S <sub>t</sub><br>(m <sup>3</sup> ) | Sediment loading<br>rate L <sub>o</sub> (m <sup>3</sup> /ha/yr) | Desired clean out<br>frequency F <sub>r</sub> (yrs) |
|---------------------------|----------------------------------|--|---|---|
| 0.90                      | 6.0                              | 67   | 10  | 1.2   |

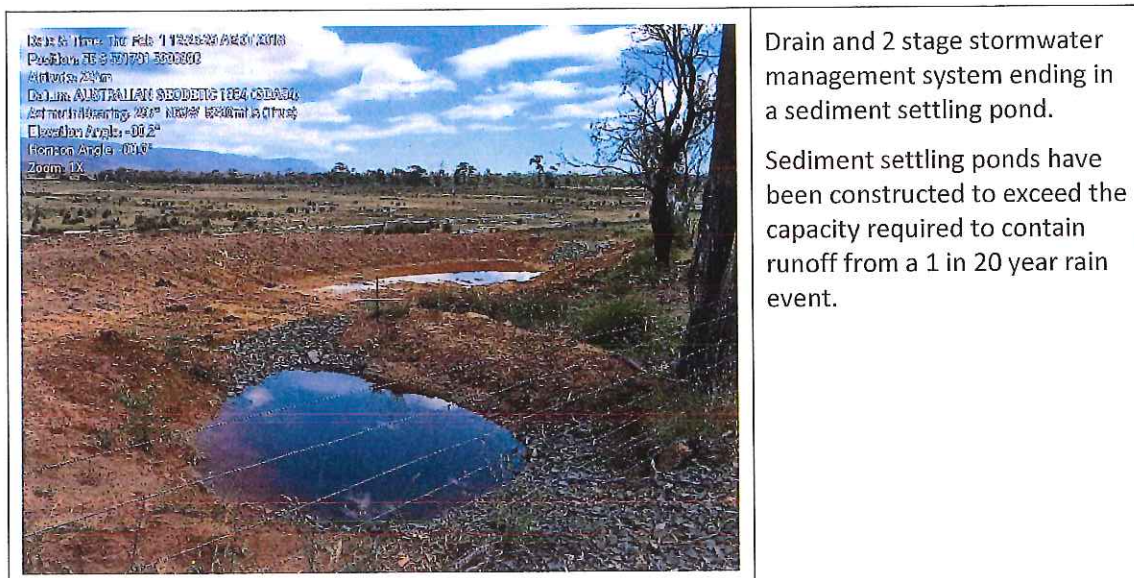
The clean out frequency is 1.2 years which gives an adequate factor of safety for an annual clear out. The sediment from the sediment retention basin should be lost within production materials.

TABLE 12: PROGRESS WITH COMMITMENT (RUN-OFF)

| Commitment | Description   | Responsibility | Timing                      |
|------------|---|----------------|-----------------------------|
| 5.         | All existing stormwater and sediment control infrastructure will be maintained. | Operator       | For the life of the quarry. |

*Permit Condition E1 Perimeter drains, E2 Stormwater, E3 Design and maintenance of settling ponds.*

The Proponent was required to install perimeter drain and sediment settling ponds appropriately sized to contain runoff from a 1 in 20 year storm event.



Drain and 2 stage stormwater management system ending in a sediment settling pond.

Sediment settling ponds have been constructed to exceed the capacity required to contain runoff from a 1 in 20 year rain event.

The drainage and sediment retention facilities are effective in controlling sediment transport from the site. The Proponent has complied with current permit conditions relating to stormwater and sediment transport.

### 3 SIGNIFICANT AREAS

Tunbridge Tier Road is one route taken to travel to Interlaken and on to the Central Highlands from the Midland Highway. The Central Highlands is a destination for tourists, anglers, bushwalkers and others seeking the recreational opportunities Tasmania's high country offers. There are few other areas in close proximity that would be considered significant. Careful placement of the quarry operation has ensured that the disturbed areas and infrastructure will remain largely out of sight.

In spring and summer the native grasslands that comprise portions of the grazing land can be expected provide opportunities for botanists and ecologists to observe and record rare herbs and orchids. The studies commissioned by the Proponent have already added to the understanding of the botanical values of the land surrounding the quarry.

### 4 COASTAL ZONE

The catchment in which the Tunbridge Tier Quarry is located drains to the coast through the Macquarie and Tamar rivers. The site is separated from the coast by approximately 130 kilometres in this direction. It is highly unlikely that the activity can affect anything at the coast.

### 5 MARINE AREAS

The catchment in which the Tunbridge Tier Quarry is located drains to the coast through the Macquarie and Tamar rivers. The site is separated from the coast by approximately 130 kilometres in this direction. It is highly unlikely that the activity can affect any marine areas.

### 6 AIR EMISSIONS

Tunbridge Tier Quarry will operate on a campaign style basis with periods of activity interspersed with periods of dormancy. It is not proposed to construct permanent infrastructure on the site.

When the quarry is operating there will be various activities that can, under certain conditions produce dust emissions. These activities, and the techniques to mitigate the risk are as follows:

- Drilling and blasting: The dust from drilling will be picked up by the drilling machine. This means the immediate risk of dust surrounding the holes being picked up by the wind will be mitigated and also excessive dust will not be ejected into the air on firing.
- Pushing and loading: Pushing will occur at low speeds and loading drop distances to hoppers and stockpiles will be kept small.
- Overburden stockpiles and windrows will be kept low (maximum 2 metres) and vegetation will be encouraged to protect the surfaces from wind erosion.
- Screening and crushing: The screener / crusher will be brought to site specifically for the campaign. If dust from the screener / crusher becomes a nuisance temporary water jets will be used to wet down the product on the conveyors.
- Loading and carting: Again, the drop distances for loading trucks will be kept small and if the loads protrude above the sides of the tray, covers or wetting will be deployed to contain the risk of dust emissions from the trucks.
- A speed limit of 25 kilometres per hour will be applied to all vehicles within the quarry site and access road.

In addition, Tunbridge Tier Quarry is situated remotely from receptors that may be susceptible to excessive dust emissions. The nearest residence is around 2.2 kilometres away.

**TABLE 13: PROGRESS WITH COMMITMENT (DUST)**

| Commitment | Description   | Responsibility | Timing                                   |
|------------|---|----------------|--|
| 6.         | Strategies will be employed to minimise the impact of dust emissions. | Operator       | During all future operational campaigns. |

## 7 LIQUID EFFLUENT

It will not be practical to set up staff amenities at the Tunbridge Tier Quarry for the short time that activities will occur on site each year. Relocatable toilets will be established onsite for each operational campaign. These toilets will retain the effluent and periodically be taken to a disposal site to have the holding tanks emptied.

## 8 SOLID WASTES

The site will be cleared of all surplus equipment and infrastructure at the end of each campaign. Any wastes that have accumulated as a result of machine repairs will be removed at the end of the campaign. Litter arising from lunches and routine servicing of equipment will be removed at the end of each working day.

## 9 NOISE EMISSIONS

### 9.1 EQUIPMENT NOISE

The Tunbridge Tier Quarry will be operated on a campaign style basis. Through the course of a campaign various items of mobile equipment will be mobilised on site and utilised for various operations. Once the machines have completed the task and if they are not required for subsequent operations the machines will be demobilised.

#### 9.1.1 CLEARING AND STRIPPING

Periodically a new area of the quarry will be opened up to facilitate extraction. Clearing will take place progressively to limit the area of disturbed ground to the minimum necessary to accommodate extraction, processing, manoeuvring and stockpiles. The following equipment will be used for clearing stripping.

**TABLE 14: EQUIPMENT USED IN CLEARING / STRIPPING**

| Operation            | Machine 1                | Power output | Machine 2             | Power output |
|----------------------|--------------------------|--------------|-----------------------|--------------|
| Clearing / stripping | Excavator: Komatsu PC300 | 280 kW       | Wheel Loader: Cat 966 | 200 kW       |

#### 9.1.2 DRILLING AND BLASTING

The benches prepared in the previous operation will be drilled ready to accept the explosives load.

**TABLE 15: EQUIPMENT USED FOR DRILLING / BLASTING**

| Operation           | Machine 1               | Power output |
|---------------------|-------------------------|--------------|
| Drilling / blasting | Drill Rig: Sandvick 900 | 300 kW       |

#### 9.1.3 CRUSHING / SCREENING

Following a blast, the shot rock will be run through a crusher / screener plant to produce various products with the desired properties. A wheel loader will load the crusher hoppers and tend the product stockpiles. The actual configuration of the crusher screener will vary according to the desired product properties. The configuration will be made up of the machines listed below:

**TABLE 16: EQUIPMENT USED FOR CRUSHING / SCREENING**

| Operation            | Machine 1             | Power output | Machine 2                   | Power output |
|----------------------|-----------------------|--------------|-----------------------------|--------------|
| Crushing / screening | Wheel Loader: Cat 966 | 200 kW       | Jaw Crusher Sandvick UJ 440 | 300 kW       |

| Operation            | Machine 3                 | Power output | Machine 4          | Power output | Machine 5        | Power output |
|----------------------|---------------------------|--------------|--------------------|--------------|------------------|--------------|
| Crushing / screening | Cone Crusher<br>45" Eljay | 250 kW       | Extec E7<br>screen | 300 kW       | Auspactor<br>VSI | 300 kW       |

#### 9.1.4 LOADING / TRANSPORT

The products will be loaded out to the project site using light combination trucks with a conservative pay load of 32 tonnes. The actual trucks used will vary for each campaign but will be loaded using the wheel loader.

The Tunbridge Tier Quarry has been set out with the faces orientated to the west and with the southern portion of the ridgeline retained. The southern ridge along with the low overburden windrows placed above, provide a substantial permanent topographical barrier attenuating noise for receptors in the south and east direction. As the proposed quarry development proceeds first east and later north from the existing pit, extractive operations will continue to avoid and hence retain this ridgeline landform.

TABLE 17: PROGRESS WITH COMMITMENT (NOISE)

| Commitment | Description   | Responsibility | Timing                             |
|------------|---|----------------|------------------------------------|
| 7.         | The quarry development plan will retain the existing ridgeline on the south side to attenuate noise for receptors to the south. | Operator       | For all future quarry development. |

## 9.2 BLASTING NOISE

The increase in production at the Tunbridge Tier Quarry will be achieved with larger and more frequent extractive campaigns. It will be necessary to increase the frequency of blasting to facilitate each extractive campaign. It is likely that each blast will liberate around 10 000 bank cubic metres (BCM) of dolerite rock with an average density of 2.8 t/m<sup>3</sup>. The bulk density of the final product is assumed to be approximately 1.6 t/m<sup>3</sup>, hence at full production 8 blasts per year is anticipated. Occasionally quarry development blasts may be required, hence a maximum number of blasts per year will be 10.

Blasting will be conducted by a fully qualified and experienced blasting contractor that will employ techniques to minimise air blast overpressure and ground vibration impacts. The techniques employed to control blasting impacts are detailed in Section 5 of the Blast Management Plan included in this document as Appendix 5 and summarised below:

- Air Overpressure: stemming height and software generated blast design.
- Vibration: minimising instantaneous charge (MIC) and software generated blast design.
- Fly Rock: Stemming height, blast design and exclusion zones.
- Traffic Management: Fully trained and qualified Blast Guards to control traffic on Tunbridge Tier Road.

- Machinery and Equipment: Fully qualified shot firer will advise on safe placement of equipment and machinery.

The orientation of the faces described above and sympathetic blast design will ensure that blasting impacts are minimised in the south and east direction.

TABLE 18: PROGRESS WITH COMMITMENT (BLASTING)

| Commitment | Description   | Responsibility      | Timing                    |
|------------|---|---------------------|---------------------------|
| 8.         | Blasting will be conducted in accordance with a documented Blast Management Plan. | Blasting Contractor | For each successive blast |

## 10 TRANSPORT IMPACTS

The Tunbridge Tier Quarry is located on Tunbridge Tier Road approximately 3.8 kilometres from the junction with the Midland Highway. This section of Tunbridge Tier Road is sealed with a reasonably straight alignment. Shallow crests along the route can conceal oncoming cars although trucks, being higher, will have better visibility and are more visible.

At maximum production the quarry will produce 140 000 cubic metres or 224 000 tonnes at an average bulk density of 1.6 t/m<sup>3</sup>. The quarry will mainly service only major road contracts, it is likely therefore that the material will be carted using light combination trucks with a conservative payload of 32 tonnes. During an operational campaign it is likely 3 employees will run the site. Assuming employees travel alone, on average 6 extra light vehicle movements per day will be added to the total.

The cartage task for the annual production will be 7 000 loads or 14 000 truck movements per year. The Tunbridge Tier Quarry will operate to service major projects. It is expected that the cartage task will occur over short but intensive periods.

Terry Eaton (Traffic Engineer) prepared a Traffic Impact Assessment for the recent Level 2 Activity application. This document is included as Appendix 6 and is referenced here.

(Eaton T, Dec 2015) found that a fleet of 6 light combination trucks with a 1.5 hour turn around will achieve 40 loads per day and cart 1 200 tonnes. This figure is extremely conservative as it assumes on average the trucks will carry only 30 tonnes each load. However, using this figure the entire years production will be carted in 187 days.

TABLE 19: TRAFFIC MOVEMENTS

|                   | Annual production (m <sup>3</sup> ) | Annual production (tonnes) | Heavy vehicle movements (annual) | Heavy vehicle movements (day) | Light vehicle movements (day) | Total movements (day) |
|-------------------|-------------------------------------|----------------------------|----------------------------------|-------------------------------|-------------------------------|-----------------------|
| Current operation | 70 000                              | 112 000                    | 3 500                            | 12                            | 6                             | 18                    |



|                    |         |         |       |    |   |    |
|--------------------|---------|---------|-------|----|---|----|
| Proposed operation | 140 000 | 224 000 | 7 000 | 24 | 6 | 30 |
| Peak operation     |         |         |       | 40 | 6 | 46 |

The TIA (Eaton T, Dec 2015) recommended the following improvements were implemented to improve truck manoeuvring radiuses and in consideration to other road users:

- Upgrade quarry entrance for outward movement to conform with Figure 6.61 of Austroads.
- Install truck advisory signs W5-22 ‘truck’ with attachment ‘Turning’ plate on both approaches at 140 metres distant from the entrance.

TABLE 20: PROGRESS WITH COMMITMENT (TRAFFIC)

| Commitment | Description   | Responsibility | Timing                                     |
|------------|---|----------------|--|
| 9.         | The recommendations of the TIA (Eaton T, Dec 2015) are fully implemented. | Proponent      | Existing installations will be maintained. |

The Traffic Impact Assessment recommended that trucks entering signs be installed on the approach to the quarry entrance and that the eastbound turning radius out of the quarry entrance is improved.



The quarry operation and development comply with the permit conditions issued by the Board of the Environment Protection Authority, Northern Midlands Council and the Proponent’s own commitments presented in support of the case to upgrade the quarry.

## 11 OTHER OFF-SITE IMPACTS

Section 9 Noise Impacts; describes the likely noise sources and the factors that attenuate the noise levels to ensure that any neighbouring properties are not adversely affected by noise.

Another off-site impact relates to traffic impact on Tunbridge Tier Road as a result of the additional truck movements generated by the quarry operation. Section 10 and Appendix 6 deal with this impact and makes recommendations to resolve traffic issues.

## 12 DANGEROUS SUBSTANCES AND CHEMICALS

The Proponent engages professional blasting contractors fully licenced to handle, store and transport explosives. Blasting equipment and materials will be brought onto the site on the day of a blast and removed from the site at the end of the day. Explosives and blasting equipment is not stored onsite.


Mobile equipment requires small quantities of lubricating fluids and refuelling on a daily basis while production campaign is underway. These materials will be transported and stored in utilities. While a production campaign in underway a hydrocarbon spill kit will be located on the site ready for immediate deployment, in the event of a spill incident. Spills are most likely to occur when machinery is being refuelled, usually from overfilling. In these situations, the volume of the spill is small, usually less than 10 litres.

TABLE 21: PROGRESS WITH COMMITMENT (CHEMICALS)

| Commitment | Description  | Responsibility | Timing   |
|------------|--|----------------|--|
| 10.        | A hydrocarbon spill kit will be made available on site for immediate deployment during each extractive campaign. | Operator       | A hydrocarbon spill kit will continue to be available. |

### Permit Condition - H1 Spill kits

The permit condition required the Proponent to keep a spill kits appropriate for the types and volumes of potential spills available for immediate deployment.

|   |  |
|---|--|
|  | <p>Self bunded 'Trans Tank' refuelling facility with a spill kit at the ready.</p> |
|---|--|

### 13 SITE CONTAMINATION

The Proponent has been the operator of the quarry since establishment in 1992. The Operator and the Landowner has not stored contaminated materials on this site.

### 14 SUSTAINABILITY AND CLIMATE CHANGE

The motivation behind this proposal to upgrade the Tunbridge Tier Quarry and increase the maximum annual production rate is to eliminate the need to cart large volumes of aggregates and gravels from major quarries in the north or south of Tasmania. By not carting heavy construction materials over large distances but rather supplying from quarries close at hand there will be a net reduction in diesel fuel consumption and hence greenhouse gas emissions.

### 15 CULTURAL HERITAGE

Aboriginal Heritage Tasmania (AHT) has searched the Aboriginal Heritage Register for records of sites or finds in close proximity to the Tunbridge Tier Quarry and found that none exist. AHT believe there is a low probability that the proposed upgraded operation will disturb Aboriginal heritage and has not requested a site-specific study.

If during the course of the works an item or site that is suspected to have Aboriginal heritage significance is observed the provisions of an Unanticipated Discovery Plan will be invoked.

The Western Tiers Convict Road Party Site is registered on the Tasmanian Heritage Register as being located on Tunbridge Tier Road some 2 kilometres west of the quarry site. There is scant information available about this site. The overwhelming majority of traffic movements will be east from the quarry hence it is highly unlikely that this proposal will have any impact on this site.

**TABLE 22: PROGRESS WITH COMMITMENT (HERITAGE)**

| Commitment | Description  | Responsibility | Timing  |
|------------|--|----------------|---|
| 11.        | An unanticipated discovery plan will be invoked if an item or site with suspected Aboriginal heritage values is encountered. | Operator       | During any future stripping or clearing activities. |

### 16 SITE OF HIGH PUBLIC INTEREST

There are no sites of high public interest located in the vicinity of the Tunbridge Tier Quarry.

## 17 REHABILITATION

Progressive rehabilitation techniques will be applied to maintain a maximum disturbed area of 6.0 hectares. As extractive areas become 'worked out' these will be progressively rehabilitated to gradually reduce the total area of disturbance.

### 17.1 PROGRESSIVE REHABILITATION

The new permit to expand the quarry operation facilitated limited clearing in new areas. The vegetation was stripped and topsoil and overburden materials were stored in windrows in the future to rehabilitate the area on the southern side of the existing and new workings. These new windrows were kept low and linear to resemble an extension of the natural landform.

#### 17.1.1 PREPARATION

Where the old and new overburden windrows meet, the existing topsoil was pulled back. The topsoil recovered from the footprint of the new overburden windrow was stockpiled separately. The new overburden was placed against the old windrow and the alignment continued to screen the entire southern side of the quarry site.

#### 17.1.2 EARTHWORKS

Vegetation cleared from the footprint of the proposed area of quarry development was the minimum necessary to facilitate access. In most cases the vegetation communities were ground covers and grasses and were stripped with the topsoil. The overburden was then recovered from the footprint and placed in a low windrow in the area previously prepared. The windrow is low (1 to 2 metres) and has low side slopes 1 in 3 max. to reduce erosion potential. The final windrow profile had the topsoil and vegetation spread over its new surface.

#### 17.1.3 REVEGETATION

The stripping including topsoil from the quarry expansion area was placed over the surface of the overburden stockpiles and disturbed ground. The vitality of the soil and included vegetative matter is improved by minimising the delay between recovery and placement.

A combination of the included seed and windblown seed from the surrounding pastures and sparse woodlands surrounding the site is likely to provide sufficient vegetation cover for these surfaces. If after 12 months exposure the surface has not been covered sufficiently, direct seeding will be applied to supplement natural recruitment.

**TABLE 23: PROGRESS WITH COMMITMENT (REHABILITATION)**

| Commitment | Description   | Responsibility | Timing                             |
|------------|---|----------------|------------------------------------|
| 12.        | If natural recruitment over rehabilitated area has not provided adequate cover after 12 months direct seeding will be applied to supplement revegetation. | Operator       | 12 months following rehabilitation |

#### 17.1.4 AFTER-CARE

The operator will continue to be responsible for maintenance of the Tunbridge Tier Quarry site for the duration of its operational life.

### 17.1.5 MAINTENANCE

The rehabilitation site will require minimal maintenance once the woodland vegetation is established. Until that time, it will be necessary to care for the planting by supplementary direct seeding areas of the rehabilitation effort that have failed.

It will be necessary to regularly inspect the site for weeds and an annual weed control program will be required.

### 17.1.6 MONITORING

The sediment control infrastructure including drains, culverts and the sediment retention basin will require monitoring until such time as the site has been decommissioned. Periodic visual inspections will assess the volume of storage capacity in the retention basin and if the capacity has been reduced by half the basin will be cleaned out.

## 17.2 DECOMMISSIONING AND REHABILITATION

At the end of the productive life of the Tunbridge Tier Quarry the site will be rehabilitated. The final use for the land will be grazing pasture for sheep. The faces have been cut from dolerite rock and will be stable. The actual height of the faces will be reduced by placing overburden material along the toe and against the face. The faces and benches will be planted out with species to resemble the *Eucalyptus pauciflora* woodland as found on the steeper ground surrounding the site.

### 17.2.1 REHABILITATION ACTIVITIES

The final rehabilitation effort will follow a similar process as that described above for the progressive rehabilitation areas:

- The final slope of the faces will be reduced by angling the last set of drill holes.
- Overburden and unsuitable materials will be placed at the toes of batters.
- The quarry floor and benches will be ripped where possible.
- Topsoil stockpiles will be spread over the surfaces.
- Direct seeding will be undertaken where natural recruitment has been insufficient.
- The Operator will maintain the revegetation effort until it is self-sustaining.

The objective of the final rehabilitation works will be to return the entire site within the Mining Lease boundary to rough grazing land with a combination of native and exotic pasture grasses in consultation with the landowner.

The faces and benches will be revegetated with natural recruitment and direct seeding and planting to provide a cover that will resemble *Eucalyptus pauciflora* woodland. The sediment retention facility and standing areas will be rehabilitated with pasture grasses or a low *Acacia-Bursaria* woodland and scrub plant mix. Species seeded and planted can be selected from the list in the planting schedules below.

### 17.2.2 MONITORING

Drains will be inspected for blockages and remedial action undertaken where required. Once vegetation ground cover is established overland flow can resume and the sediment control infrastructure will be redundant and can be removed.

TABLE 24: PROGRESS WITH COMMITMENT (REHABILITATION)

| Commitment | Description   | Responsibility | Timing       |
|------------|---|----------------|--------------|
| 13.        | The Operator will continue to maintain the rehabilitated area until a self-sustaining vegetation community is achieved. | Operator       | Upon closure |

TABLE 25: PLANTING SCHEDULE QUARRY BENCHES REHABILITATION (CANOPY)

| Species                      | Common Name | Planting density            |
|------------------------------|-------------|-----------------------------|
| <i>Eucalyptus pauciflora</i> | cabbage gum | 1 plant per 9 square metres |
| <i>Eucalyptus ovata</i>      | black gum   | 1 plant per 9 square metres |
| <i>Eucalyptus viminalis</i>  | white gum   | 1 plant per 9 square metres |

TABLE 26: PLANTING SCHEDULE QUARRY BENCHES REHABILITATION (MID STOREY)

| Species                 | Common Name   | Planting density            |
|-------------------------|---------------|-----------------------------|
| <i>Arcacia dealbata</i> | silver wattle | 1 plant per 6 square metres |
| <i>Bursaria spinosa</i> | prickly box   | 1 plant per 6 square metres |

TABLE 27: PLANTING SCHEDULE QUARRY BENCHES REHABILITATION (UNDERSTOREY - GROUND COVER)

| Species                   | Common Name          | Planting density            |
|---------------------------|----------------------|-----------------------------|
| <i>Themeda triandra</i>   | kangaroo grass       | 1 plant per 3 square metres |
| <i>Poa rodwayi</i>        | velvet tussock grass | 1 plant per 3 square metres |
| <i>Austrostipa nodosa</i> | knotty speargrass    | 1 plant per 3 square metres |
| <i>Austrostipa scabra</i> | sickle speargrass    | 1 plant per 3 square metres |

## PART D – MANAGEMENT COMMITMENTS

TABLE 28: COMMITMENTS

| Commitment | Description   | Responsibility      | Timing  |
|------------|---|---------------------|---|
| 1.         | Future stripping will be undertaken with consideration to the boundaries of the various vegetation communities on the fringe of the development area.     | Operator            | As required to facilitate the mining plan.          |
| 2.         | All existing preservation fencing will be retained for the life of the quarry.  | Operator            | At all times  |
| 3.         | Future clearing will be contained within approved future development area. No future permits are anticipated  | Operator            | For the life of the quarry.                         |
| 4.         | The existing Weed Management Plan will remain current.  | Operator            | For the life of the quarry.                         |
| 5.         | All existing stormwater and sediment control infrastructure will be maintained.   | Operator            | For the life of the quarry.                         |
| 6.         | Strategies will be employed to minimise the impact of dust emissions.   | Operator            | During all future operational campaigns.            |
| 7.         | The quarry development plan will retain the existing ridgeline on the south side to attenuate noise for receptors to the south.                           | Operator            | For all future quarry development.                  |
| 8.         | Blasting will be conducted in accordance with a documented Blast Management Plan.   | Blasting Contractor | For each successive blast                           |
| 9.         | The recommendations of the TIA (Eaton T, Dec 2015) are fully implemented.   | Proponent           | Existing installations will be maintained.          |
| 10.        | A hydrocarbon spill kit will be made available on site for immediate deployment during each extractive campaign.  | Operator            | For each successive campaign.                       |
| 11.        | An unanticipated discovery plan will be invoked if an item or site with suspected Aboriginal heritage values is encountered.                              | Operator            | During any future stripping or clearing activities. |
| 12.        | If natural recruitment over rehabilitated area has not provided adequate cover after 12 months direct seeding will be applied to supplement revegetation. | Operator            | 12 months following rehabilitation                  |
| 13.        | The Operator will continue to maintain the rehabilitated area until a self-sustaining vegetation community is achieved.                                   | Operator            | Upon closure  |

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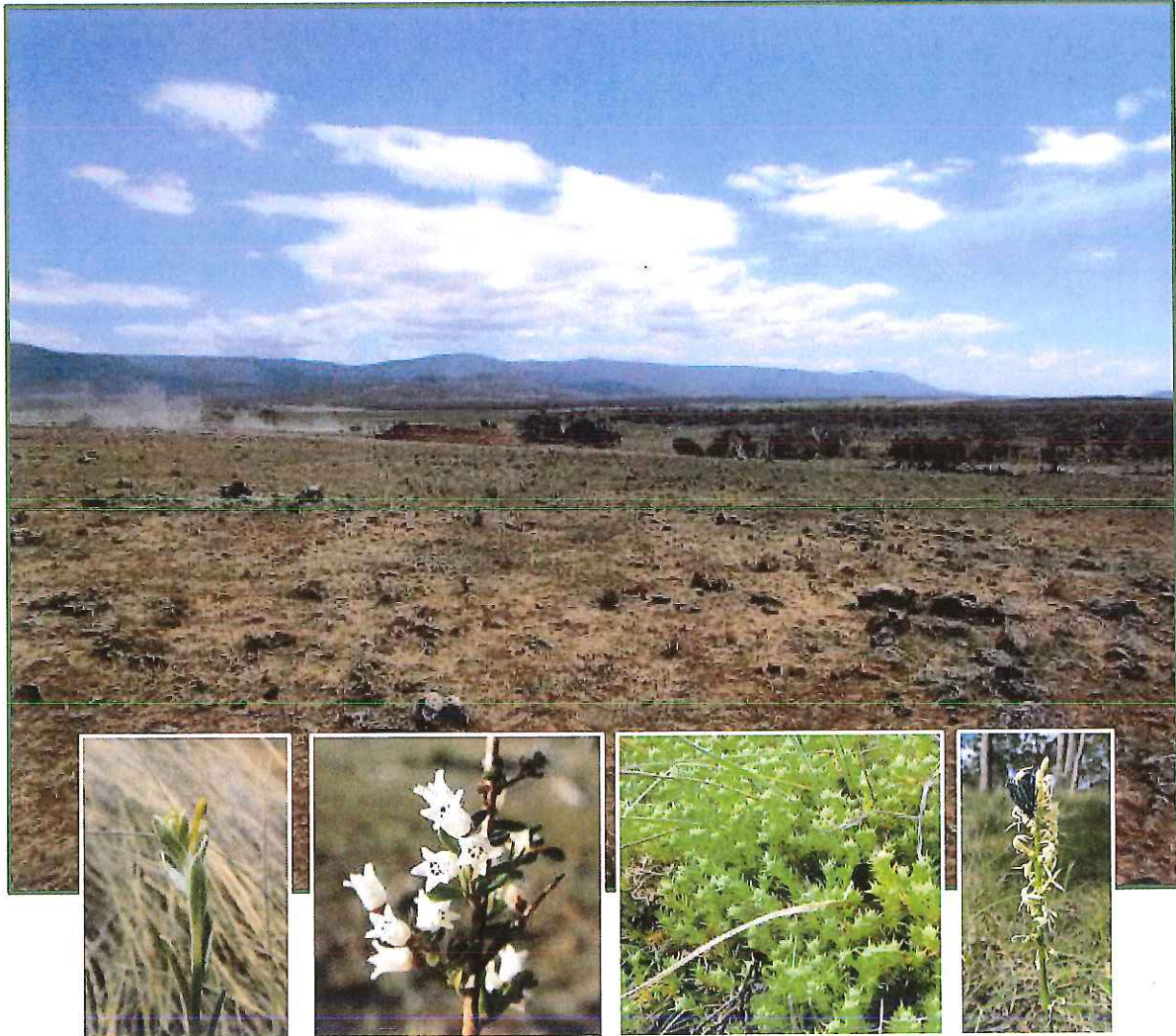
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# Environmental Consulting Options Tasmania

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## ECOLOGICAL ASSESSMENT OF TUNBRIDGE TIER ROAD DOLERITE QUARRY, TUNBRIDGE, TASMANIA



**Environmental Consulting Options Tasmania (ECOtas) for  
Hazell Bros. Group Pty Ltd**

**15 November 2015**

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**COVER ILLUSTRATIONS**

Main image: view across sheep-grazed grassland/pasture proposed for quarry expansion with existing quarry in background. Insets (L-R): *Pimelea* sp. Tunbridge, *Cryptandra amara*, *Scleranthus diander*, *Stackhousia subterranea* – threatened flora that occur on the edges of the proposed quarry extension area.

Please note: the blank pages in this document are deliberate to facilitate double-sided printing.



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## SUMMARY

### General

Hazell Bros. Group Pty Ltd engaged Environmental Consulting Options Tasmania (ECOtas) to undertake an assessment of the ecological values of the lease area associated with a dolerite quarry on private land off Tunbridge Tier Road, Tunbridge, Tasmania, to ensure that the requirements of the identified ecological values are appropriately taken into account during further project planning and under local, State and Commonwealth government approval protocols.

### Summary of key findings

#### Threatened flora

- No plant species listed as threatened on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* were recorded from the lease area. Two plant species listed on the Act are known from database records but could not be located (*Colobanthus curtisiae*, grassland cupflower; *Leucochrysum albicans* var. *tricolor*, grassland paperdaisy). Both records are not located within the area proposed for quarry extension. Potential habitat is present for additional plant species listed on the Act but targeted timed surveys have failed to detect such species.
- Ten plant species, listed as threatened on the Tasmanian *Threatened Species Protection Act 1995*, were detected within the lease area, but only three are located in areas that will be disturbed by future quarry expansion activities, as follows:
  - *Arthropodium strictum* (chocolate lily): localised to south-facing slope (will not be disturbed);
  - *Austrostipa nodosa* (knotty speargrass): extensive across pasture, rockplate grassland and old quarry floors/faces and along access tracks (will need to be disturbed);
  - *Austrostipa scabra* subsp. *falcata* (sickle speargrass): as above;
  - *Cryptandra amara* (pretty pearlflower): localised to two patches on rocky outcrops at eastern end of proposed quarry expansion area (can be practically excluded from disturbance);
  - *Scleranthus diander* (tufted knawel): two small patches just east of existing access track (suggested protective fencing required to minimise risk of inadvertent disturbance);
  - *Stackhousia subterranea* (grassland candles): several patches on south-facing slopes ((will not be disturbed);
  - *Vittadinia burbridgeae* (smooth new-holland-daisy): small patch just east of existing access track (suggested protective fencing required to minimise risk of inadvertent disturbance);
  - *Vittadinia cuneata* var. *cuneata* (fuzzy new-holland-daisy): one patch on rocky ridgeline southeast of existing quarry (can be practically excluded from disturbance), one patch on edge of older quarry area (will not be disturbed) and one patch on edge of gravel track on existing quarry floor (will continue to be disturbed); and
  - *Vittadinia gracilis* (woolly new-holland-daisy): patches associated with rocky ridgeline (can be practically excluded from disturbance) and an old wattle in southeast of lease area (well away from disturbance).

- There are database records of an additional four species listed under the Act, as follows:
  - *Colobanthus curtisiae* (grassland cupflower): record is outside proposed quarry expansion area and species could not be located;
  - *Hyalosperma demissum* (moss sunray): database records nominally on eastern edge of existing quarry but species could not be located;
  - *Isoetopsis graminifolia* (grass cushion): as above; and
  - *Leucochrysum albicans* var. *tricolor* (grassland paperdaisy): record is outside proposed quarry expansion area and species could not be located.
- One species currently unlisted but that has been approved for listing as endangered under the TSPA was also detected, as follows:
  - *Pimelea* sp. Tunbridge (grassland riceflower): small population west of existing quarry (suggested protective fencing required to minimise risk of inadvertent disturbance);
- A permit to disturb *Austrostipa nodosa* and *A. scabra* will be required under Section 51 of the Tasmanian *Threatened Species Protection Act 1995* but this should be issued without restrictions based on the ecology of the species. A permit to disturb a small number of *Vittadinia cuneata* should also be applied for (or a variation to the existing permit obtained) for the population detected on the existing quarry floor.

#### Threatened fauna

- No fauna species listed as threatened on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* or the Tasmanian *Threatened Species Protection Act 1995* were detected, or are known from database records, from the lease area.
- The lease area is within the predicted/known range of several species, and supports potential habitat of these species, as follows:
  - *Sarcophilus harrisii* (Tasmanian devil): no evidence of species noted (e.g. scats, potential den sites – no massive rock outcrops present, only occasional old logs (all searched) and wombat/rabbit burrows (all shallow, blind and searched) – no potential denning habitat within likely quarry expansion area (open "grassland");
  - *Dasyurus maculatus* subsp. *maculatus* (spotted-tailed quoll): as above;
  - *Tyto novaehollandiae* subsp. *castanops* (Tasmanian masked owl): generally a low proportion of trees with large hollows (all searched with no evidence present) – no potential nesting habitat within likely quarry expansion area (open "grassland");
  - *Pseudemoia pagenstecheri* (tussock skink): patches of tussock grassland present – no potential habitat within likely quarry expansion area (open "grassland" without significant tussock development); and
  - *Perameles gunnii* subsp. *gunnii* (eastern barred bandicoot): extensive areas of potential habitat – habitat within likely quarry expansion area marginal due to rockiness and lack of tussock development (open "grassland").

#### Vegetation types

- The lease area supports several TASVEG mapping units, as follows:
  - *Eucalyptus amygdalina* forest and woodland on dolerite (DAD);
  - *Eucalyptus amygdalina* inland forest and woodland on Cainozoic deposits (DAZ);
  - *Bursaria-Acacia* woodland (NBA);
  - Lowland grassland complex (GCL);



- Lowland *Poa labillardierei* grassland (GPL);
  - Lowland *Themeda triandra* grassland (GTL);
  - Rockplate grassland (GRP);
  - Agricultural land (FAG); and
  - Extra-urban miscellaneous (FUM).
- DAZ is classified as threatened under Schedule 3A of the Tasmanian *Nature Conservation Act 2002* but the quarry expansion will not extend into this vegetation type.
  - GTL and GPL, while not classified as threatened under Schedule 3A of the Tasmanian *Nature Conservation Act 2002*, may equate to the EPBCA-listed *Lowland Native Grasslands of Tasmania* (Critically Endangered). The site assessment indicated that these TASVEG mapping units are not present within the area proposed for quarry expansion, which supports mainly FAG and GRP (not threatened).

### Weeds

- The lease area supports localised patches of plant species classified as "declared weeds" within the meaning of the Tasmanian *Weed Management Act 1999*, as follows:
  - *Ulex europaeus* (gorse): scattered patches along access track and around old quarry (not one in current use) and in east of lease area; and
  - *Carduus tenuifolius* (winged slender thistle) and *C. pycnocephalus* (slender thistle): scattered in grazed areas and in disturbed sites, usually associated with other non-declared thistle species.
- The current weed distribution does not present a significant risk to natural ecological values such as populations of threatened flora or the condition of native vegetation. The expansion of quarrying is unlikely to exacerbate the current weed status of the site. Stripping of topsoil will probably concentrate weed propagules and the opportunity for weeds to colonise disturbed ground, and these sites should be the focus of any weed control activities. Incorporating weed management into any management plan for the site is considered prudent.

### Plant disease

- No evidence of plant disease (*Phytophthora cinnamomi*, rootrot fungus; myrtle wilt; myrtle rust) was detected.
- No special management requirements are required in relation to these issues.

### Animal disease (chytrid)

- The study area is not known to support the frog chytrid pathogen.
- No special management requirements are required in relation to these issues (continued use of the water from the small dam on-site is acceptable).

## **Recommendations**

The recommendations provided below are a summary of those provided in relation to each of the ecological features described in the main report. The main text of the report, and supported appendices, provide the relevant context for the recommendations.

### *Vegetation types*

It is recommended that the proposed extension to the quarry exclude areas mapped as native forest/woodland and that the rocky ridgeline be used to define the limit of works (this means that higher priority native vegetation types are effectively wholly excluded).

### *Threatened flora*

A permit under the Tasmanian *Threatened Species Protection Act 1995* will be required for disturbance to some species through application to the Policy Conservation & Advice Branch (PCAB, DPIPWE).

Protection of populations of threatened flora that occur on the edge of the existing quarry and proposed extension area is recommend (e.g. fencing of some sort), and that periodic monitoring take place.

### *Threatened fauna*

There is limited potential habitat present for several State- and Commonwealth-listed fauna species but no known sites or specific habitat features (e.g. den, nests) requiring special management.

### *Weeds and disease*

It is recommended that every effort is made to minimise the risk of introducing weeds and/or disease to the site through application of strict machinery hygiene protocols – see guidelines in *Keeping It Clean: A Tasmanian Field Hygiene Manual to Prevent the Spread of Freshwater Pests and Pathogens* (Allan & Gartenstein 2010).

### *Legislation and policy*

No formal referral to the relevant Commonwealth government agency under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* is considered warranted.

A permit under the Tasmanian *Threatened Species Protection Act 1995* will be required for disturbance to some species through application to the Policy Conservation & Advice Branch (PCAB, DPIPWE).

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**PURPOSE, SCOPE, LIMITATIONS AND QUALIFICATIONS OF THE SURVEY****Purpose**

Hazell Bros. Group Pty Ltd engaged Environmental Consulting Options Tasmania (ECOtas) to undertake an assessment of the ecological values of the lease area associated with a dolerite quarry on private land off Tunbridge Tier Road, Tunbridge, Tasmania, to ensure that the requirements of the identified ecological values are appropriately taken into account during further project planning and under local, State and Commonwealth government approval protocols.

**Scope**

This report relates to:

- flora and fauna species of conservation significance, including a discussion of listed threatened species (under the Tasmanian *Threatened Species Protection Act 1995* and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*) potentially and actually present, and other species of conservation significance/interest;
- vegetation types (forest and non-forest, native and exotic) present, including a discussion of the distribution, condition, extent, composition and conservation significance of each community;
- plant and animal disease management issues;
- weed management issues; and
- a discussion of some of the policy and legislative implications of the identified ecological values.

This report follows the government-produced *Guidelines for Natural Values Surveys – Terrestrial Development Proposals* (DPIPWE 2015) in anticipation that the report (or extracts of it) may be used as part of various approval processes that will be required for works at the site.

The assessment also complies, in a general sense, with the Tasmanian EPA's *Environmental Effects Report* requirements. The report format will also be applicable to other assessment protocols as required the Commonwealth Department of the Environment (for any referral/approval that may be required under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*), should such referral be warranted.

**Limitations**

Many plant species have ephemeral or seasonal growth or flowering habits, or patchy distributions (at varying scales), and it is possible that some species were not recorded for this reason. However, every effort was made to sample the range of habitats present in the survey area to maximise the opportunity of recording the majority of species present (particular those of conservation significance). Late spring and into summer is usually regarded as the most suitable period to undertake the majority of botanical assessments. While some species have more restricted flowering periods, a discussion of the potential for the site to support these is presented. In this case, a preliminary site assessment undertaken on 14 July 2015 (ECOtas 2015) indicated a very high potential for threatened flora species to be present, and recommendations were made to (a) remove sheep grazing to maximise the opportunity to detect threatened flora (a sheep-

exclusion fence was subsequently erected to prevent access to much of the area), and (b) a schedule of targeted-timed surveys to coincide with the flowering period of several target species. As part of timing the subsequent surveys, nearby sites with known populations of target threatened flora were assessed to ensure site surveys coincided with the peak flowering events of many annual species. This included Township Lagoon (mainly for *Prasophyllum tunbridgense* but also several additional species), Campbell Town Golf Course (mainly for *Prasophyllum incorrectum* and *Caladenia anthracina* but also several additional species) and Nile Road private property (for *Stackhousia subterranea*). Site surveys were then coordinated to match the flowering of these target species.

The survey was also limited to vascular species: species of mosses, lichens and liverworts were not recorded. However, a consideration is made of threatened species (vascular and non-vascular) likely to be present (based on habitat information and database records) and reasons presented for their apparent absence.

Surveys for threatened fauna were practically limited to an examination of "potential habitat" (i.e. comparison of on-site habitat features to habitat descriptions for threatened fauna), and detection of tracks, scats and other signs.

### **Qualifications**

Except where otherwise stated, the opinions and interpretations of legislation and policy expressed in this report are made by the author and do not necessarily reflect those of the relevant agency. The client should confirm management prescriptions with the relevant agency before acting on the content of this report.

### **Permit**

Any plant material was collected under DPIPWE permit TFL 13066 (in the name of Mark Wapstra). Relevant data will be entered into DPIPWE's *Natural Values Atlas* database by the author. Some plant material will be lodged at the Tasmanian Herbarium by the author.

No vertebrate or invertebrate material was collected.

### **PROPOSAL**

The land use proposal is outlined in *Tunbridge Tier Quarry – Upgrade: Notice of Intent* (ILMP 2015). The key elements of the project, as they relate to the potential impact on ecological values and the level of assessment and reporting required, are outlined below, taken from the Notice of Intent.

The proposed layout of the Tunbridge Tier Quarry will remain similar to the existing layout. The access road and intersection with Tunbridge Tier Road will remain in the same locations. The existing quarry faces will be progressed in a easterly direction once the resource from the existing footprint is exhausted.

The quarry will continue to be a campaign style operation with extracting and crushing / screening campaigns producing stockpiles of the required products which will be depleted to supply to projects. The increase in production will be supplied through an increase in the scale and frequency of campaigns.

The Tunbridge Tier Quarry has the faces orientated towards the west. Stripping has been undertaken for a width of around 15 metres behind the top of the upper face.

There will be ample scope to win product by advancing the upper face and subsequently the lower face in an easterly direction.

Following on from the initial development work it will be necessary to strip overburden from the land immediately east of the existing stripped area. This land has dolerite bedrock outcropping over a substantial area. Overburden quantities will be small. It will be possible to develop two faces approximately 6 metres high and at least a 100 metres wide.

To access the deposit reserves fully it will be necessary to strip around 4 hectares of the land mapped as agricultural land to the east and north of the existing quarry face. The clearing will entail some loss of the native grassland that is represented on the rocky hillock. The clearing will be staged to ensure that the minimum area will be cleared to facilitate the required production.

The preliminary site assessment indicated that the key ecological issues that may constrain the proposal are: (a) the classification and extent of native grassland, and (b) the distribution of threatened flora. The quarry is currently in operation. The preliminary assessment indicated that much of the existing quarry (including the floor, walls, access track and site office areas) were dominated by two species of threatened flora (*Austrostipa nodosa*, knotty speargrass; *Austrostipa scabra* subsp. *falcata*, sickle speargrass). As such, Hazell Bros. applied for and obtained a permit to take under the Section 51 of the Tasmanian *Threatened Species Protection Act 1995*. This permit applies to only the current quarry area and operations and not the future quarry expansion.

## THE STUDY AREA

For the purposes of the assessment and report, the study area was defined as the entire lease area (Figure 1), even though only a portion of this lease area will be utilised for the quarry expansion.

The study area (Figures 1 & 2) is on private property on the north side of Tunbridge Tier Road, west of Tunbridge, Tasmania, centred on 531872mE 5336745mN (GDA94, Tunbridge 5233 1:25,000 series Tasmapi), accessed from an existing well-formed gravel road off Tunbridge Tier Road and serviced by an existing gravelled site office area.

The lease area comprises the existing quarry and sheep-grazed pastoral ground (actively sheep-grazed until the months of the assessment) interspersed with woodland/scrub (prickly box and wattle) dry eucalypt forest and woodland patches. The "pasture" is a mix of stock-grazed pasture and native grassland (the classification is discussed in detail).

The far eastern edge of the lease area has a very minor drainage depression (upper reaches of a minor tributary of the Blackman River) in pasture, well outside any area to be quarried. The western edge of the lease area has a more distinct drainage channel/floodplain (upper reaches of a tributary of the Blackman River), which includes a small farm dam, which is accessed by a small track from the quarry access road to obtain water for quarry purposes. Apart from drawing water from the dam, the western drainage feature will also be unaffected by quarry activities.

Elevation varies from c. 225 m a.s.l. to c. 245 m a.s.l..

Geology (which is discussed briefly here as it can affect classification of vegetation, and potential for threatened flora, and to a lesser extent threatened fauna) is mapped as (Figure 3):

- Jurassic-age "dolerite (tholeiitic) with locally developed granophyre" (geocode: Jd): most of low hill proposed for quarrying; and
- Quaternary-age "Quaternary sediments" (geocode: Qh): western part of lease area, mainly associated with the poorly-drained ground and adjacent slopes.

Field assessment confirmed this broad geological mapping, with extensive areas of surface outcropping of dolerite bedrock and extensive development of dolerite-rich regolith. Limited parts of the eastern part of the lease area, and more extensive parts of the western parts of the lease area, have a sandy substrate, confirming the Qh geological mapping. The patches of sandy soil in the eastern part of the lease area are interpreted by the author as windblown surface sand with the dominant influence on the vegetation remaining the underlying Jurassic dolerite.

Land tenure and other categorisations of the study area are as follows:

- private titles (PID 6832983; Title References 131849/1 and 131849/4);
- existing mining lease 1502P/M;
- Northern Midlands municipality, zoned as Rural Resource under the *Northern Midlands Interim Planning Scheme 2013*, and partly subject to the Priority Habitat Overlay (but not in areas subject to the quarry extension proposal);
- Northern Midlands Bioregion (according to the 5/6.1 boundaries used by most government agencies); and
- Southern Natural Resource Management (NRM) region.

The study area is bound by:

- private titles on eastern, northern and western boundaries (same landowner); and
- Tunbridge Tier Road on southern boundary.

## **METHODS**

### ***Nomenclature***

All grid references in this report are in GDA94, except where otherwise stated.

Vascular species nomenclature follows de Salas & Baker (2015) for scientific names and Wapstra et al. (2005+) for common names. Fauna species scientific and common names follow the listings in the cited *Natural Values Atlas* reports (DPIPWE 2015a).

Vegetation classification follows TASVEG 3.0, as described in *From Forest to Fjaeldmark: Descriptions of Tasmania's Vegetation* (Kitchener & Harris 2013).

### ***Preliminary investigation***

Available sources of threatened flora records, vegetation mapping and other potential environmental values were interrogated. These sources include:

- Tasmanian Department of Primary Industries, Parks, Water & Environment's *Natural Values Atlas* records for threatened flora and fauna (GIS coverage maintained by the author current as at date of report);
- Tasmanian Department of Primary Industries, Parks, Water & Environment's *Natural Values Atlas Report No. 64016 ECOTas\_HazellBros\_TunbridgeTier* for a point (531872mE 5336745mN) indicating the approximate centre of the mining lease area, buffered by 5 km, dated 13 July 2015 (DPIPWE 2015a) – Appendix C;
- Forest Practices Authority's *Biodiversity Values Database* report, specifically the species' information for grid reference centroid 531872mE 5336745mN (nominally the centroid of

the *Natural Values Atlas* search area), buffered by 5 km, hyperlinked species' profiles and predicted range boundary maps, dated 13 July 2015 (FPA 2015) – Appendix D;

- Commonwealth Department of the Environment's *Protected Matters Search Tool Report* for a point (-42.12219, 147.38576) indicating the approximate centre of the mining lease area defining the subject title, buffered by 5 km, dated 13 July 2015 (CofA 2015) – Appendix E;
- the TASVEG 3.0 vegetation coverage (as available through a GIS coverage);
- GoogleEarth and TheList aerial imagery (Figure 2); and
- other sources listed in tables and text as indicated.

### Field assessment

Field assessments were undertaken on the following dates:

|              |              |  |
|--------------|--------------|--|
| 14 Jul. 2015 | Mark Wapstra | Initial site reconnaissance to ascertain "fatal flaws" and determine a "way forward" for assessments and reporting |
| 3 Sep. 2015  | Mark Wapstra | Threatened flora surveys   |
| 29 Sep. 2015 | Mark Wapstra | Threatened flora surveys   |
| 30 Oct. 2015 | Mark Wapstra | Threatened flora surveys, vegetation type mapping  |
| 2 Nov. 2015  | Mark Wapstra | Final mapping of threatened flora populations  |
| 3 Nov. 2015  | Mark Wapstra | Re-GPSing of threatened flora sites.   |

### Botanical survey – threatened flora

The subject title was assessed by slow-walking meandering transects designed to sample the range of habitat types to maximise the opportunity of detecting populations of threatened flora. Where threatened flora were detected, hand-held GPS (Garmin Oregon 650) was used to waypoint the approximate centre and/or extent of the population (for more extensive populations). Absolute counts of individuals were made, where practical. The term "where practical" is applied because some plant species were impractical to count accurately due to high numbers and extent (e.g. *Austrostipa nodosa* and *Austrostipa scabra* subsp. *falcata*) or growth habit (e.g. *Stackhousia subterranea* is rhizomatous and counting emergent stems is not necessarily a true reflection of the number of individuals).

Existing database records of threatened flora from within the lease area were assessed by reference to the grid reference, precision and record notes (Figure xxx). These included the following:

- *Colobanthus curtisiae* (grassland cupflower), A. Pyrke, 1 Jan. 1990 (this is a nominal date only indicating a year of collection, not a day and month), 532112mE 5336483mN ± 50 m (this is a high level of precision for a record that is dubiously dated and nominally placed on the flats in the southeast corner of the lease area rather than a roadside verge, which is probably the more likely site of collection from a government employee);
- *Hyalosperma demissum* (moss sunray), L. Gilfedder, 1 Jan. 1995 (see notes above), 531912mE 5336683mN ± 100 m & (same location, precision) D. Ziegeler, 19 Oct. 1995 – this is an annual herb, often associated with rockplate grasslands so collection from somewhere on the rocky slope north of Tunbridge Tier Road is likely but whether it is as accurately placed as indicated is unknown (i.e. on the edge of the existing quarry) as it

seems more likely that the species would be associated with the rocky outcrops of the south-facing slope south of the quarry);

- *Isoetopsis graminifolia* (grass cushion) – details as above;
- *Leucochrysum albicans* var. *tricolor* (grassland paperdaisy), J.B. Kirkpatrick/L. Gilfedder, 1 Jan. 1994 (see notes above regarding dates in this format), 532012mE 5336583mN  $\pm$  100 m – the record is nominally placed in the grassy woodland southeast of the existing quarry but the date of collection and the location is of low precision, indicating that the collection could have been made in a wide area and not necessarily from the private property;
- *Stackhousia subterranea* (grassland candles), A.M. Buchanan, 23 Oct. 1985, 531812mE 5336583mN  $\pm$  100 m – this is nominally placed just south of the existing quarry and is probably placed relatively precisely as the collection is actually labelled “hill on N side of Tunbridge Tier Road, 4.3km from Midlands Highway”; and
- *Stackhousia subterranea* (grassland candles), A.M. Buchanan, 25 Nov. 1985 & 22 Dec. 1985, 532212mE 5336483mN  $\pm$  100 m – this is nominally placed in the small patch of forest adjacent to the drainage depression in the southeast of the lease area, which is probably somewhat inaccurate because the records are labelled “Tunbridge Tiers Road, 3km W of the Midlands Highway” suggesting roadside verge collections.

Where populations of threatened flora were detected metal pin markers were used to permanently mark the sites for future reference (populations of threatened *Austrostipa* species were not flagged as they were extensive).

### **Botanical survey – declared and environmental weeds**

Where “declared weeds”, within the meaning of the Tasmanian *Weed Management Act 1999*, or “environmental weeds” as considered by the author, were detected, hand-held GPS (Garmin Oregon 650) was used to waypoint the location of individuals (for single individuals or small but discrete patches) or approximate centre and/or extent of the population (for more extensive populations).

### **Botanical survey – vegetation classification**

Vegetation classification follows TASVEG 3.0, as described in Kitchener & Harris (2013). Vegetation was classified by meandering transects to identify vegetation transitions and marking with hand-held GPS (Garmin Oregon 650) for later comparison to aerial photography or key features (e.g. road verges, quarry edges, property boundaries, distinctive trees, drainage features, dams, etc.).

The classification of “grassland” areas was complex due to a long history of sheep grazing. Some areas are mapped as “agricultural land” (TASVEG code: FAG) and in the field presents as thistle-infested sheep-grazed “grassland” in a mosaic with more native grassland dominated by species of *Austrostipa* and *Themeda triandra*. The classification of the different types of “grassland” has potentially significant implications for future management as some classifications have a low priority for conservation management and others a very high priority for conservation management.



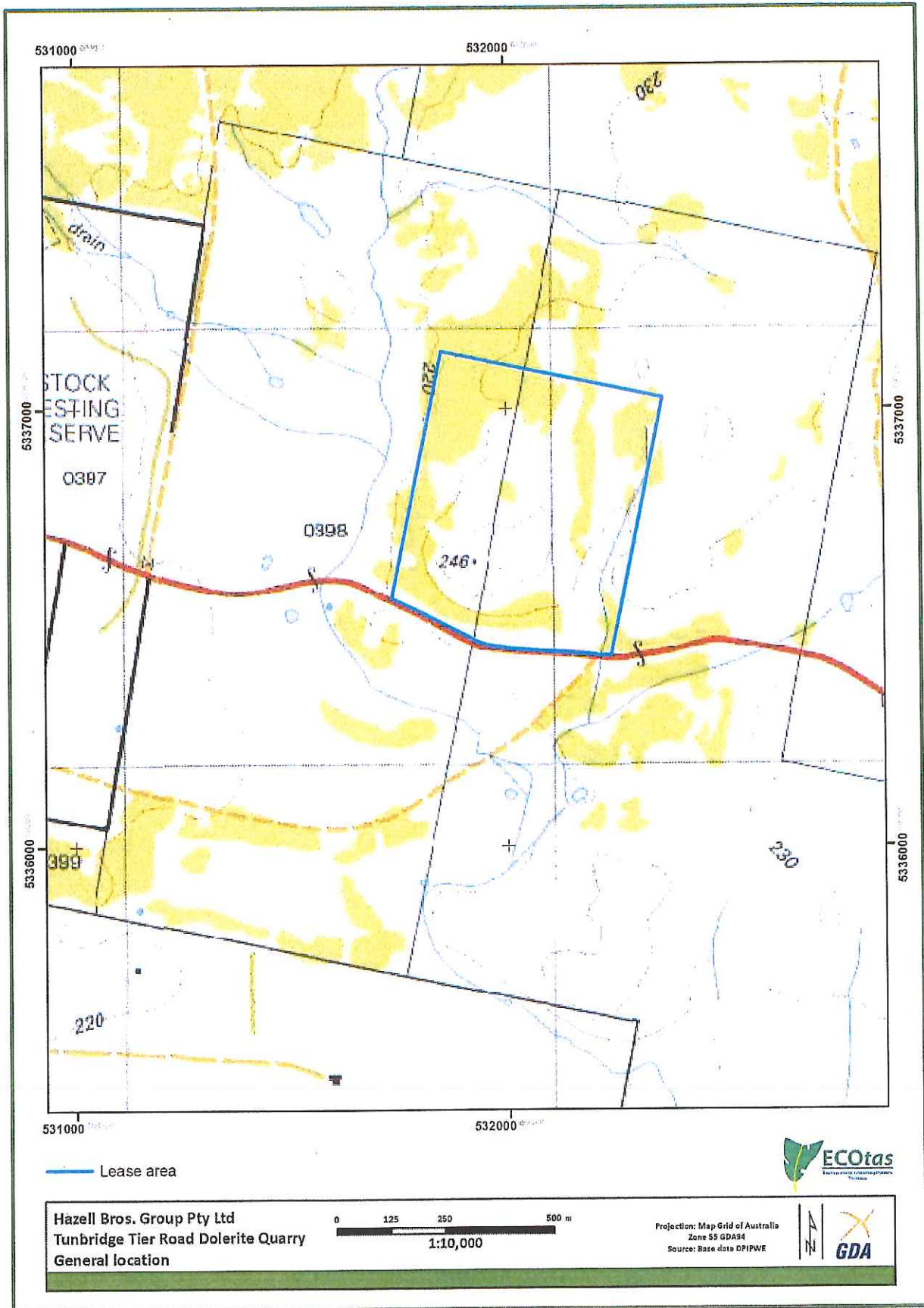


Figure 1. General location of lease area

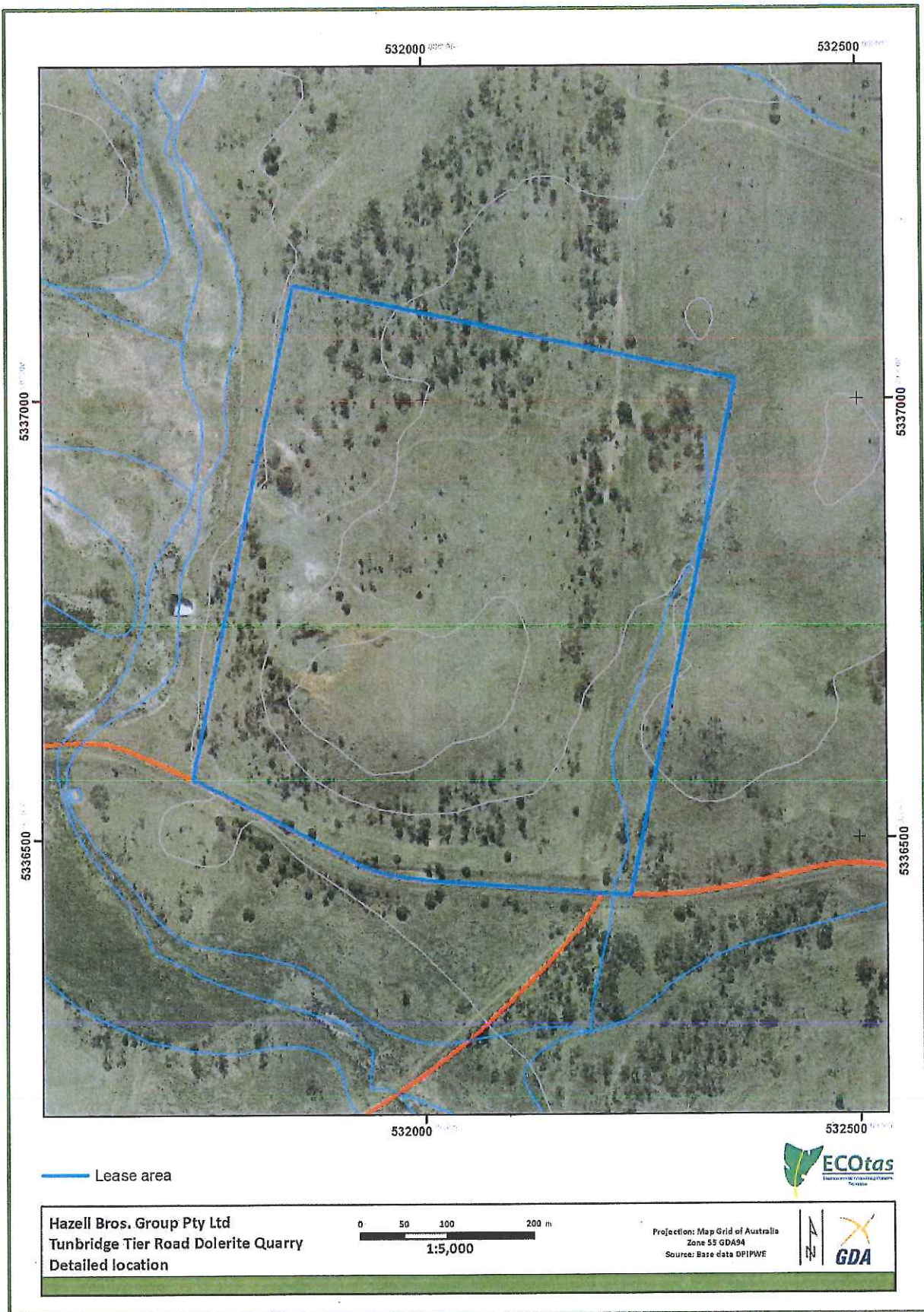


Figure 2. Detailed location of lease area showing aerial imagery

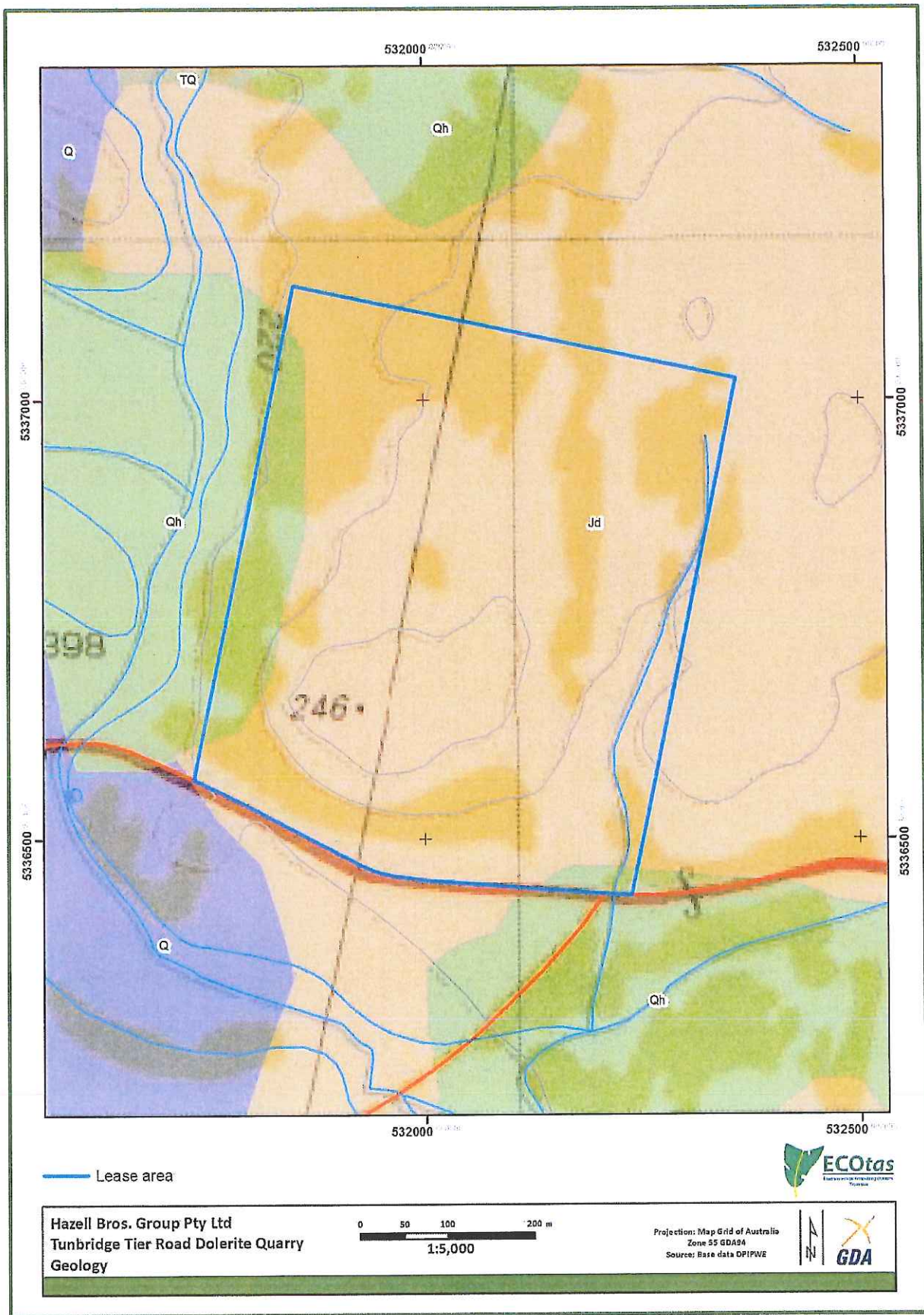


Figure 3. Geology of lease area

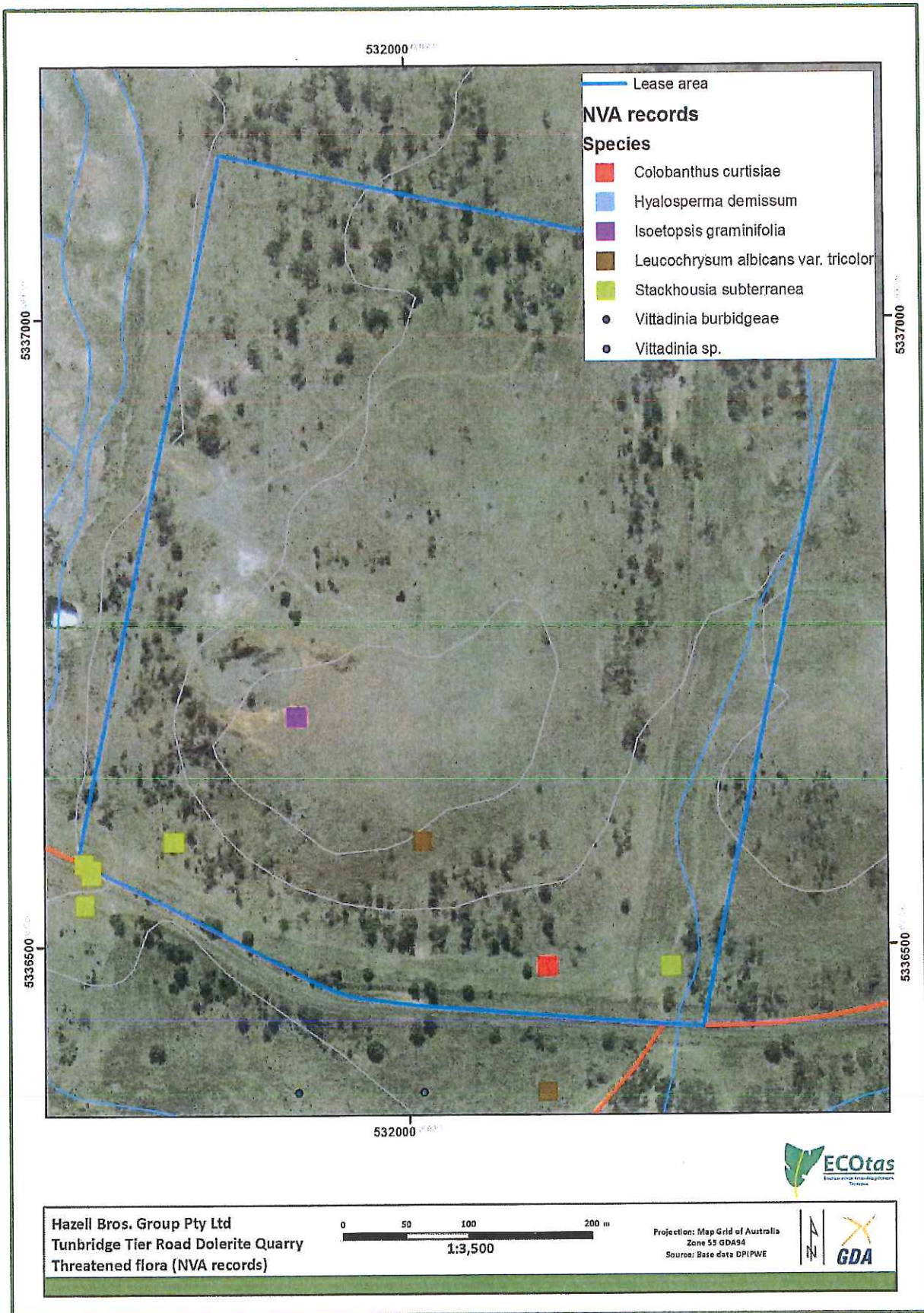


Figure 4. Existing NVA records of threatened flora from lease area and surrounds

## Zoological survey

Surveys for threatened fauna were practically limited to an examination of "potential habitat" (i.e. comparison of on-site habitat features to habitat descriptions for threatened fauna), and detection of tracks, scats and other signs, except as indicated below.

Surveys for the Tasmanian devil comply with the intent of *Survey Guidelines and Management Advice for Development Proposals that may impact on the Tasmanian Devil (Sarcophilus harrisii)* (DPIPWE 2015) because the surveys for threatened flora detection and mapping, and vegetation classification, meant that the study area was criss-crossed on numerous occasions (with the intent of as close to 100% coverage as practical)

## RESULTS

### Vegetation types

#### Comments on TASVEG mapping

This section, which comments on the existing TASVEG 3.0 mapping for the study area, is included to highlight the differences between existing mapping and the more recent mapping from the present study to ensure that any parties assessing land use proposals (via this report) do not rely on existing mapping. Note that TASVEG mapping, which was mainly a desktop mapping exercise based on aerial photography, is often substantially different to ground-truthed vegetation mapping, especially at a local scale. An examination of existing vegetation mapping is usually a useful pre-assessment exercise to gain an understanding of the range of habitat types likely to be present and the level of previous botanical surveys.

TASVEG mapping of grassland communities is notoriously inconsistent due to several interpreters being used and the influence of the degree of clarity of aerial imagery, especially if it does not accurately depict the level of grazing (heavily grazed ground can appear as dry native grassland).

TASVEG 3.0 maps the lease area as (see also Figure 5):

- "Eucalyptus rodwayi forest" (TASVEG code: DRO): areas shown as "green" on topographic maps and forest/woodland on aerial imagery;
- "agricultural land" (TASVEG code: FAG): cleared areas of "grassland" including the existing quarry area;
- "lowland grassland complex" (TASVEG code: GCL): small area in northeast and southeast of lease area;
- "lowland *Themeda triandra* grassland" (TASVEG code: GTL): small outcrop of native vegetation in the southeast of lease area; and
- "saline aquatic hermland" (TASVEG code: AHS): drainage flat in west of lease area (to be unaffected), contiguous with "saline sedgeland/rushland" (TASVEG code: ARS) that continues further south.

The mapping of DRO is inconsistent with geological mapping and topography and a good example of why TASVEG mapping needs to be ground-truthed as DRO is usually associated with broad flats with impeded drainage not well-drained rocky slopes. As intimated earlier, the classification of "grassland" areas will be discussed in detail below but suffice to say that the mapping of the entire area of open grassy habitat as "agricultural land" does not reflect the mosaic of pattern shown in

a range of ages of aerial imagery. The broad drainage flat on the western boundary of the lease area is correctly mapped as AHS and ARS, but these vegetation types probably do not extend properly into the lease area.

#### Vegetation types recorded as part of the present study

Vegetation types have been classified according to TASVEG 3.0, as described in *From Forest to Fjaeldmark: Descriptions of Tasmania's Vegetation* (Kitchener & Harris 2013). Table 1 summarises the vegetation types identified from the lease area. Figure 6 indicates the revised mapping of the vegetation within the study area.

The key management issue associated with the lease area is the extent of vegetation types with a priority for conservation management, especially those within the area into which the quarry will be extended. Most of the lease area has been extensively grazed and to a certain extent this has affected the composition of the vegetation. In addition, while the majority of the lease area is clearly underlain by Jurassic dolerite, some parts are overlain by (presumably) windblown sand. Quarrying will only occur in areas clearly underlain by dolerite.

The existing vegetation mapping in relation to forest and woodland classifications is entirely inaccurate (because no areas of *Eucalyptus rodwayi*-dominated forest are present: in fact no *Eucalyptus rodwayi* is present). Forested areas are dominated by *Eucalyptus amygdalina*, *Eucalyptus pauciflora* and *Eucalyptus viminalis*. The geological substrate affects the classification of these areas. Areas on dolerite are classified as "*Eucalyptus amygdalina* forest and woodland on dolerite" (TASVEG code: DAD), into which I have subsumed some limited areas dominated by *Eucalyptus amygdalina* mapped on dolerite but with a shallow covering of sand but some dolerite regolith still present. Areas dominated by *Eucalyptus pauciflora* occur mainly on sandy substrates and best match the concept of "*Eucalyptus amygdalina* inland forest and woodland on Cainozoic deposits" (TASVEG code: DAZ). DAD and DVG are not classified as threatened under Schedule 3A of the *Tasmanian Nature Conservation Act 2002* but DAZ is. No areas of forest or woodland are anticipated to be cleared such that there are no management implications because of the forest/woodland classification.

Small areas are locally dominated by *Bursaria spinosa* and can be classified as "*Bursaria-Acacia* woodland" (TASVEG code: NBA), although in practice some of these patches are quite small and essentially part of the forest and/or grassland mosaic (this is a minor problem when undertaking vegetation mapping at a relatively small scale).

This leaves the area of open "grassland" to classify. On initial assessment, I thought that the wide gentle swale east of the existing quarry may have reverted to being dominated by *Themeda triandra* after the removal of sheep. However, several months after stock removal, this area remains clearly dominated by species of thistle and introduced pasture grasses mixed with mainly *Austrostipa* species and *Themeda triandra* (but clearly not dominated by the latter). On this basis, this area has been mapped as "agricultural land" (TASVEG code: FAG) rather than a native grassland unit (the closest match would be "lowland grassland complex" (TASVEG code: GCL), which is not a threatened vegetation type).

Outside this more modified area of "grassland", the rock cover increases markedly, concomitant with an increase in dominance of *Austrostipa* species and *Themeda triandra*. The intersectional key to grassland mapping units separates off "rockplate grassland" (TASVEG code: GRP) in the first key couplet defined by "grassland vegetation associated with shallow soils on rockplates". In my opinion, the sites within the lease area clearly meet the intent of this description because of the obvious shallow soils and shallow bedrock of dolerite with some areas covered by a loose regolith rather than manifesting as rockplates *per se*. GRP is not classified as threatened under Schedule 3A of the *Tasmanian Nature Conservation Act 2002* and does not technically qualify as the EPBCA-listed Threatened Ecological Community *Lowland Native Grasslands of Tasmania*.

On slopes to the east (and some parts along the western boundary), the dominance of *Themeda triandra* is clear and the rock cover is much less. In my opinion, these areas are classifiable as "lowland *Themeda triandra* grassland" (TASVEG code: GTL). GTL is classified as threatened under Schedule 3A of the *Tasmanian Nature Conservation Act 2002* and may equate to the EPBCA-listed Threatened Ecological Community *Lowland Native Grasslands of Tasmania* (Critically Endangered) in some circumstances. In this case, the areas mapped as GTL are all outside the likely extent of quarry extension and as such no special management is required.

On slopes to the south and south east of the existing quarry, some areas are dominated by *Poa labillardierei* and essentially devoid of a eucalypt or tall shrub canopy, and therefore classifiable as lowland *Poa labillardierei* grassland" (TASVEG code: GPL). GPL is not classified as threatened under Schedule 3A of the *Tasmanian Nature Conservation Act 2002* but may equate to the EPBCA-listed Threatened Ecological Community *Lowland Native Grasslands of Tasmania* (Critically Endangered) in some circumstances. In this case, the areas mapped as GTL are all outside the likely extent of quarry extension and as such no special management is required.

Some areas of "grassland" that has been heavily sheep-grazed but retain a sparse cover of eucalypt stags (less than 1% cover) is difficult to classify because of the altered species composition. I am uncomfortable classifying these areas as GPL, GTL or GRP because they do not match the areas described above. As such, I have chosen to classify these sites into the (somewhat catch-all) of "lowland grassland complex" (TASVEG code: GCL).

**Table 1.** Vegetation mapping units present in lease area

[conservation priorities: NCA – as per Schedule 3A of the *Tasmanian Nature Conservation Act 2002*, using units described by Kitchener & Harris (2013), relating to TASVEG mapping units only (DPIPWE 2015b); table headings are as per modules in Kitchener & Harris (2013); EPBCA – as per the listing of ecological communities on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, relating to communities as described under that Act, but with equivalencies to TASVEG units; area approximate only]

| TASVEG mapping unit<br>(Kitchener & Harris 2013)  | Conservation<br>priority<br>NCA<br>EPBCA            | Comments              |
|---|---|-----------------------|
| <b>Dry eucalypt forest and woodland</b>   |   |                       |
| <i>Eucalyptus amygdalina</i><br>forest and woodland on<br>dolerite<br>(DAD)                     | Not threatened<br><i>Not threatened</i>             | See discussion above. |
| <i>Eucalyptus amygdalina</i><br>inland forest and<br>woodland on Cainozoic<br>deposits<br>(DAZ) | Threatened<br><i>Not threatened</i>                 | See discussion above. |
| <b>Non eucalypt forest and woodland</b>   |   |                       |
| <i>Bursaria-Acacia</i> woodland<br>(NBA)  | Not threatened<br><i>Not threatened</i>             | See discussion above. |
| <b>Native grassland vegetation</b>  |   |                       |
| Lowland grassland<br>complex<br>(GCL)   | Not threatened<br><i>Not threatened</i>             | See discussion above. |
| Lowland <i>Poa labillardierei</i><br>grassland<br>(GPL)   | Not threatened<br><i>Potentially<br/>threatened</i> | See discussion above. |

| TASVEG mapping unit<br>(Kitchener & Harris 2013)        | Conservation<br>priority<br>NCA<br>EPBCA        | Comments   |
|---|---|--|
| Lowland <i>Themeda triandra</i> grassland<br>(GTL)      | Not threatened<br><i>Potentially threatened</i> | See discussion above.  |
| Rockplate grassland<br>(GRP)                            | Not threatened<br><i>Not threatened</i>         | See discussion above.  |
| <b><i>Agricultural, urban and exotic vegetation</i></b> |   |  |
| Agricultural land<br>(FAG)                              | Not threatened<br><i>Not threatened</i>         | See discussion above.  |
| Extra-urban<br>miscellaneous<br>(FUM)                   | Not threatened<br><i>Not threatened</i>         | Areas of existing and old quarry are mapped as FUM, as well as the areas of existing gravel roads, parking areas and site offices. |

### **Plant species**

#### Priority flora species recorded from the lease area

Several species listed as threatened on the Tasmanian *Threatened Species Protection Act 1995* (TSPA) and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) were detected, or are known from database records, from the lease area. These are discussed below (alphabetically by scientific name).

- *Arthropodium strictum* (chocolate lily) [TSPA: rare; EPBCA: not listed]

This species was detected from a small number of sites in the grassy woodland on the south-facing slope south of the existing quarry. The initial observations were only of vegetative (non-flowering) material during September but surveys later in the season failed to detect flowering plants (despite numerous other sites in the Midlands having prolific flowering).

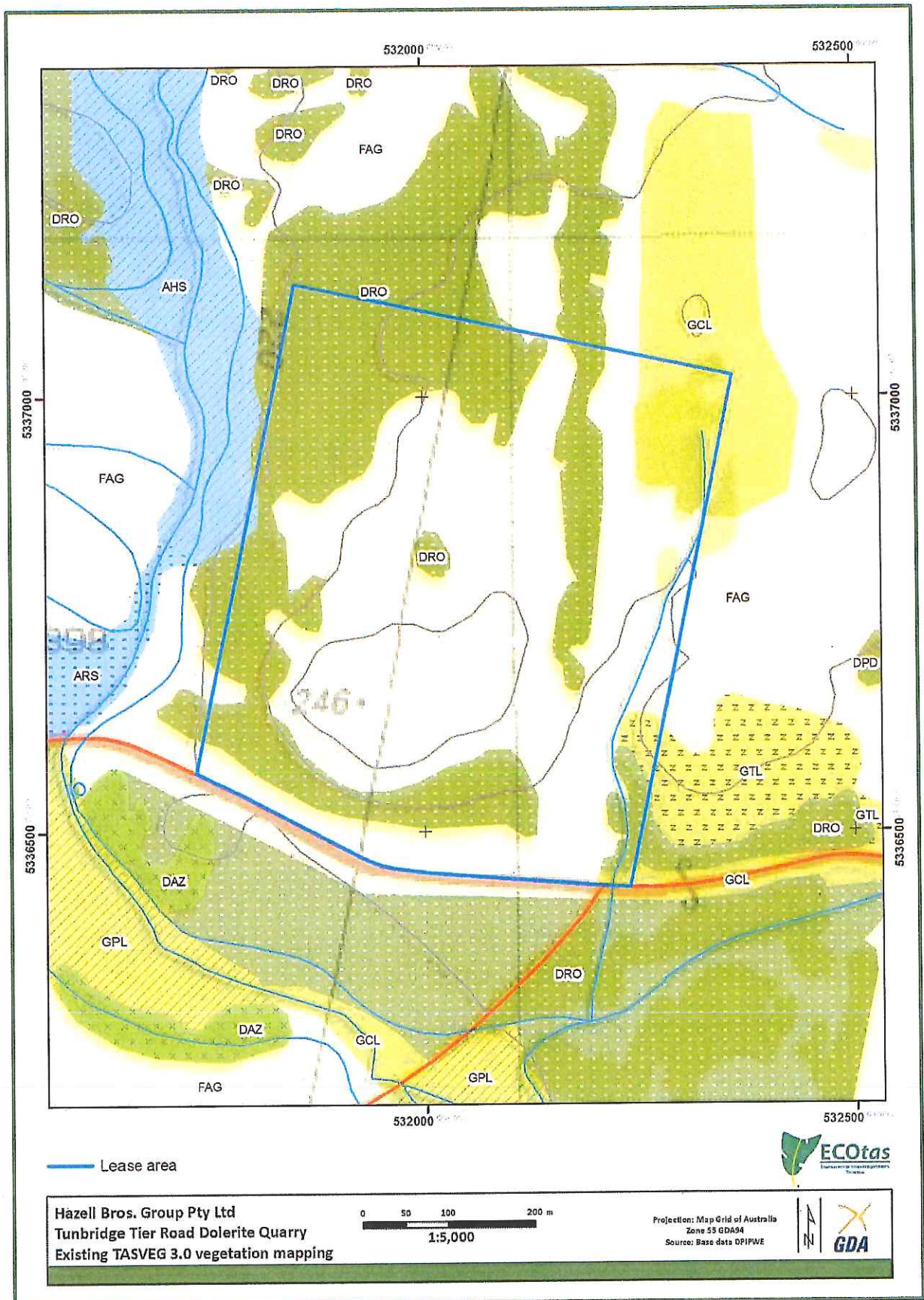
The proposed quarry expansion does not extend to any sites supporting this species so a permit under Section 51 of the TSPA will not be needed. The species has been accepted for removal from the TSPA (awaiting gazettal of decision) so further special management is not considered warranted. The sites have not been flagged.

- *Austrostipa nodosa* (knotty speargrass) [TSPA: rare; EPBCA: not listed]

This species is locally dominant over much of the lease area, particularly prevalent on disturbed sites such as the existing quarry floor and faces, access track and open grazed areas. It co-occurs with *Austrostipa scabra* (see below) and numerous other native grassland species. It appears to have been manifestly benefited by the disturbance from quarrying and grazing, being in lowest abundance in forested areas and better-developed pasture.

This species has been recommended for delisting from schedules of the TSPA by the Scientific Advisory Council and is awaiting formal gazettal of this. On this basis, and the fact that the species clearly responds positively to disturbance, no special management is recommended in relation to the future quarry expansion.





**Figure 5.** Existing TASVEG 3.0 vegetation mapping of lease area and surrounds

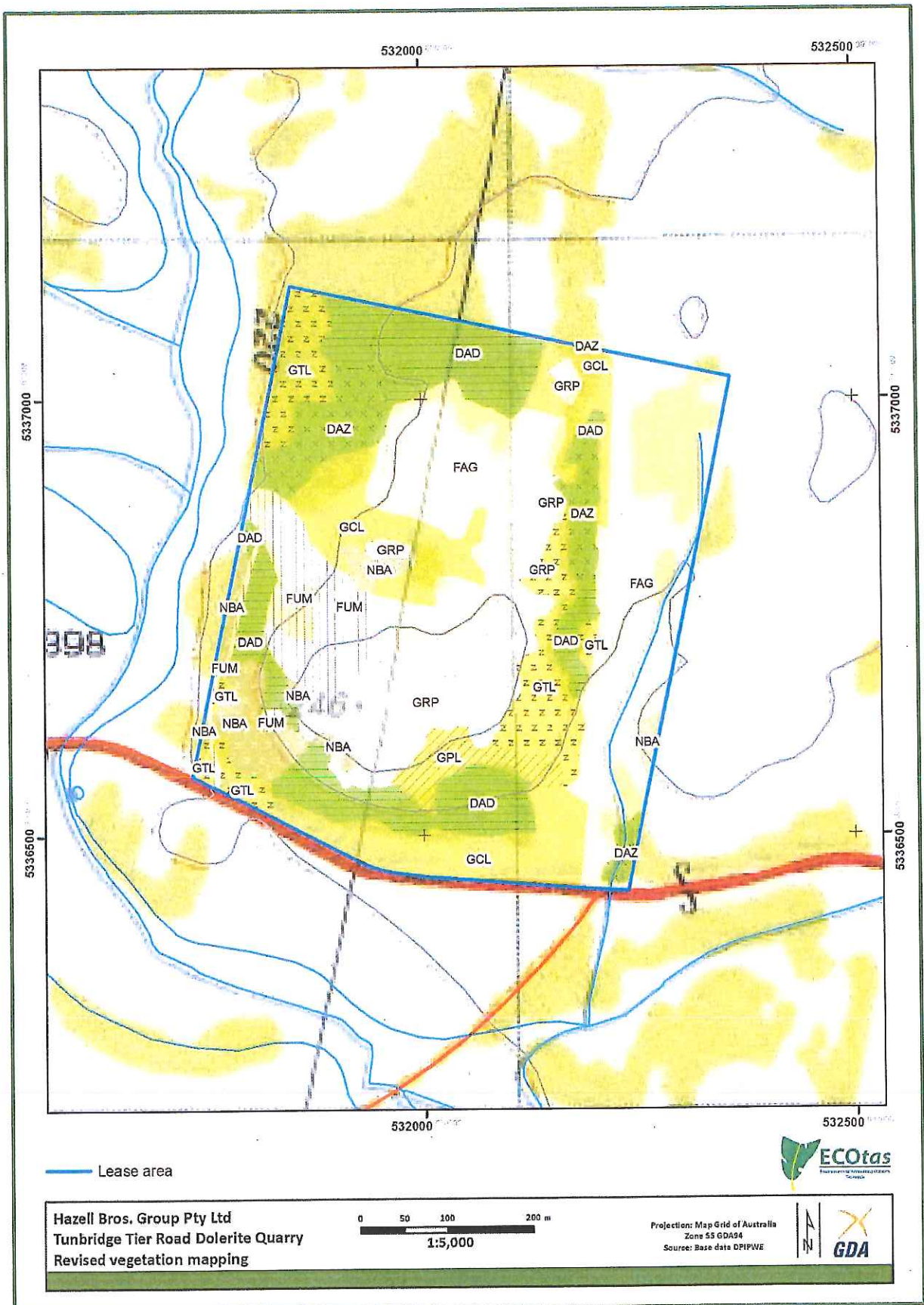


Figure 6. Revised vegetation mapping of lease area

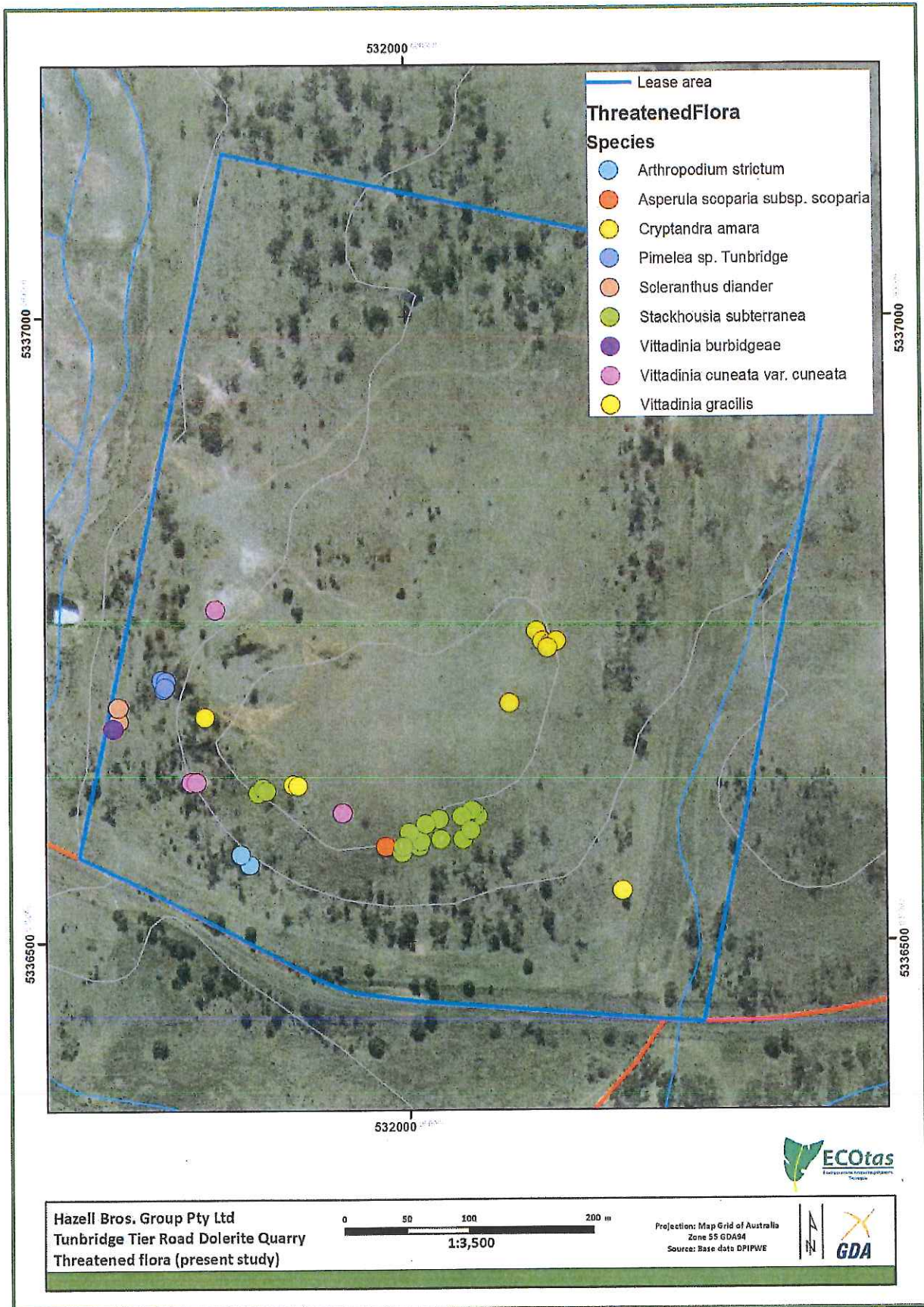


Figure 7. Distribution of threatened flora (present study only) from lease area

- *Austrostipa scabra* subsp. *falcata* (sickle speargrass) [TSPA: rare; EPBCA: not listed]

This species is locally dominant over much of the lease area, particularly prevalent on disturbed sites such as the existing quarry floor and faces, access track and open grazed areas. It co-occurs with *Austrostipa nodosa* (see above) and numerous other native grassland species. It appears to have been manifestly benefited by the disturbance from quarrying and grazing, being in lowest abundance in forested areas and better-developed pasture.

This species has recently been considered by the Scientific Advisory Committee and the infrataxonomic classification issues recognised (Tasmanian may only support subsp. *falcata* and not subsp. *scabra*) but the species has been retained on Schedule 5 (rare). I disagree with this, especially in comparison to *Austrostipa nodosa*, which I believe to be less widespread and disturbance-tolerant than *Austrostipa scabra*. My experience with this species is that it is being benefited by roadside slashing and grazing activities, installation of long pipelines and other activities that disturb grassy slopes. The species is often present in the 10s of 1000s, if not millions, often over many hectares of "paddock" or kilometres of road verge. At the subject site, it is extensive across much of the rockier ground, typical for this species. It is actively re-colonising heavily disturbed sites and any expansion of the quarry will result in the species becoming more dominant as the apparent primary coloniser after (and during) disturbance. On this basis, no special management is recommended in relation to the future quarry expansion.

- *Asperula scoparia* subsp. *scoparia* (prickly woodruff) [TSPA: rare; EPBCA: not listed]

One small patch of this species was found amongst dense grassy woodland on the slope south of the existing quarry. The site will not be disturbed by future quarry expansion works so a permit under Section 51 of the TSPA will not be required.

- *Colobanthus curtisiae* (grassland cupflower) [TSPA: rare; EPBCA: Vulnerable]

This species is only known from the lease area from an old database record with no vouchered specimen held at the Tasmanian Herbarium (A. Pyrke, 1 Jan. 1990 (this is a nominal date only indicating a year of collection, not a day and month), 532112mE 5336483mN  $\pm$  50 m (this is a high level of precision for a record that is dubiously dated and nominally placed on the flats in the southeast corner of the lease area rather than a roadside verge, which is probably the more likely site of collection from a government employee). The taxonomy of this species is somewhat confused because while it was originally known from a few scattered locations in lowland grasslands (and one higher elevation record), it is now known to be widespread and locally frequent on dolerite outcrops across the highlands. Its conservation status is in need of review. The species has a relatively long flowering period but is affected by drought conditions. Superficially suitable habitat is present along the rocky ridges and on the grassy slopes but the species was not detected despite several surveys.

The nominal position of the database record is not from within the quarry expansion area such that a permit under Section 51 of the TSPA is not technically required. In the absence of a known population and habitat within the proposed quarry expansion area being marginal due to a heavy grazing regime, a referral under the EPBCA is not considered warranted.

- *Cryptandra amara* (pretty pearlflower) [TSPA: endangered; EPBCA: not listed]

This species was detected from two patches on the rocky ridgeline in the east of the lease area. Both patches are associated with rocky outcrops and are at the edge of where the quarry may realistically expand to. The western limit of the patches have been pegged in the field. Provided that the rocky outcrops supporting the species are retained undisturbed, a permit under Section 51 of the TSPA will not be required. It is recommended, however, that the locations be more

formally protected prior to commencement of works close to the sites to minimise the risk of inadvertent impact (e.g. topsoil/spoil being placed on top). The management of these two sites coincides with the desire to keep the quarry activities shielded from direct view from Tunbridge Tier Road, such that retention of the rocky ridgeline serves dual purposes. In my opinion, a buffer of approximately 10 m from the edge of the rocky outcrop should be sufficient to appropriately protect these sites from the risk of inadvertent disturbance and indirect impacts (e.g. dust from adjacent quarrying works).

- *Hyalosperma demissum* (moss sunray) [TSPA: endangered; EPBCA: not listed]
- *Isoetopsis graminifolia* (grass cushion) [TSPA: vulnerable; EPBCA: not listed]

These species are both known only from database records, with two records for each species from the same location (L. Gilfedder, 1 Jan. 1995 (year accurate only), 531912mE 5336683mN  $\pm$  100 m & (same location, precision) D. Ziegeler, 19 Oct. 1995). As the species were detected by the same people on the same date from the same location, they are considered together in this section.

These annual herbs are often associated with rockplate grasslands so collection from somewhere on the rocky slope north of Tunbridge Tier Road is likely but whether it is as accurately placed as indicated is unknown (i.e. on the edge of the existing quarry) as it seems more likely that the species would be associated with the rocky outcrops of the south-facing slope south of the quarry. Despite several surveys that coincided with the flowering period of several threatened annual herbs at several locations in the greater Midlands (including Powranna Road Nature Reserve, Tom Gibson Nature Reserve, "Vaucluse" private reserve, Township Lagoon, Blessington area), these, or other, annual herbs were not detected from the lease area. Drought conditions may have contributed to this absence, or the species may have been eliminated by the grazing activities or some other factor. These annual herbs can flower erratically and be absent for many years from known sites, responding to seasonal conditions with a flourish of flowering.

In the absence of a confirmed site for these species, applying management actions to ensure their persistence is problematic. Technically, a permit under Section 51 of the TSPA will probably be needed because the records do fall on the edge of the existing quarry such that any expansion east would eliminate the nominal position of the sites. In my opinion, such a permit should be granted without conditions given the recent surveys failed to detect the species and there is no available information on the extent/abundance of the species that may be impacted. Loss of these sites, however, is unlikely to alter the conservation status of the species because both are being detected with increasing frequency from many novel sites. Informal extension surveys along the rocky ridge at the time of monitoring other threatened plant populations is recommended.

- *Leucochrysum albicans* var. *tricolor* (grassland paperdaisy) [TSPA: endangered; EPBCA: Endangered]

This species is only known from the lease area from an old database record with no vouchered specimen held at the Tasmanian Herbarium (J.B. Kirkpatrick/L. Gilfedder, 1 Jan. 1994 (this date format indicates the year is correct but the day and month not known), 532012mE 5336583mN  $\pm$  100 m). The record is nominally placed in the grassy woodland southeast of the existing quarry but the date of collection and the location is of low precision, indicating that the collection could have been made in a wide area and not necessarily from the private property in question. Given that the present surveys were deliberately timed for when the species was in flower (confirmed by reference to the known population at the nearby Township Lagoon) and it was not detected, it is reasonable to assume that the proposed quarry extension will not impact on any known sites for the species. The nominal position of the database record is not from within the quarry expansion area such that a permit under Section 51 of the TSPA is not technically required. In the absence of

a known population and habitat within the proposed quarry expansion area being marginal due to a heavy grazing regime, a referral under the EPBCA is not considered warranted.

- *Pimelea* sp. Tunbridge (grassland riceflower) [TSPA: pending; EPBCA: not listed]

This species is not yet formally described but is listed in the *Census of Vascular Plants of Tasmania* (de Salas & Baker 2015) as "*Pimelea* sp. Tunbridge (A.Moscal 9026) Tas Herbarium". It is most closely related to *Pimelea curviflora* and *Pimelea micrantha* but is restricted to a very small number of sites along Tunbridge Tier Road, Midland Highway north and south of Tunbridge, and Lake Leake Road. It has been considered by the Scientific Advisory Committee and a recommendation to list the species as endangered (Schedule 5) under the TSPA accepted (awaiting formal gazettal). As such, it is reasonable to treat this species as endangered for the purposes of management.

The detection of an additional population of this species is exciting and represents a minor range extension. It was detected on the grassy slopes amongst *Bursaria spinosa* shrubland between the access track and the existing quarry area. The continued use of the existing quarry and the proposed extension of the quarry to the east poses no significant risk to this population. Provided that the sites are not disturbed, no permit under Section 51 of the TSPA will be required. However, it is recommended that the site be more formally protected as soon as practical to minimise the risk of inadvertent disturbance (e.g. trucks turning around along access road, spoil spilling down from existing quarry) but erection of a post and wire (or similar) fence. Ideally, the fenced area should include the populations of *Vittadinia burbridgeae* and *Scleranthus diander*, which are located close to the access track. Periodic monitoring of these species by Hazell Bros. staff in conjunction with a suitably qualified ecologist is recommended, as this will supplement monitoring of the species by Threatened Plants Tasmania (Wildcare Inc.) and DPIPWE along Tunbridge Tier Road.

- *Scleranthus diander* (tufted knawel) [TSPA: vulnerable; EPBCA: not listed]

This species was detected from two nearby patches on the eastern side of the access track, on the edge of *Bursaria spinosa* (prickly box) woodland. No change to the access track is required so this site will remain undisturbed so a permit will not be required under Section 51 of the TSPA. It occurs near an area that also supports *Pimelea* sp. Tunbridge (soon to be listed as endangered under the TSPA) and *Vittadinia burbridgeae* (listed as rare under the TSPA), and therefore will be protected from disturbance by management recommendations made for those two species. That said, protection from disturbance is not strongly warranted (although this will be a by-product of managing other species that do warrant protection) because the species is not deleteriously affected by minor disturbance. The two patches have been pegged in the field.

- *Stackhousia subterranea* (grassland candles) [TSPA: endangered; EPBCA: not listed]

This species was known from the general area prior to the present assessments (A.M. Buchanan, 23 Oct. 1985, 531812mE 5336583mN  $\pm$  100 m, "hill on N side of Tunbridge Tier Road, 4.3km from Midlands Highway") but with no detailed population information. The present assessment identified several patches of different extent and abundance on the grassy slopes south and southeast of the existing quarry. These have all been pegged out for future reference. The proposed quarry extension will not extend beyond the rocky ridgeline (for visual management reasons) and therefore there is a very low risk of disturbance to these patches. The main risk is from inadvertent spillage of spoil over the slope although based on on-site discussions, this risk is considered negligible as the working area will finish well short of the ridgeline. Formally fencing the patches is probably not warranted, except for future reference (see comments on monitoring below). On this basis, a permit under Section 51 of the TSPA will not be required.

It is difficult to estimate the abundance of individuals in patches of *Stackhousia subterranea* because it has a rhizomatous growth habit and flowering stems are present and detectable for a

short period of the year only. Any abundance estimate probably (a) underestimates the number of stems present because of short and non-flowering stems being hidden amongst dense grass and (b) overestimates abundance because of the rhizomatous growth habit (M. Wapstra & L. Yeates unpubl. data from Nile site). It also appears that not all patches flower every season (M. Wapstra unpubl. data from Nile Road and Conara sites) meaning it is possible that additional patches will be detected on this grassy slope. However, it is unlikely that any such patches will be found in areas likely to be designated for quarrying because habitat becomes unsuitable just below the ridgeline (too rocky and exposed).

The presence of this endangered species close to an active quarry provides an opportunity to carefully manage the patches for their protection and closely monitor the annual variation in abundance of flowering stems. Periodic monitoring of these species by Hazell Bros. staff in conjunction with a suitably qualified ecologist is recommended, as this will supplement monitoring of the species by Threatened Plants Tasmania (Wildcare Inc.) and DPIPW along Tunbridge Tier Road and Township Lagoon.

- *Vittadinia burbridgeae* (smooth new-holland-daisy) [TSPA: rare; EPBCA: not listed]

This species was detected from a highly localised patch of only three plants (seedlings) about one metre east of the access track. It has not been marked because the site has not been re-located since it was first detected on 14 July 2015. No change to the access track is required so this site will remain undisturbed so a permit will not be required under Section 51 of the TSPA. It occurs in an area that also supports *Pimelea* sp. Tunbridge (soon to be listed as endangered under the TSPA) and *Scleranthus diander* (listed as vulnerable under the TSPA), and therefore will be protected from disturbance by management recommendations made for those two species. That said, protection from disturbance is not warranted (although will be a by-product of managing other species that do warrant protection) because the species responds positively to disturbance by forming extensive patches (e.g. verge of Tunbridge Tier Road for any hundreds of metres in several patches is locally dominated by the species).

- *Vittadinia cuneata* var. *cuneata* (fuzzy new-holland-daisy) [TSPA: rare; EPBCA: not listed]

This species was detected from three sites: on the existing gravel track within the quarry itself (about 15 plants flowering successfully despite vehicle and machinery passes and considerable dust); small patch on rocky ridgeline southeast of existing quarry (where it occurs near *Vittadinia gracilis*), and a small number of plants on the southern edge of the much older existing quarry southwest of the main quarry. Most of these patches will not be disturbed by the proposed quarry expansion. Technically, a permit under Section 51 of the TSPA should be obtained (or a variation sought to the existing permit) for further disturbance to the plants on the gravel road within the existing quarry.

- *Vittadinia gracilis* (woolly new-holland-daisy) [TSPA: rare; EPBCA: not listed]

This species was detected from three sites, two associated with the rocky ridgeline southeast of the existing quarry and one under an old black wattle in "rough pasture" near the southeast corner of the lease area. None of these sites will need to be affected by the proposed quarry extension so unless the rocky ridgeline patches are anticipated to be disturbed, a permit under Section 51 of the TSPA will not be needed. The patches have all been pinned in the field and these pins are recommended to form the outer limit of future quarry expansion, thus avoiding the need to disturb these plants.

Priority flora species potentially present (database analysis)

Table A1. (Appendix A) provides a listing of priority flora from within the study area, and from 500 m and 5000 m of the study area (nominal buffer widths usually used to discuss the potential of a particular study area to support various species listed in databases), with comments on whether potential habitat is present for the species, and possible reasons why a species was not recorded. Some species not listed on databases but considered by the author to have potential to occur in the survey area are also discussed.

Note that the field assessment was not restricted to the species listed in Table A1 but considered any threatened flora with the potential to be present. While the database analysis utilises a nominal buffer of 5000 m, the author's own experience of the vegetation and flora of the Midlands combined with database interrogation, meant that the specific potential for numerous other species previously recorded from the wider area were taken into account.

**Fauna species**Priority fauna species known from the study area

No fauna species, listed as threatened on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* or the Tasmanian *Threatened Species Protection Act 1995*, were detected, or are known from database records, from the study area.

The study area is within the predicted/known range of several species, and supports potential habitat of these species, as follows:

- *Sarcophilus harrisii* (Tasmanian devil): no evidence of species noted (e.g. scats, potential den sites – no massive rock outcrops present, only occasional old logs (all searched) and wombat/rabbit burrows (all shallow, blind and searched) – no potential denning habitat within likely quarry expansion area (open "grassland");
- *Dasyurus maculatus* subsp. *maculatus* (spotted-tailed quoll): as above;
- *Tyto novaehollandiae* subsp. *castanops* (Tasmanian masked owl): generally a low proportion of trees with large hollows (all searched with no evidence present) – no potential nesting habitat within likely quarry expansion area (open "grassland");
- *Pseudemoia pagenstecheri* (tussock skink): patches of tussock grassland present – no potential habitat within likely quarry expansion area (open "grassland" without significant tussock development); and
- *Perameles gunnii* subsp. *gunnii* (eastern barred bandicoot): extensive areas of potential habitat – habitat within likely quarry expansion area marginal due to rockiness and lack of tussock development (open "grassland").

Priority fauna species potentially present (database analysis)

Table B1 (Appendix B) provides a listing of priority fauna from within the study area, and from 500 m and 5000 m of the study area (nominal buffer widths usually used to discuss the potential of a particular study area to support various species listed in databases), with comments on whether potential habitat is present for the species, and possible reasons why a species was not recorded.

**Other ecological values**



Weed species

The lease area supports localised patches of plant species classified as "declared weeds" within the meaning of the Tasmanian *Weed Management Act 1999*, as follows:

- *Ulex europaeus* (gorse): scattered patches along access track and around old quarry (not one in current use) and in east of lease area; and
- *Carduus tenuifolius* (winged slender thistle) and *C. pycnocephalus* (slender thistle): scattered in grazed areas and in disturbed sites, usually associated with other non-declared thistle species.

The current weed distribution does not present a significant risk to natural ecological values such as populations of threatened flora or the condition of native vegetation. The expansion of quarrying is unlikely to exacerbate the current weed status of the site. Stripping of topsoil will probably concentrate weed propagules and the opportunity for weeds to colonise disturbed ground, and these sites should be the focus of any weed control activities. Incorporating weed management into any management plan for the site is considered prudent.

Rootrot pathogen, *Phytophthora cinnamomi*

*Phytophthora cinnamomi* (PC) is widespread in lowland areas of Tasmania, across all land tenures. However, disease will not develop when soils are too cold or too dry. For these reasons, PC is not a threat to susceptible plant species that grow at altitudes higher than about 700 metres or where annual rainfall is less than about 600 mm (e.g. Midlands and Derwent Valley). Furthermore, disease is unlikely to develop beneath a dense canopy of vegetation because shading cools the soils to below the optimum temperature for the pathogen. A continuous canopy of vegetation taller than about 2 metres is sufficient to suppress disease. Hence PC is not considered a threat to susceptible plant species growing in wet sclerophyll forests, rainforests (except disturbed rainforests on infertile soils) and scrub e.g. teatree scrub (Rudman 2005; FPA 2009).

The study area is in part of the State not usually regarded as suitable for the pathogen.

Myrtle wilt

Myrtle wilt, caused by a wind-borne fungus (*Chalara australis*), occurs naturally in rainforest where myrtle beech (*Nothofagus cunninghamii*) is present. The fungus enters wounds in the tree, usually caused by damage from wood-boring insects, wind damage and forest clearing. The incidence of myrtle wilt often increases forest clearing events such as windthrow and wildfire.

*Nothofagus cunninghamii* is absent from the study area.

Myrtle rust

No evidence of myrtle rust was noted.

Chytrid fungus and other freshwater pathogens

Native freshwater species and habitat are under threat from freshwater pests and pathogens including *Phytophthora cinnamomi* (root rot), *Batrachochytrium dendrobatidis* (Chytrid frog disease), *Mucor amphibiorum* (platypus Mucor disease) and the freshwater algal pest *Didymosphenia geminata* (Didymo) (Allan & Gartenstein 2010). Freshwater pests and pathogens

are spread to new areas when contaminated water, mud, gravel, soil and plant material or infected animals are moved between sites. Contaminated materials and animals are commonly transported on boots, equipment, vehicles tyres and during road construction and maintenance activities. Once a pest pathogen is present in a water system it is usually impossible to eradicate. The manual *Keeping it Clean - A Tasmanian Field Hygiene Manual to Prevent the Spread of Freshwater Pests and Pathogens* (Allan & Gartenstein 2010) provides information on how to prevent the spread of freshwater pests and pathogens in Tasmanian waterways wetlands, swamps and boggy areas.

There are no natural drainage features within the lease area that will be affected by the proposed quarry extension. Water is currently extracted from the small dam on the western edge of the lease area but is used on-site such that there is no transfer of water from one catchment to another, such that the disease-status of the dam is of no management significance.

#### Additional "Matters of National Environmental Significance" – Threatened Ecological Communities

The EPBCA *Protected Matters Area* report (CofA 2015) indicates that the Threatened Ecological Community *Lowland Native Grassland of Tasmania*, listed as Critically Endangered, is likely to occur within the report area.

Existing TASVEG 3.0 vegetation mapping does not indicate that any part of the lease area is mapped as native grassland, with all open "grassland" areas mapped as "agricultural land" (TASVEG code: FAG). Existing vegetation mapping is, however, only an indication of the finer-scaled classification of "grassland" communities that may be present in an area. A preliminary assessment of the lease area (ECOtas 2015) suggested that at least some parts of the lease area were classifiable as one or more TASVEG 3.0 native grassland mapping units. With the exclusion of sheep grazing for a period it was envisaged that any areas of incipient native grassland may have reverted quickly to a "natural" state. However, despite a relatively long period of no stock grazing, the mosaic of "grassland" types shifted little such that classification is presented "as is". In the absence of further grazing, it is possible that a greater shift to native grassland will occur. However, there is no specific reason that stock cannot be re-introduced to the presently fenced area and therefore it is suggested that this classification needs to be accepted because the quarry life will be up to 20 years such that a management decision needs to be made in the present.

Under *Lowland Native Grasslands of Tasmania – A Nationally Threatened Ecological Community*, *Environment Protection and Biodiversity Conservation Act 1999 Policy Statement 3.18*, the EPBCA-listed entity is defined to include the TASVEG 3.0 native grassland mapping units "lowland *Poa labillardierei* grassland" (TASVEG code: GPL) and "lowland *Themeda triandra* grassland" (TASVEG code: GTL). While some areas of GPL and GTL have been mapped from within the lease area, these vegetation type are absent from the likely quarry extension area. "Grassland" within the quarry extension area has been mapped as a combination of "agricultural land" (TASVEG code: FAG) and "rockplate grassland" (TASVEG code: GRP). On the basis that any areas of native grassland communities that may comprise the EPBCA-listed entity will not be quarried or materially affected by adjacent quarrying works, a referral under the EPBCA is not required.

#### Additional "Matters of National Environmental Significance" – Nationally Important Wetlands

The EPBCA *Protected Matters Area* report (CofA 2015) indicates that the Bells Lagoon may need to be considered. The lease area is not within the catchment of this lagoon.

## DISCUSSION

### Summary of key findings

#### Threatened flora

- No plant species listed as threatened on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* were recorded from the lease area. Two plant species listed on the Act are known from database records but could not be located (*Colobanthus curtisiae*, grassland cupflower; *Leucochrysum albicans* var. *tricolor*, grassland paperdaisy). Both records are not located within the area proposed for quarry extension. Potential habitat is present for additional plant species listed on the Act but targeted timed surveys have failed to detect such species.
- Ten plant species, listed as threatened on the Tasmanian *Threatened Species Protection Act 1995*, were detected within the lease area, but only three are located in areas that will be disturbed by future quarry expansion activities, as follows:
  - *Arthropodium strictum* (chocolate lily): localised to south-facing slope (will not be disturbed);
  - *Austrostipa nodosa* (knotty speargrass): extensive across pasture, rockplate grassland and old quarry floors/faces and along access tracks (will need to be disturbed);
  - *Austrostipa scabra* subsp. *falcata* (sickle speargrass): as above;
  - *Cryptandra amara* (pretty pearlflower): localised to two patches on rocky outcrops at eastern end of proposed quarry expansion area (can be practically excluded from disturbance);
  - *Scleranthus diander* (tufted knawel): two small patches just east of existing access track (suggested protective fencing required to minimise risk of inadvertent disturbance);
  - *Stackhousia subterranea* (grassland candles): several patches on south-facing slopes ((will not be disturbed);
  - *Vittadinia burbridgeae* (smooth new-holland-daisy): small patch just east of existing access track (suggested protective fencing required to minimise risk of inadvertent disturbance);
  - *Vittadinia cuneata* var. *cuneata* (fuzzy new-holland-daisy): one patch on rocky ridgeline southeast of existing quarry (can be practically excluded from disturbance), one patch on edge of older quarry area (will not be disturbed) and one patch on edge of gravel track on existing quarry floor (will continue to be disturbed); and
  - *Vittadinia gracilis* (woolly new-holland-daisy): patches associated with rocky ridgeline (can be practically excluded from disturbance) and an old wattle in southeast of lease area (well away from disturbance).
- There are database records of an additional four species listed under the Act, as follows:
  - *Colobanthus curtisiae* (grassland cupflower): record is outside proposed quarry expansion area and species could not be located;
  - *Hyalosperma demissum* (moss sunray): database records nominally on eastern edge of existing quarry but species could not be located;
  - *Isoetopsis graminifolia* (grass cushion): as above; and

- *Leucochrysum albicans* var. *tricolor* (grassland paperdaisy): record is outside proposed quarry expansion area and species could not be located.
- One species currently unlisted but that has been approved for listing as endangered under the TSPA was also detected, as follows:
  - *Pimelea* sp. Tunbridge (grassland riceflower): small population west of existing quarry (suggested protective fencing required to minimise risk of inadvertent disturbance);
- A permit to disturb *Austrostipa nodosa* and *A. scabra* will be required under Section 51 of the Tasmanian *Threatened Species Protection Act 1995* but this should be issued without restrictions based on the ecology of the species. A permit to disturb a small number of *Vittadinia cuneata* should also be applied for (or a variation to the existing permit obtained) for the population detected on the existing quarry floor.

#### Threatened fauna

- No fauna species listed as threatened on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* or the Tasmanian *Threatened Species Protection Act 1995* were detected, or are known from database records, from the lease area.
- The lease area is within the predicted/known range of several species, and supports potential habitat of these species, as follows:
  - *Sarcophilus harrisii* (Tasmanian devil): no evidence of species noted (e.g. scats, potential den sites – no massive rock outcrops present, only occasional old logs (all searched) and wombat/rabbit burrows (all shallow, blind and searched) – no potential denning habitat within likely quarry expansion area (open "grassland");
  - *Dasyurus maculatus* subsp. *maculatus* (spotted-tailed quoll): as above;
  - *Tyto novaehollandiae* subsp. *castanops* (Tasmanian masked owl): generally a low proportion of trees with large hollows (all searched with no evidence present) – no potential nesting habitat within likely quarry expansion area (open "grassland");
  - *Pseudemoia pagenstecheri* (tussock skink): patches of tussock grassland present – no potential habitat within likely quarry expansion area (open "grassland" without significant tussock development); and
  - *Perameles gunnii* subsp. *gunnii* (eastern barred bandicoot): extensive areas of potential habitat – habitat within likely quarry expansion area marginal due to rockiness and lack of tussock development (open "grassland").

#### Vegetation types

- The lease area supports several TASVEG mapping units, as follows:
  - *Eucalyptus amygdalina* forest and woodland on dolerite (DAD);
  - *Eucalyptus amygdalina* inland forest and woodland on Cainozoic deposits (DAZ);
  - *Bursaria-Acacia* woodland (NBA);
  - Lowland grassland complex (GCL);
  - Lowland *Poa labillardierei* grassland (GPL);
  - Lowland *Themeda triandra* grassland (GTL);
  - Rockplate grassland (GRP);
  - Agricultural land (FAG); and
  - Extra-urban miscellaneous (FUM).

- DAZ is classified as threatened under Schedule 3A of the Tasmanian *Nature Conservation Act 2002* but the quarry expansion will not extend into this vegetation type.
- GTL and GPL, while not classified as threatened under Schedule 3A of the Tasmanian *Nature Conservation Act 2002*, may equate to the EPBCA-listed *Lowland Native Grasslands of Tasmania* (Critically Endangered). The site assessment indicated that these TASVEG mapping units are not present within the area proposed for quarry expansion, which supports mainly FAG and GRP (not threatened).

#### Weeds

- The lease area supports localised patches of plant species classified as "declared weeds" within the meaning of the Tasmanian *Weed Management Act 1999*, as follows:
  - *Ulex europaeus* (gorse): scattered patches along access track and around old quarry (not one in current use) and in east of lease area; and
  - *Carduus tenuifolius* (winged slender thistle) and *C. pycnocephalus* (slender thistle): scattered in grazed areas and in disturbed sites, usually associated with other non-declared thistle species.
- The current weed distribution does not present a significant risk to natural ecological values such as populations of threatened flora or the condition of native vegetation. The expansion of quarrying is unlikely to exacerbate the current weed status of the site. Stripping of topsoil will probably concentrate weed propagules and the opportunity for weeds to colonise disturbed ground, and these sites should be the focus of any weed control activities. Incorporating weed management into any management plan for the site is considered prudent.

#### Plant disease

- No evidence of plant disease (*Phytophthora cinnamomi*, rootrot fungus; myrtle wilt; myrtle rust) was detected.
- No special management requirements are required in relation to these issues.

#### Animal disease (chytrid)

- The study area is not known to support the frog chytrid pathogen.
- No special management requirements are required in relation to these issues (continued use of the water from the small dam on-site is acceptable).

### **Legislative and policy implications**

Some commentary is provided below with respect to the key threatened species, vegetation management and other relevant legislation. Note that there may be other relevant policy instruments in addition to those discussed.

#### Tasmanian Threatened Species Protection Act 1995

Three plant species listed as threatened on the Tasmanian *Threatened Species Protection Act 1995* will be affected by the proposed quarry extension. Populations of other threatened plant species can be practically excluded from disturbance.

Threatened flora on this Act are managed under Section 51, where a permit is required to knowingly "take" (which includes kill, injure, catch, damage, destroy and collect), keep, trade in or process any specimen of a listed species. Where threatened flora are likely to be disturbed, it is usual to

apply for a permit under Section 51 of the Act on the required proforma to the Policy & Conservation Advice Branch (DPIPWE). This should only be submitted when a specific action is known such that details can be provided of the degree of anticipated impact on the species. Note that even activities that may benefit (or not materially impact on) a species can still require a permit. The present document should provide sufficient details to complete the permit proforma (e.g. extent of population, number of individuals). *Austrostipa nodosa* has been recommended for removal from the TSPA so may not need to be included in a permit application. The permit will need to refer to *Austrostipa scabra*, and also request advice in relation to *Hyalosperma demissum* and *Isoetopsis graminifolia*. A variation to the current permit for the existing quarry activities may be technically required in relation to *Vittadinia cuneata*. Note that it has been recommended that no special prescriptions be applied to a permit.

Potential habitat of threatened fauna is more complex to manage under Section 51 of the Act because unless works would result in the "taking" of a specimen, a permit under the Act is not technically possible. However, it is usual for development proposals involving the disturbance of potential habitat of threatened species listed on the Act to be referred to DPIPWE for advice. In the absence of being in a position to issue a permit under Section 51 of the Act, DPIPWE's Policy & Conservation Advice Branch (PCAB) may make recommendations to a development proponent in regard to managing habitat of threatened species and/or may endorse or comment on proposed offset/mitigation strategies. It is unlikely such a referral will be warranted because the main areas of potential habitat for any listed species will remain undisturbed.

#### Commonwealth Environment Protection and Biodiversity Conservation Act 1999

No flora species listed on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* were detected from within the lease area. There is some potential habitat for flora species listed on the Act within the lease area and older database records of such species (but not from within areas likely to be subject to quarry expansion).

There is potential habitat for several fauna species listed on this Act, namely *Dasyurus maculatus* subsp. *maculatus* (spotted-tailed quoll), *Sarcophilus harrisii* (Tasmanian devil), *Tyto novaehollandiae* subsp. *castanops* (Tasmanian masked owl), and *Perameles gunnii* subsp. *gunnii* (eastern barred bandicoot), although field survey failed to detect the presence (or evidence of the presence) of these species.

Some areas of native grassland within the lease area may qualify as the EPBCA-listed Threatened Ecological Community *Lowland Native Grasslands of Tasmania* but no areas of TASVEG mapping units allocated to the EPBCA entity were mapped within areas likely to be disturbed by future quarry expansion activities.

The Commonwealth Department of the Environment provides a *Significant Impact Guidelines* policy statement (CofA 2013) to determine if referral to the department is required. In my opinion, with respect to the above species and communities, any proposed disturbance within the lease area will not constitute a "significant impact" because the disturbance is not such that it is likely to lead to a long-term decrease in the size of an important population of a species (or listed ecological community), reduce the area of occupancy of an important population (or area of listed ecological community), fragment an existing important population into two or more populations, adversely affect habitat critical to the survival of a species, disrupt the breeding cycle of an important population, modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, result in invasive species that are harmful to a threatened species becoming established in the threatened species' habitat, introduce disease that may cause the species to decline, or interfere substantially with the recovery of the species.

No formal referral to the Commonwealth Department of the Environment under the *Significant Impact Guidelines* (CofA 2013) is warranted.

Tasmanian Nature Conservation Act 2002

Schedule 3A of the Act lists vegetation types classified as threatened within Tasmania. The lease area includes one such vegetation type. The intent of the listing on the Act is to prevent clearing of these vegetation types. The administrative control on such clearing is through the Tasmanian forest practices system or under the local planning scheme. Further details are provided under the *Forest Practices Act 1985* (see below). Note that no areas of threatened native vegetation will be affected by the proposal.

Tasmanian Wildlife (General) Regulations 2010

While the assessment of the subject title indicated the presence of species listed on schedules of the Regulations (i.e. "specially protected wildlife", "protected wildlife", "partly protected wildlife"), no "products" (e.g. nests, dens, etc.) of these species were detected from within areas likely to be disturbed. At this stage of planning, any disturbance within the lease area will not knowingly disturb listed species or products of such species, such that no special actions are likely to be required in relation to these *Regulations*.

Tasmanian Weed Management Act 1999

Three species classified as "declared weeds" within the meaning of the *Tasmanian Weed Management Act 1999* was detected from within the lease area.

This species are subject to a Statutory Weed Management Plans under the *Weed Management Act 1999* (see information on weed section of DPIPWE's web site). The study area falls within the Northern Midlands municipality, which for the management of the species is classified as a "Zone B" municipality (widespread infestations).

In relation to "Zone B" species, "containment", within the meaning of the *Weed Management Act 1999*, is the most appropriate management objective for municipalities who have problematic infestations but no plan and/or resources to undertake control actions at a level required for eradication. The management outcome for these municipalities is ongoing prevention of the spread of declared weeds from existing infestations to areas free or in the process of becoming free of these weeds.

The current weed distribution does not present a significant risk to natural ecological values such as populations of threatened flora or the condition of native vegetation. The expansion of quarrying is unlikely to exacerbate the current weed status of the site. Stripping of topsoil will probably concentrate weed propagules and the opportunity for weeds to colonise disturbed ground, and these sites should be the focus of any weed control activities. Incorporating weed management into any management plan for the site is considered prudent.

Tasmanian Forest Practices Act 1985 and associated regulations

The Act provides this definition of the concept of "clearing":

**clearing of trees** means the removal of trees by-

- (a) clearing, cutting, pushing or otherwise removing; or
- (b) destroying the trees in any way.

The Act provides this definition of the concept of "trees":

**trees** means -

- (a) any woody plants with a height or potential height of 5 metres or more, whether or not living, dead, standing or fallen, that are-
  - (i) native to Tasmania; or
  - (ii) introduced into Tasmania and used for the processing or harvesting of timber; and
- (b) tree ferns [where **tree fern** means a plant of the species *Dicksonia antarctica*].

Within the lease area, on this basis, even the removal of seedlings, saplings, logs or trunks (dead or alive) of species of *Eucalyptus*, *Acacia* and *Bursaria* may constitute "clearing" of "trees" under the Act.

The *Forest Practices Regulations 2007* specify circumstances in which an FPP is not required, as follows:

4. Circumstances in which forest practices plan, &c., not required

For the purpose of section 17(6) of the Act, the following circumstances are prescribed:

- (i) the harvesting of timber or the clearing of trees on any land, or the clearance and conversion of a threatened native vegetation community on any land, in the course of mineral exploration activities, or mining activities, that are authorised under -
  - (ii) an exploration licence within the meaning of the *Mineral Resources Development Act 1995*; or
  - (iii) a retention licence within the meaning of the *Mineral Resources Development Act 1995*; or
  - (iv) a mining lease within the meaning of the *Mineral Resources Development Act 1995*.

On the basis of the above information, the proposed extraction activities will not require a Forest Practices Plan.

### **Recommendations**

The recommendations provided below are a summary of those provided in relation to each of the ecological features described in the main report. The main text of the report, and supported appendices, provide the relevant context for the recommendations.

#### *Vegetation types*

It is recommended that the proposed extension to the quarry exclude areas mapped as native forest/woodland and that the rocky ridgeline be used to define the limit of works (this means that higher priority native vegetation types are effectively wholly excluded).

#### *Threatened flora*

A permit under the Tasmanian *Threatened Species Protection Act 1995* will be required for disturbance to some species through application to the Policy Conservation & Advice Branch (PCAB, DPIPWE).

Protection of populations of threatened flora that occur on the edge of the existing quarry and proposed extension area is recommended (e.g. fencing of some sort), and that periodic monitoring take place.



*Threatened fauna*

There is limited potential habitat present for several State- and Commonwealth-listed fauna species but no known sites or specific habitat features (e.g. den, nests) requiring special management.

*Weeds and disease*

It is recommended that every effort is made to minimise the risk of introducing weeds and/or disease to the site through application of strict machinery hygiene protocols – see guidelines in *Keeping It Clean: A Tasmanian Field Hygiene Manual to Prevent the Spread of Freshwater Pests and Pathogens* (Allan & Gartenstein 2010).

*Legislation and policy*

No formal referral to the relevant Commonwealth government agency under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* is considered warranted.

A permit under the Tasmanian *Threatened Species Protection Act 1995* will be required for disturbance to some species through application to the Policy Conservation & Advice Branch (PCAB, DPIPWE).

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## APPENDIX A. Analysis of database records of threatened flora

Table A1 provides a listing of priority flora from within 500 m and 5000 m of the lease area (nominal buffer widths usually used to discuss the potential of a particular study area to support various species listed in databases), with comments on whether potential habitat is present for the species, and possible reasons why a species was not recorded. Some species not listed on databases but considered by the author to have potential to occur in the lease area are also discussed.

Note that the field assessment was not restricted to the species listed in Table A1 but considered any threatened flora with the potential to be present. While the database analysis utilises a nominal buffer of 5000 m, the author's own experience of the vegetation and flora of the Midlands combined with database interrogation, meant that the specific potential for numerous other species previously recorded from the wider area were taken into account.

**Table A1.** Priority flora records from within 500 m and 5000 m of boundary of lease area

Species listed below are listed as rare (r), vulnerable (v), endangered (e), or extinct (x) on the Tasmanian *Threatened Species Protection Act 1995* (TSPA); vulnerable (VU), endangered (EN), critically endangered (CR) or extinct (EX) on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA). Information below is sourced from the DPIPWE's *Natural Values Atlas* (DPIPWE 2015a) and other sources where indicated. Habitat descriptions are taken from TSS (2003+) and TSS (2012), except where otherwise indicated.

| Species   | Status<br>TSPA<br>EPBCA | Observations   | Comments  |
|---|-------------------------|--|---|
| <b>Records within the lease area</b>  |                         |  |   |
| <i>Colobanthus curtisiae</i><br>(grassland cupflower)                       | r<br>VU                 | A. Pyrke, 1 Jan. 1990, 532112mE<br>5336483mN<br>± 50 m   | Potential habitat (native grasslands, especially associated with bare soil in lowland areas, and rocky outcrops in higher elevation sites) present. The site is in the southeast of the lease area but well away from the proposed quarry extension area.<br><br>Several targeted surveys did not detect this species but it remains possible that it is present, most likely associated with the rocky ridgeline and grassy slopes outside the likely quarry extension area. |
| <i>Hyalosperma demissum</i><br>(moss sunray)                                | e<br>-                  | L. Gilfedder, 1 Jan. 1995, 531912mE<br>5336683mN<br>± 100 m & (same location, precision)<br>D. Ziegeler, 19 Oct. 1995<br><br>[3 additional records within 5,000 m] | Potential habitat (native grasslands and grassy woodlands, often associated with rock plates and patches of bare soil) present. This species was not detected despite several surveys.  |
| <i>Isoetopsis graminifolia</i><br>(grass cushion)                           | v<br>-                  | As above<br>[14 additional records within 5,000 m]   | As above.   |
| <i>Leucochrysum albicans</i> var. <i>tricolor</i><br>(grassland paperdaisy) | e<br>EN                 | J.B. Kirkpatrick/<br>L. Gilfedder, 1 Jan. 1994, 532012mE<br>5336583mN<br>± 100 m<br><br>[1 additional record within 500 m;   | The record is nominally placed in the southeast of the lease area but well outside any areas that would be affected by the likely quarry extension. The record is of low precision and it is doubtful if it was actually collected from within the private property (a roadside collection is more likely).   |

| Species  | Status<br>TSPA<br>EPBCA | Observations  | Comments  |
|--|-------------------------|---|---|
|  |                         | numerous records within 5,000 m]  | Despite surveys at the peak flowering period, this species was not detected.  |
| <i>Stackhousia subterranea</i><br>(grassland candles)                                | e<br>-                  | A.M. Buchanan,<br>23 Oct. 1985,<br>531812mE<br>5336583mN<br>± 100 m ("hill on N<br>side of Tunbridge<br>Tier Road, 4.3km<br>from Midlands<br>Highway")<br><br>A.M. Buchanan,<br>25 Nov. 1985 &<br>22 Dec. 1985,<br>532212mE<br>5336483mN<br>± 100 m<br>("Tunbridge Tiers<br>Road, 3km W of<br>the Midlands<br>Highway")<br><br>[12 additional<br>records within<br>500 m and<br>numerous<br>additional records<br>within 5,000 m] | Species detected – see <b>RESULTS Plant species</b><br><u>Priority flora species detected from the lease area.</u>  |
| <b>Records within 500 m of the lease area</b> [and not considered in above sections] |                         |   |   |
| <i>Austrostipa nodosa</i><br>(knotty speargrass)                                     | r<br>-                  | 1 record<br>[numerous<br>additional records<br>within 5,000 m]  | Species detected – see <b>RESULTS Plant species</b><br><u>Priority flora species detected from the lease area.</u>  |
| <i>Austrostipa scabra</i><br>(sickle speargrass)                                     | r<br>-                  | 1 record within<br>500 m (subspecies<br>not reported)<br>[numerous<br>additional records<br>within 5,000 m]   | Species detected – see <b>RESULTS Plant species</b><br><u>Priority flora species detected from the lease area.</u>  |
| <i>Carex tasmanica</i><br>(curly sedge)  | -<br>VU                 | 1 record<br>[numerous<br>additional records<br>within 5,000 m]  | Potential habitat (usually lowland grasslands and<br>grassy woodlands, often in poorly-drained<br>depressions) is effectively absent (mainly too well-<br>drained and insulated). The species was not detected<br>from either of the drainage lines on the eastern and<br>western parts of the lease area (both will be unaffected<br>by the quarry expansion). |
| <i>Cryptandra amara</i><br>(pretty pearlflower)                                      | e<br>-                  | 1 record<br>[numerous<br>additional records<br>within 5,000 m]  | Species detected – see <b>RESULTS Plant species</b><br><u>Priority flora species detected from the lease area.</u>  |
| <i>Velleia paradoxa</i><br>(spur velleia)  | v<br>-                  | 6 records<br>[5 additional<br>records within<br>5,000 m]  | Potential habitat (grassy woodlands) present. This<br>annually flowering herb (which was detectable at other<br>sites along Tunbridge Tier Road at the time of the site<br>surveys) was not detected.   |
| <i>Vittadinia burbridgeae</i><br>(smooth new-holland-daisy)                          | r<br>-                  | 3 records   | Species detected – see <b>RESULTS Plant species</b><br><u>Priority flora species detected from the lease area.</u>  |

| <i>Species</i>  | <i>Status</i><br>TSPA<br>EPBCA | <i>Observations</i>                          | <i>Comments</i>  |
|---|--------------------------------|--|--|
|   |                                | [numerous additional records within 5,000 m] |  |
| <b>Records within 5000 m of the lease area</b> [and not considered in above sections] |                                |  |  |
| <i>Amphibromus macrorhinus</i><br>(longnose swampgrass)                               | e<br>-                         | 1 record                                     | Potential habitat (sedy swamps and wetlands) absent (the species was not detected from the drainage depressions or the dam).   |
| <i>Aphelia pumilio</i><br>(dwarf fanwort)   | r<br>-                         | 1 record                                     | Potential habitat (native grasslands and grassy woodlands) present. This annually flowering herb was not detected (detectable at other sites in the Midlands at the time of the survey).   |
| <i>Arthropodium strictum</i><br>(chocolate lily)                                      | r<br>-                         | 3 records                                    | Species detected – see <b>RESULTS Plant species Priority flora species detected from the lease area.</b>   |
| <i>Asperula scoparia</i> subsp. <i>scoparia</i><br>(prickly woodruff)                 | r<br>-                         | 1 record                                     | Potential habitat (open grassland, grassy forest and woodland and pasture) present. The species was not detected.  |
| <i>Baumea gunnii</i><br>(slender twigsedge)   | r<br>-                         | 1 record                                     | Potential habitat (sedy swamps and wetlands, rocky riparian areas) absent (the species was not detected from the drainage depressions or the dam).   |
| <i>Bolboschoenus caldwellii</i><br>(sea clubsedge)                                    | r<br>-                         | 4 records                                    | Potential habitat (semi-saline coastal and inland lagoons) absent (the species was not detected from the drainage depressions or the dam).   |
| <i>Bolboschoenus medianus</i><br>(marsh clubsedge)                                    | r<br>-                         | 9 records                                    | As above.  |
| <i>Brachyscome rigidula</i><br>(cutleaf daisy)  | v<br>-                         | numerous records                             | Potential habitat (native grasslands and grassy shrubland, usually on fertile soils) present. This species was not detected (detectable at the time of survey at Township Lagoon and on Midland Highway verge near Tunbridge Tier Road junction).  |
| <i>Caladenia anthracina</i><br>(blacktip spider-orchid)                               | e<br>CR                        | 1 record                                     | The record is of low precision but potential habitat (native grasslands and grassy woodlands with a <i>Themeda triandra</i> understorey) is present. The species was confirmed from Campbell Town Golf Course (a key population) and surveys of the lease area timed to coincide with this flowering event. The species was not detected. The woodland areas may be too heavily grazed for the species and the open grassy areas are perhaps too rocky and/or dominated by exotic grass species. In my opinion, it is highly unlikely the species is present within the lease area, and is even less likely to occur in any areas proposed for quarry expansion. |
| <i>Calocephalus lacteus</i><br>(milky beautyheads)                                    | r<br>-                         | several records                              | Potential habitat (usually near-saline poorly-drained verges of native grassland and edges of inland lagoons and large swamps) marginally present (e.g. edges of Blackman River tributary). This species was not detected (detectable at any time of the year from vegetative features).   |
| <i>Carex gunniana</i><br>(mountain sedge)   | r<br>-                         | 1 record                                     | Potential habitat (poorly understood but includes poorly-drained grassland drainages and edges of grass/sedge-dominated swales) is probably absent. This perennial sedge was not detected.   |

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| <b>Species</b>   | <b>Status</b><br>TSPA<br>EPBCA | <b>Observations</b>                              | <b>Comments</b>  |
|--|--------------------------------|--|--|
| <i>Dianella amoena</i><br>(grassland flaxlily)                               | r<br>EN                        | numerous records                                 | Potential habitat (native grasslands and grassy woodlands on fertile substrates) present. This species was not detected, which is quite surprising given its prevalence in grassy/rocky vegetation along Tunbridge Tier Road.  |
| <i>Glycine latrobeana</i><br>(clover glycine)                                | v<br>VU                        | 1 record   | Potential habitat (native grasslands, grassy woodlands and occasionally extending into grassy forest) present. The surveys coincided with a flush of flowering at a relatively nearby site (Nile Road) but was not detected. The grassy slopes are perhaps too densely grassy and heavily grazed and the species is not usually associated with such expansive areas of open rock.   |
| <i>Hypoxis vaginata</i><br>(sheathing yellowstar)                            | r<br>-                         | 1 record<br>(subspecies not reported)            | Potential habitat (open grassland, grassy forest and woodland and pasture) widespread. The species was not detected despite several surveys during the peak flowering period (flowering at numerous other sites in the Midlands and Tamar regions at the time of surveys).   |
| <i>Lachnagrostis punicea</i><br>subsp. <i>punicea</i><br>(bristle blowgrass) | r<br>-                         | 2 duplicate records                              | Potential habitat (native grasslands and grassy woodlands) present (species usually occurs in better condition and more diverse native grassland). This mainly spring-flowering grass (although often detectable from the dislodged tumbling flowerheads at other times of the year) was not detected.   |
| <i>Lachnagrostis robusta</i><br>(tall blowgrass)                             | r<br>-                         | 1 record   | Potential habitat (coastal and inland saline lagoon margins) absent (known from edge of Township Lagoon: the species was not detected from the drainage depressions or the dam).   |
| <i>Lepidium hyssopifolium</i><br>(soft peppergrass)                          | e<br>EN                        | 7 records  | Potential habitat is variable, but often includes underneath ornamental trees (especially conifers), which are absent from the study area. The species was not recorded.   |
| <i>Lepidium pseudotasmanicum</i><br>(shade peppergrass)                      | r<br>-                         | 2 records  | As above but habitat more variable. This species was not detected.   |
| <i>Lepilaena patentifolia</i><br>(spreading watermat)                        | r<br>-                         | 2 duplicate records                              | Potential habitat (aquatic habitats, usually saline) absent (known from Township Lagoon).  |
| <i>Prasophyllum tunbridgense</i><br>(tunbridge leek-orchid)                  | e<br>EN                        | several records representing one main population | Potential habitat (native grasslands, as at Township Lagoon Nature Reserve) present. The surveys were timed to maximise the opportunity to detect this species, which flowers in October and November (Wapstra et al. 2012), variable depending on seasonal conditions. Flowering this season was confirmed at Township Lagoon. Note that stock were removed also to maximise the opportunity for spring flowering to occur. This species was not detected.  |
| <i>Pterostylis commutata</i><br>(midlands greenhood)                         | e<br>CR                        | 6 records  | Potential habitat (native grasslands, usually on broad valley floors and adjacent slopes, often on fertile substrates) is present. Surveys to date have not been undertaken during the peak flowering period of summer (Wapstra et al. 2012) but have allowed an assessment of the potential of the lease area to support the species. I do not believe that the heavily grazed rockier areas proposed for quarry expansion are highly suitable for the species but some surrounding grassier slopes are superficially suitable. |

| <b>Species</b>  | <b>Status</b><br>TSPA<br>EPBCA | <b>Observations</b>                                     | <b>Comments</b>   |
|---|--------------------------------|---|---|
|   |                                |   | That said, the grazing regime and dense grass layer may have rendered the habitat unsuitable: this, combined with the highly disjunct distribution of the species, means that the likelihood of the species being present is very low. I do not believe that further surveys of the proposed quarry extension area is warranted for this species. Informal and ongoing survey of the grassy slope south of the existing quarry is suggested but should not be a formal condition of approval because the more likely habitat will not be affected by the works. |
| <i>Pultenaea prostrata</i><br>(silky bushpea)   | v<br>VU                        | 4 records   | Potential habitat (native grasslands) is present. This distinctive low shrub was not detected.  |
| <i>Ranunculus prasinus</i><br>(midlands buttercup)  | e<br>EN                        | 5 records   | Potential habitat (poorly-drained swales amongst native grassland and grassy woodlands) absent. The species is known from a population on the western side of the Midland Highway just south of Tunbridge Tier Road. This perennial herb was not detected.  |
| <i>Ruppia megacarpa</i><br>(largefruit seatassel)   | r<br>-                         | 5 records   | Potential habitat (aquatic habitats, usually saline) absent (known from Township Lagoon).   |
| <i>Rytidosperma indutum</i><br>(tall wallabygrass)  | r<br>-                         | 1 record  | Potential habitat (usually grassy forests and woodlands) is present. This distinctive perennial grass was not detected.   |
| <i>Scleranthus diander</i><br>(tufted knawel)   | v<br>-                         | numerous records  | Species detected – see <b>RESULTS Plant species</b> Priority flora species detected from the lease area.  |
| <i>Scleranthus fasciculatus</i><br>(spreading knawel)   | v<br>-                         | 9 records   | Potential habitat (native grasslands and grassy forest/woodland) present on. This species was not detected (detectable at any time of the year).  |
| <i>Vittadinia cuneata</i> var.<br><i>cuneata</i><br>(fuzzy new-holland-daisy)                           | r<br>-                         | numerous records  | Species detected – see <b>RESULTS Plant species</b> Priority flora species detected from the lease area.  |
| <i>Vittadinia gracilis</i><br>(woolly new-holland-daisy)  | r<br>-                         | numerous records  | Species detected – see <b>RESULTS Plant species</b> Priority flora species detected from the lease area.  |
| <b>EPBCA-listed species listed as potentially present based on Protected Matters Report (CofA 2015)</b> |                                |   |   |
| <i>Acacia axillaris</i><br>(midlands wattle)  | v<br>VU                        | Species or species' habitat likely to occur within area | Potential habitat (flood-prone rocky riverbeds and banks, adjacent grassy woodlands and slopes) absent. This species was not detected.  |
| <i>Barbarea australis</i><br>(riverbed wintercress)   | e<br>CR                        | Species or species' habitat likely to occur within area | As above.   |
| <i>Caladenia anthracina</i><br>(blacktip spider-orchid)   | e<br>CR                        | Species or species' habitat known to occur within area  | See previous sections of table.   |
| <i>Carex tasmanica</i><br>(curly sedge)   | -<br>VU                        | Species or species' habitat likely to occur within area | See previous sections of table.   |
| <i>Colobanthus curtisiae</i><br>(grassland cupflower)   | r<br>VU                        | Species or species' habitat likely to occur within area | See previous sections of table.   |

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| Species  | Status<br>TSPA<br>EPBCA | Observations  | Comments  |
|--|-------------------------|---|---|
| <i>Dianella amoena</i><br>(grassland flaxlily)   | r<br>EN                 | Species or species' habitat known to occur within area  | See previous sections of table.   |
| <i>Glycine latrobeana</i><br>(clover glycine)  | v<br>VU                 | Species or species' habitat known to occur within area  | See previous sections of table.   |
| <i>Lepidium hyssopifolium</i><br>(soft peppergrass)  | e<br>EN                 | Species or species' habitat known to occur within area  | See previous sections of table.   |
| <i>Leucochrysum albicans</i> var.<br><i>tricolor</i><br>(grassland paperdaisy)                             | e<br>EN                 | Species or species' habitat known to occur within area  | See previous sections of table.   |
| <i>Prasophyllum incorrectum</i><br>(golfers leek-orchid)   | e<br>CR                 | Species or species' habitat likely to occur within area | Potential habitat (native grasslands, usually on broad valley floors and adjacent slopes, often on fertile substrates) is marginally present, although atypical (known sites are on much flatter terrain, with less rock cover). The surveys coincided with the peak flowering at the key site of Campbell Town Golf Course and the species was not detected. |
| <i>Prasophyllum tunbridgense</i><br>(tunbridge leek-orchid)  | e<br>EN                 | Species or species' habitat likely to occur within area | See previous sections of table.   |
| <i>Pterostylis commutata</i><br>(midlands greenhood)   | e<br>CR                 | Species or species' habitat known to occur within area  | See previous sections of table.   |
| <i>Pterostylis wapstrarum</i><br>(fleshy greenhood)  | e<br>CR                 | Species or species' habitat known to occur within area  | Potential habitat (native grasslands, usually on broad valley floors and adjacent slopes, often on fertile substrates) is marginally present, although the heavily grazed sites are highly unsuitable and the grassy slopes probably too dense to support the species. Surveys coincided with the October/November flowering period (Wapstra et al. 2013).    |
| <i>Pterostylis ziegeleri</i><br>(grassland greenhood)  | v<br>VU                 | Species or species' habitat may occur within area       | As above.   |
| <i>Ranunculus prasinus</i><br>(midlands buttercup)   | e<br>EN                 | Species or species' habitat likely to occur within area | See previous sections of table.   |
| <i>Rytidosperma popinensis</i><br>(blue wallabygrass)  | r<br>EN                 | Species or species' habitat may occur within area       | Since the production of the <i>Protected Matters Search Tool</i> report, this species has been removed from schedules of the EPBCA because it has been shown to be synonymous with <i>R. fulvum</i> and likely to be introduced to Tasmania (Lorimer 2014). For the record, <i>R. fulvum</i> was not detected.  |
| <b>Additional species considered by the author with potential to be present but not shown in databases</b> |                         |   |   |
| <i>Austrostipa bigeniculata</i><br>(doublejointed wallabygrass)  | r<br>-                  | no database records                                     | Potential habitat (native grasslands and grassy woodlands) present. This species was not detected.  |
| <i>Cynoglossum australe</i><br>(coast houndstongue)  | r<br>-                  | no database records                                     | Potential habitat (stabilised dunes in near-coastal sites, inland sites on dolerite slopes, also in grassland and grassy woodland on broad valley floors) marginally present (can occur as a "weed" on road verges). The species was not detected (perennial herb).   |



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| <i>Species</i>   | <i>Status</i><br>TSPA<br>EPBCA | <i>Observations</i>                         | <i>Comments</i>   |
|--|--------------------------------|---|---|
| <i>Desmodium varians</i><br>(slender ticktrefoil)      | e<br>-                         | no database records                         | Potential habitat (rockplate grassland and <i>Themeda triandra</i> grassland) present but species only known from Pontville and Fingal Valley. This species was not detected.   |
| <i>Pimelea</i> sp. Tunbridge<br>(grassland riceflower) | pending<br>(e)<br>-            | known populations along Tunbridge Tier Road | Species detected – see <b>RESULTS Plant species</b> Priority flora species detected from the lease area.  |
| <i>Scleranthus brockiei</i><br>(mountain knawel)       | r<br>-                         | no database records                         | Potential habitat (usually mid to higher elevations in open habitats such as native grasslands, tracks through forest and poorly-drained sites, but also occasionally in similar habitats in lowland areas) marginally present (was reported from the dam on the Blackman River for the township supply). The species was not detected. |
| <i>Siloxerus multiflorus</i><br>(small wrinklewort)    | r<br>-                         | no database records                         | See comments under <i>Hyalosperma demissum</i> and <i>Isoetopsis graminifolia</i> (similar habitat and flowering regime).   |
| <i>Triptilodiscus pygmaeus</i><br>(dwarf sunray)       | v<br>-                         | no database records                         | As above.   |

## APPENDIX B. Analysis of database records of threatened fauna

Table B1 provides a listing of priority fauna from within the lease area, and from 500 m and 5000 m of the lease area (nominal buffer widths usually used to discuss the potential of a particular study area to support various species listed in databases), with comments on whether potential habitat is present for the species, and possible reasons why a species was not recorded.

**Table B1.** Priority fauna records from within the study area, and from 500 m and 5000 m of boundary of lease area

Species listed below are listed as rare (r), vulnerable (v), endangered (e), or extinct (x) on the Tasmanian *Threatened Species Protection Act 1995* (TSPA); vulnerable (VU), endangered (EN), critically endangered (CR) or extinct (EX) on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA). Information below is sourced from the DPIPWE's *Natural Values Atlas* (DPIPWE 2015a), Bryant & Jackson (1999) and FPA (2015); marine, wholly pelagic and littoral species such as marine mammals, fish and offshore seabirds are excluded

| Species   | Status<br>TSPA<br>EPBCA | Observations   | Comments  |
|---|-------------------------|--|---|
| <b>Records from within the lease area</b>                                     |                         |  |   |
| No records known from within the lease area                                   |                         |  |   |
| <b>Records within 500 m of the lease area</b>                                 |                         |  |   |
| No records known from within 500 m of the lease area                          |                         |  |   |
| <b>Records and potential habitat within 5000 m of study area</b>              |                         |  |   |
| <i>Accipiter novaehollandiae</i><br>(grey goshawk)                            | e<br>-                  | no database records  | Potential habitat is described as "native forest with mature elements below 600 m altitude, particularly along watercourses" (FPA 2015), habitat elements absent from study area (species occurs in wet forests).<br>There are no known nests within 500 m of the lease area and no novel nests were detected during the course of the present assessment. No individuals were sighted during assessment.   |
| <i>Catadromus lacordairei</i><br>(green-lined ground beetle)                  | v<br>-                  | no database records  | Potential habitat is "open, grassy/sedgy, low altitude grasslands and woodlands associated with wetlands and low-lying plains or flats adjacent to rivers/streams" and key habitat elements that need to be present include "sheltering sites such as patches of stones, coarse woody debris and/or cracked soils" (FPA 2015), habitat elements absent from the lease area.   |
| <i>Aquila audax</i> subsp.<br><i>fleayi</i><br>(Tasmanian wedge-tailed eagle) | e<br>EN                 | no known nests within 1000 m of the boundary of the study area | Potential breeding habitat is defined as "tall eucalypt trees in large tracts (usually more than 10 ha) of eucalypt or mixed forest" and potential foraging habitat "includes a wide variety of forested (including areas subject to native forest silviculture) and non-forest habitats" (FPA 2015).<br>The species is likely to utilise the broader study area as part of a broader territory and a foraging area. There are no known nests within 500 m (or 1000 m line-of-sight), usual nominal management buffers applied in production forests. The present survey did not detect any novel nest sites from the study area. |

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| <b>Species</b>   | <b>Status</b><br>TSPA<br>EPBCA | <b>Observations</b>  | <b>Comments</b>   |
|--|--------------------------------|--|---|
| <i>Chrysolarentia decisaria</i><br>(tunbridge looper moth)                     | e<br>-                         | 1 record   | Species is known only from the margins of Township Lagoon east of Tunbridge. It is reasonable to assume that the progressive clearing of highly disturbed rocky grassland will not impact on this species at this site.   |
| <i>Dasyurus maculatus</i><br>subsp. <i>maculatus</i><br>(spotted-tailed quoll) | r<br>VU                        | 3 records  | Potential habitat is described as "coastal scrub, riparian areas, rainforest, wet forest, damp forest, dry forest and blackwood swamp forest (mature and regrowth), particularly where structurally complex and steep rocky areas are present, and includes remnant patches in cleared agricultural land" (FPA 2015), habitat types technically absent from the study area.<br><br>The present survey did not detect any direct evidence of the species (e.g. live sightings, roadkill, scats, dens) and it is unlikely that the proposed works will impact deleteriously on the potential habitat of this species. |
| <i>Galaxias fontanus</i><br>(swan galaxias)                                    | e<br>EN                        | no database records  | The study area is outside the realistic range of the species (there are records from the Macquarie River system, which is the cause of the listing) and potential habitat (slow-flowing forested streams) is absent.  |
| <i>Haliaeetus leucogaster</i><br>(white-bellied sea-eagle)                     | v<br>-                         | no known nests within 1000 m of the boundary of study area | See comments under wedge-tailed eagle.  |
| <i>Haloniscus searlei</i><br>(salt lake slater)                                | e<br>-                         | 4 records  | Species is known only from the margins of Township Lagoon east of Tunbridge within the saline lagoon.   |
| <i>Litoria raniformis</i><br>(green and golden frog)                           | v<br>VU                        | no database records  | Potential habitat is "permanent and temporary waterbodies, usually with vegetation in or around them, including features such as natural lagoons, permanently or seasonally inundated swamps and wetlands, farm dams, irrigation channels, artificial water-holding sites such as old quarries, slow-flowing stretches of streams and rivers and drainage features" (FPA 2015), habitat elements essentially absent from the study area (the small dam was surveyed on three occasions in warm still conditions and the species was not detected).  |
| <i>Oreixenica ptunarra</i><br>(ptunarra brown butterfly)                       | v<br>EN                        | 1 record   | Potential habitat is "native grasslands, sedgelands, heathlands, shrublands or grassy woodlands with tussock grass ( <i>Poa</i> ) cover of more than 20%", which is absent from the majority of the lease area. The south-facing slopes support marginal potential habitat but this is highly localised and will not be affected by any quarrying activities.   |
| <i>Perameles gunnii</i> subsp. <i>gunnii</i><br>(eastern barred bandicoot)     | -<br>VU                        | 1 record   | Potential habitat is "open vegetation types including woodlands and open forests with a grassy understorey, native and exotic grasslands, particularly in landscapes with a mosaic of agricultural land and remnant bushland" (FPA 2015), habitat types present within the study area.<br><br>No evidence of the species (e.g. distinctive diggings) was observed (ground very stony and hard, atypical of prime habitat). The proposed gradual expansion of the quarry into disturbed "grassland" is unlikely to deleteriously impact on the species or its habitat.   |
| <i>Pseudemoia pagenstecheri</i><br>(tussock skink)                             | v<br>-                         | 4 records  | Potential habitat is "grassland and grassy woodland (including rough pasture with paddock trees), generally with a greater than 20% cover of native grass species, especially where medium to tall tussocks are present" (FPA 2015), habitat types present in parts of the lease  |

| <i>Species</i>  | <i>Status</i><br>TSPA<br>EPBCA             | <i>Observations</i>                                     | <i>Comments</i>   |
|---|--|---|---|
|   |  |   | area (e.g. grassy slopes to south of the existing quarry area). The area into which the quarry will expand is rocky and open with poor tussock development (possibly due to heavy grazing). Provided this condition remains, the tussock skink is unlikely to utilise the proposed quarry extension area and further surveys or special management prescriptions are not recommended.   |
| <i>Sarcophilus harrisii</i><br>(Tasmanian devil)  | e<br>EN                                    | 11 records  | Potential habitat is described as "all terrestrial native habitats, forestry plantations and pasture" (FPA 2015), habitat types present within the study area.<br>The present survey did not detect any direct evidence of the species (e.g. live sightings, roadkill, scats, dens) but it is reasonable to assume that the species is present throughout the greater area.<br>Any proposed works are unlikely to impact deleteriously on the potential habitat of this species.  |
| <i>Tyto novaehollandiae</i><br>subsp. <i>castanops</i><br>(Tasmanian masked owl)  | e<br>VU                                    | no nest/roost records within 5000 m                     | Potential habitat "is all areas with trees with large hollows (15 cm entrance diameter). In terms of using mapping layers, potential habitat is considered to be all areas with at least 20% mature crown cover" (FPA 2015) but is more conservatively considered to be eucalypt-dominated forest below c. 600 m elevation, habitat elements marginally present within the study area. All remnant dead trees with hollows were carefully assessed and none had evidence of use (e.g. whitewash, pellets, prey, etc.) and most trees with potentially suitable hollows were infested by starlings.<br>The species is likely to utilise the study area for foraging and temporary roosting only; the proposed quarry expansion will not affect this component of the potential habitat of the species. |
| <b>EPBCA-listed species listed as potentially present based on Protected Matters Report (CofA 2015)</b><br>[excluding marine, pelagic and littoral species] |  |   |   |
| <i>Aquila audax</i> subsp. <i>fleayi</i><br>(Tasmanian wedge-tailed eagle)  | e<br>EN                                    | Breeding likely to occur within area                    | See previous sections of table.   |
| <i>Apus pacificus</i><br>(fork-tailed swift)  | Migratory<br>Marine<br>Species             | Species or species' habitat likely to occur within area | Aerial foraging bird that rarely lands – study area presents marginal habitat only and any works in the area would not have a deleterious impact on the species.  |
| <i>Ardea alba</i><br>(great egret)  | Migratory<br>Wetland/<br>Marine<br>Species | Species or species' habitat likely to occur within area | Potential habitat (natural and artificial wetlands and swampy habitats) absent.   |
| <i>Ardea ibis</i><br>(cattle egret)   | Migratory<br>Wetland/<br>Marine<br>Species | Species or species' habitat may occur within area       | As above.   |
| <i>Botaurus poiciloptilus</i><br>(Australasian bittern)   | -<br>EN                                    | Species or species' habitat known to occur within area  | Potential habitat (natural and artificial wetlands and swampy habitats) absent.   |
| <i>Dasyurus maculatus</i><br>subsp. <i>maculatus</i><br>(spotted-tailed quoll)  | r<br>VU                                    | Species or species' habitat known to occur within area  | See previous sections of table.   |

| <b>Species</b>   | <b>Status</b><br>TSPA<br>EPBCA      | <b>Observations</b>  | <b>Comments</b>  |
|--|-------------------------------------|--|--|
| <i>Gallinago hardwickii</i><br>(Latham's Snipe)                                  | Migratory<br>Wetland<br>Species     | Species or<br>species' habitat<br>may occur within<br>area       | Potential habitat (natural and artificial wetlands and<br>swampy habitats) absent.   |
| <i>Lathamus discolor</i><br>(swift parrot)                                       | e<br>EN                             | Species or<br>species' habitat<br>may occur within<br>area       | Site is well outside the mapped range of the species<br>(DPIPWE 2015; FPA 2015).   |
| <i>Haliaeetus leucogaster</i><br>(white-bellied sea-eagle)                       | v<br>-                              | Species or<br>species' habitat<br>likely to occur<br>within area | See previous sections of table.  |
| <i>Hirundapus caudacutus</i><br>(white-throated<br>needle-tail)                  | Migratory<br>Terrestrial<br>Species | Species or<br>species' habitat<br>may occur within<br>area       | Aerial foraging bird that rarely lands – study area<br>presents marginal habitat only and any works in the area<br>would not have a deleterious impact on the species.   |
| <i>Litoria raniformis</i><br>(green and golden frog)                             | v<br>VU                             | Species or<br>species' habitat<br>may occur within<br>area       | See previous sections of table.  |
| <i>Perameles gunnii</i> subsp.<br><i>gunnii</i><br>(eastern barred<br>bandicoot) | -<br>VU                             | Species or<br>species' habitat<br>likely to occur<br>within area | See previous sections of table.  |
| <i>Myiagra cyanoleuca</i><br>(satin flycatcher)                                  | Migratory<br>Terrestrial<br>Species | Species or<br>species' habitat<br>known to occur<br>within area  | Potential habitat marginally present (species utilises a<br>wide range of habitats but tends to be most frequent in<br>dry open tall woodlands and forests and associated<br>sheltered slopes/gullies).<br>The species was not detected by sight or call during the<br>assessment, which was partially undertaken within the<br>species' residential period in the State. Any works in the<br>area would not have a deleterious impact on the species<br>because such works will be restricted to very open<br>"grassland" habitats. |
| <i>Oreixenica ptunarra</i><br>(ptunarra brown<br>butterfly)                      | v<br>EN                             | Species or<br>species' habitat<br>may occur within<br>area       | See previous sections of table.  |
| <i>Sarcophilus harrisii</i><br>(Tasmanian devil)                                 | e<br>EN                             | Species or<br>species' habitat<br>likely to occur<br>within area | See previous sections of table.  |
| <i>Tyto novaehollandiae</i><br>subsp. <i>castanops</i><br>(Tasmanian masked owl) | e<br>VU                             | Species or<br>species' habitat<br>known to occur<br>within area  | See previous sections of table.  |

**APPENDIX C. DPIPWE's *Natural Values Atlas* report for study area**

Appended as pdf file.

**APPENDIX D. Forest Practices Authority's *Biodiversity Values Atlas* report for study area**

Appended as pdf file.

**APPENDIX E. CofA's *Protected Matters* report for study area**

Appended as pdf file.

**OTHER ATTACHMENTS**

- .shp and/or .dwg file of point locations of threatened flora
- .xls file of point locations of threatened flora
- .shp and/or .dwg file of vegetation mapping

# BLAST MANAGEMENT PLAN

FOR

HBMI

TUNBRIDGE QUARRY



## Contents

Operations/Blasting/Customers/Documents/HBMI/Blast Management Plan |

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## 1. Introduction

Forze Explosive Services (FES) has been contracted by HBMI to undertake blasting operations to fracture rock at the Tunbridge Quarry site.

## 2. Blast Locations

### **Tunbridge Quarry:**

The Tunbridge Quarry is located 6km west of the Township of Tunbridge.

## 3. Blast Times

The blasts nominated in this Blast Management Plan (BMP) will be scheduled for between the hours of 10.00am and 4.00pm Monday to Friday only.

No Blasting is permitted on Weekends nor nominated Public Holidays. Any blasting that may need to be undertaken outside these scheduled hours can only be done with the prior approval of the relevant authority.

## 4. Blast Design

### **Tunbridge Quarry:**

- a) *Pattern Parameters* – The pattern for the Production blasting area within the Tunbridge Quarry is nominated to be a Staggered Pattern of 2.1m x 2.2m. The average hole depth will be approximately 10.0m.
- b) *Drill Hole Size* – The nominated hole size is 89mm.
- c) *Stemming Height* – A minimum stemming height of 1.8m is to be used at the Tunbridge Quarry. Stemming size is to range from 8mm to 14mm.
- d) *Bulk Explosive* – FES FX Bulk Watergel and FES ANFO will be utilized for all blasting works on the Tunbridge Quarry site.
- e) *Initiation Selection* – All Initiation will be Non-Electric Leads. Shot initiation will be done by means of electric detonator. FES Technical Services personnel shall select the products prior to blasting; this ensures the accurate selection of accessories to maximise the blast performance.

## 5. Potential Impacts

### *Tunbridge Quarry:*

- a) *Air Overpressure* – To minimise the air overpressure from blasting operations it is necessary to ensure the explosive charge is well confined within the rock mass. Each drill hole will be filled with stemming material, from the explosives in the drill hole to the ground surface at a minimum depth of 1.8m, excluding secondary blasting. This will contain the blast energy. In addition, Software generated blast design will ensure that there is adequate burden on the front row of drill holes to prevent blow out. Air overpressure is forecast at <115dBL.
- b) *Vibration* – Minimising ground vibration is achieved by reducing the maximum instantaneous charge (MIC) detonated at any moment and an appropriate blast design that ensures forward movement of the rock material.
- c) *Fly rock* – The typical blast design of the Tunbridge Quarry results in a range of 90 ~200 drill holes.

Flyrock is not considered a potential risk at the Tunbridge Quarry due to:

- o Technical Services Design
  - o Stemming height,
  - o Distance to the nearest residence/business,
  - o Removal of equipment to a minimum of 300m outside the blast zone
  - o Exclusion of all persons within 500m of blast zone
  - o Exclusions zone to be amended when required by the nominated FES Shot firer
- d) *Traffic Management* – Blast Guards will be stationed as directed by the Blast Controller. The Blast Guards will close all traffic access as per FES Blast Guarding Procedure. All HBMI personnel utilized as Blast Guards must be trained in the FES Blast Guarding Procedure. A Risk Assessment prior to blasting will be undertaken to assess if the Interlaken Road, South of the Tunbridge Quarry, necessitates closure during the blasting process.
  - e) *Machinery and Equipment* – All machinery and equipment will be relocated outside the blast zone. The nominated FES Shot Firer will inform the HBMI representative prior to blasting where machinery and equipment is to be stationed.

## 6. Blast Controller

FES nominated Shot Firer will be the appointed Blast Controller for all blasting activities within the Tunbridge Quarry. FES will maintain responsibility for all activities inside the nominated blast exclusion zone. HBMI will nominate a representative prior to the day of blasting; this person will maintain responsibility for all personnel, vehicles, earth moving equipment outside the blast exclusion zone.

## 7. Blast Notification

FES will notify the relevant authorities / agencies;

- a) Tasmania Police Radio Room
- b) Northern Midlands Council

Blast notifications will be completed by FES on the day of the planned blasting operation.

HBMI will be responsible for notification to the local residents/businesses.

FES will notify HBMI Management of planned blasting activities as per HBMI QUA – 07-02/Blasting Process.

## 8. Purpose of Blast Management Plan (BMP)

The Blast Management Plan (BMP) has been prepared to detail how blasting activities will be managed and to identify risks, hazards and procedures to ensure a safe outcome while meeting the customer's requirements.

Continual review of this BMP will ensure improvements and benefits to the overall blasting practice.

The BMP takes into account measures designed to meet permitted ground vibration and overpressure limits of:

- a) Air blast over pressure must not exceed 120 dbl (Lin Peak)
- b) Ground vibration is not a concern for the Tunbridge Quarry due to the proximity of the nearest dwelling but it will be monitored to ascertain and record vibration levels

## 9. Preparation of Blast Management Plan

The BMP has been prepared by the FES Management Team. Additional input has been provided by the FES Operations Manager, Patrick McLoughlin and the FES Shot firing team. This plan has been prepared with adherence to the state regulators legislative requirements and regulation requirements.

## 10. Insurance Cover

FES maintains the mandatory insurance cover. The 3 principal insurance covers include:

- a) Public Liability  
Insurer - Lloyd's Australia  
Policy No. 08070084  
Cover Period - 31/8/15 to 31/8/16, Sum insured \$20,000,000,  
Products Liability, Sum insured \$20,000,000
- b) Workers Compensation  
Insurer - Allianz Australia Insurance Ltd  
Policy No. LWL0019466  
Cover Period - 31/8/15 to 31/8/16, Sum insured as per legislation requirements.
- c) Motor Vehicle  
Insurer - Vero Insurance  
Policy No. MSS012158354  
Cover Period - 31/8/15 to 31/8/16, Sum insured as per schedule.
- d) Iveco Watergel Truck  
Insurer - National Transport Insurance Ltd  
Policy No. 41576077  
Cover Period - 31/8/15 to 31/8/16

All insurances held by FES meet state and federal legislative requirements.

## 11. Blasting Procedure

FES will conduct blasting operations for HBMI structured under the FES Quality System Procedure Base. The FES Quality System Procedure Base is under constant review and development to ensure the adherence to Federal, State and local council regulations.

Procedures include;

- a) Blast Initiation Procedure
- b) Misfire Procedure
- c) Electrical Storm Procedure
- d) Blast Tie Up Procedure
- e) Blast Guarding Procedure

## 12. Types of Explosives

The following bulk explosives may be used during blasting:

- a) Forze FX Bulk
- b) Forze Anfo
- c) Nitro Sibir Cast Boostersw

## 13. Initiation Systems

It is proposed that all down-hole detonator leads and surface connector leads will be a pre chosen non-electric detonation. Blast initiation will be by means of electric surface detonator. The detonators will include;

- a) 500ms downhole delay
- b) 9ms Surface Delay
- c) 17ms Surface Delay
- d) 25ms Surface Delay
- e) 42ms Surface Delay

- f) 65ms Surface Delay

#### 14. Risk Assessment

A Risk Assessment has been undertaken at HBMI and following revision of the assessment a FES Safe Work Method Statement (SWMS) has been developed to allow for best practice whilst onsite.

The FES S.W.M.S document covers;

- a) At depot compliance
- b) Travel to and from HBMI Site
- c) Pre Blast checks
- d) On site work activities
- e) Post Blast checks
- f) Explosive Security

#### 15. Personnel Accreditation

All FES personnel undertaking work on the HBMI site are appropriately trained and licenced to meet all Federal, State and local council regulations and legislative requirements.

Nominated Shot Firers Permit Nos.;

- a) Daniel Crane – 91146

#### 16. Document Approval

This Blast Management Plan (BMP) has been developed and approved by;

Pat McLoughlin .....

Ky Mayhew .....

Dated ...01/10/2015.....

1-510

# TUNBRIDGE TIER ROAD QUARRY

## TRAFFIC IMPACT ASSESSMENT

*FOR*

# HAZELL BROS GROUP PTY LTD

Submitted by:

TERRY EATON  
Traffic Engineer  
29 Carey's Road  
Bridgenorth TAS 7277  
TEL / FAX: 03 - 6330 1510

7<sup>th</sup> December 2015

## 1. Introduction

This traffic assessment is provided to assess likely impacts of a proposed extension of quarry activities at the existing Tunbridge Tier Quarry operated by Hazell Bros.

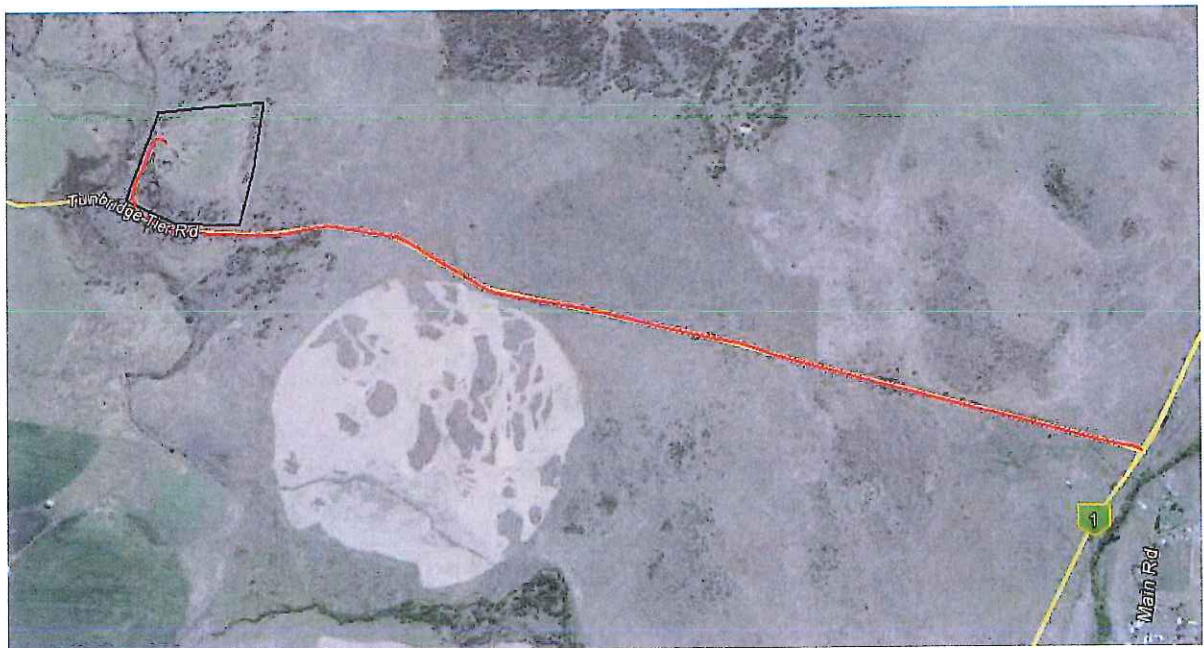
This report is to assess transport related activities for compliance with Section E4.0 Road and Railway Assets Code of the Northern Midlands Interim Planning Scheme.

The report has been prepared from information provided by Hazell Bros Group P/L and from a general appreciation of the locality.

## 2. The Site

The site is located indicatively four (3.82km) kilometres west of the Midland Highway on Tunbridge Tier Road.

### The Site, Tunbridge Tier Road Google Map



Access to the quarry is by an existing gravel driveway some 4 metres wide at the property boundary with throat width some 24 metres at the edge of seal. The driveway is generally at right angles to the road on an approach gradient of some 4%. A gravel turn in area is available on the opposite side of the road to provide for truck turns.

Sight distance at the driveway is:

- To east - some 180 metres
- To west - some 200 metres to the nearest road curve but with some 1 km available across roadside properties.



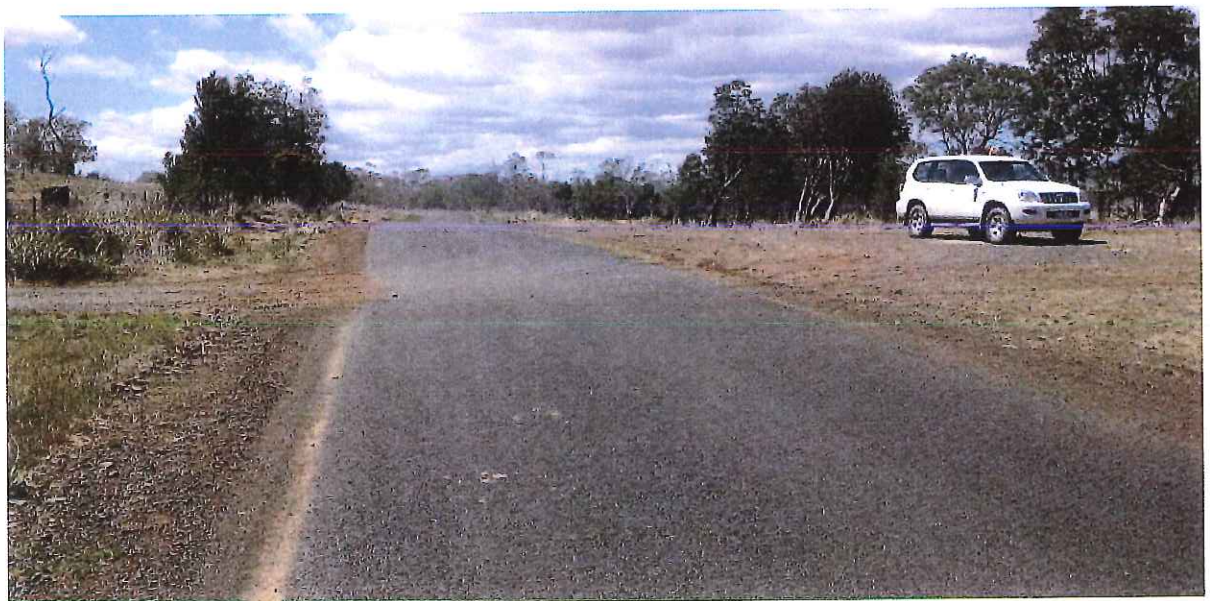
The present quarry licence is for the annual extraction of 5,000 m<sup>3</sup>, with this volume reduced from a previous 20,000m<sup>3</sup> limit some 20 years ago due to the lack of demand for the product material.

Existing cartage from the quarry uses combination vehicles with a payload of some 32 tonnes.

**Access and Egress off of Tunbridge Tier Road to the Quarry site**



**Pull-off Bay looking east, adjacent to the Quarry Entrance**



**Exiting the Quarry looking east with a clear view of 180 meters**



**Exiting the Quarry looking West with a clear view exceeding one thousand meters**



### **Accident Data**

The traffic crash listing (last 5 years) for the road network in close proximity to the site indicates no traffic or property damage accidents, generally distributed over the access / egress road network, suggesting a “safe” road system in proximity to the Quarry site.

### 3. The Proposal

The proposal is to increase the quarry material extraction licence from the present 5,000 m<sup>3</sup> per annum to 70,000 m<sup>3</sup> per annum to provide pavement materials for proposed Midland Highway upgrade works.

### 4. Road Facilities

#### Tunbridge Tier Road

This road is considered as a local rural road serving mainly agricultural and forestry land uses but with some recreational traffic to Lake Sorell and Lake Crescent where the road junctions with Interlaken Road which connects to Highland Lakes Road at Steppes.

The road use suggests a classification as equivalent to a Category 5 road in the planning scheme.

In the vicinity of the quarry the road is constructed with a sealed surface some 5.0 metres wide with 1.0 metre gravel shoulders, with a side drain in grassed verges at the site frontage.

The road alignment for the main cartage route from the quarry to Midland Highway is a series of straights and curves, with a relatively flat profile.

Hazell Bros hold a NHVR permit to operate vehicles up to 57.5 tonne vehicle mass on the road.

The road standard suggests a travel speed in the vicinity of the site of some 80 to 85 km/h.

#### Midland Highway Junction

The Midland Highway junction is developed to a high standard with entry turns from the highway via auxiliary turning lanes.

### 5. Traffic Data

#### Tunbridge Tier Road

Indicative ADT traffic volume less than 150 vehicles per day with minimum growth expected.

## Quarry

The present quarry activity (5,000m<sup>3</sup>) indicates some 250 truck loads per annum. Allowing for the economics of the quarry activity indicates the likelihood of material delivery as a batched operation indicative 30 loads per day ie some 10 days cartage per annum with some 60 two-way truck movements per day.

Extending the quarry to 70,000 m<sup>3</sup> increases the cartage task to some 112,000 tonnes.

The management plan is to operate a fleet of six trucks with a conservative turnaround of 1.5 hours allowing for loading / unloading indicates daily cartage up to some 40 loads, i.e. some 1,200 tonnes suggesting cartage at this rate will be over some 100 days with daily two-way truck traffic at some 80 vehicles.

Indicative other traffic associated with the site use is estimated at up to 20 two way movements daily

## 6. Assessment

Assessment in accord with Section E4.0 of the Interim Planning Scheme:

E4.6.1 P3(C) The existing driveway with entry / exit of large cartage vehicles is by use of an existing widened shoulder as a "G" turn on the opposite side of the sealed pavement from the gateway. The travel path avoids the tight turn from the sealed roadway and minimises pavement damage.

Upgrading the driveway for outward movements to comply with fig. 6.61 of Austroads is suggested to provide an exit turn path with minimum impact on the existing sealed surface by offsetting the gateway 20 metres from edge of seal and providing for approach / departure tapers.

Installation of advisory warning signs W5-22 "Truck" with attachment "Turning" plate on the approaches to the driveway some 140 metres distant is considered prudent.

Approach sight distance at the driveway, minimum value of 180 metres is just less than required for an 85 km/h approach speed but in excess of truck stopping sight distance for a 90 km/h approach speed with desirable 2.5 second reaction time and in excess of ASD (approach sight distance) for a 100 km/h approaching car.

Assessment of traffic efficiency suggests minimal impact with a traffic volume estimated at up to 180 vehicles per day with an estimated level of service "C" capacity of some 375 vehicles. Note, the minimum

increase in traffic is due to increasing the daily cartage rate above the present permitted quarry supply but with cartage extending from 10 days to 100 days.

Upgrading the driveway as suggested is considered appropriate to maintain an adequate level of safety and efficiency for Tunbridge Tier Road – deemed to comply.

- E4.7.1 A1 Not applicable as quarry more than 50 metres from a Category 1 road.
- E4.7.2 A2 The proposal is to use an existing access but with upgrading to protect the through road - deemed to comply
- E4.7.3 Not applicable
- E4.7.4 Refer to section E4.6.1 P3(c) above - deemed to comply

## 7. Conclusions

A traffic assessment for the proposed increase in material supply from an existing quarry on Tunbridge Tier Road indicates compliance with section E4.0 of the Northern Midlands Interim Planning Scheme provided upgrade of the driveway and installation of advisory signage as outlined in this report are given consideration.

**Terry Eaton**

# **Traffic Impact Assessment – Report Addendum**

**Tunbridge Tier Road Quarry**

FOR

**Hazell Bros Group Pty Ltd**

SUBMITTED BY:

TERRY EATON  
Traffic Engineer  
29 Carey's Road  
Bridgenorth TAS 7277  
TEL / FAX: (03) 6330 1510

APRIL 2018

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| 6. ASSESSMENT .....          | 5                            |
| 7. CONCLUSION .....          | 5                            |

### Attachment

Tunbridge Tier TIA of November 2015

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## 1. Introduction

This report is provided as an update to the previous traffic assessment of November 2015 for quarry activities at this site.

The reason for this update is to consider changes to the original traffic report as input to a quarry licence application for a proposed expansion of the quarry activity to double the material output from 70,000m<sup>3</sup> to 140,000 m<sup>3</sup>.

This assessment is limited to changes to the previous report as per the provisions of Section E4.0 of the Northern Midlands Council Interim Planning Scheme.

Comparison with the November 2015 report is as follows:

## 2. The Site – Proposal

No change to the location and driveway sight distance, some 180 metres to the east and 200 metres to the west.

The present quarry licence is for 70,000m<sup>3</sup> with details of the operation covered by the “Hazell Bros Group Pty Ltd, Tunbridge Tier Quarry – Increase in Production” report prepared by Integrated Land Management & Planning dated 22 March 2018.

Salient information to note relative to this report are:

- Increase in Production (m<sup>3</sup>)      70,000 to 140,000
- Increase in Production (t)      112,000 to 224,000
- Increase in cartage tasks      100 days to 200 days
- Hours of operation
  - Weekdays      7:00am to 7:00pm
  - Saturdays      8:00am to 4:00pm

The quarry is to mainly provide rock materials for major road contracts using combination trucks with a payload of some 32 tonnes. No change is proposed for the daily site works traffic, but the number of days for this demand will increase to up to twice the existing trips for the present licenced operation.



## ESTIMATED TRAFFIC DEMAND – Increased Production

| Heavy Vehicle Movements (Average Day) | Heavy Vehicle Movements (Maximum Day) | Light Vehicles Daily |
|---------------------------------------|---------------------------------------|----------------------|
| 24                                    | 40                                    | 6                    |

Improvements to the site access plus the installation of truck advisory signs as recommended in the November 2015 report are in place:



Quarry entrance junction complies.

Trucks warning sign on the east approach

#### 4. Road Facilities

As per the November 2015 report

#### 5. Traffic Data

- **Tunbridge Tier Road**

Considering the previous estimate of up to 150 vehicles per day using this road plus the quarry operation at an average daily traffic (ADT) of some 30 vehicles suggests a maximum ADT in the order of 180 vehicles.

- **Quarry**

Based on a similar cartage regime as per the November 2015 report with an increase in average load to 32 tonnes suggests cartage to be over some 190 to 200 days. This suggests an increase in the ADT of some 30 vehicles.

Note, the light vehicle site demand has been assessed as per the previous report at 20 two-way movements per day – allowing for site workers, supplies and plant operation provisions.

### 3. Assessment

Assessment in accord with Section E4.0 of the Northern Midlands Planning Scheme indicates:

#### E4.6.1 P3 (c)

- Access upgrade requirements as per the November 2015 report complete - complies
- Advisory "Truck" warning signs installed - complies
- Approach sight distance - complies
- Traffic Efficiency  
Increase in ADT from 180 vehicles to 210 vehicles is well below the estimated level of service "C" capacity of some 375 vehicles  
- No traffic efficiency impact

No amendment is required to code provisions E4.7.1 A1 to E4.7.4 as outlined in the November 2015 report.

### 4. Conclusion

A traffic assessment for the proposed increase in material supply from 70,000m<sup>3</sup> to 140,000m<sup>3</sup> for the Hazell Bros quarry operation at Tunbridge Tier Road indicates compliance with Section E4.0 of the Northern Midlands Interim Planning Scheme.

**Terry Eaton**

# TUNBRIDGE TIER ROAD QUARRY

## TRAFFIC IMPACT ASSESSMENT

*FOR*

# HAZELL BROS GROUP PTY LTD

Submitted by:

TERRY EATON

Traffic Engineer

29 Carey's Road

Bridgenorth TAS 7277

TEL / FAX: 03 - 6330 1510

November 2015

---

## 1. Introduction

This traffic assessment is provided to assess likely impacts of a proposed extension of quarry activities at the existing Tunbridge Tier Quarry operated by Hazell Bros.

This report is to assess transport related activities for compliance with Section E4.0 Road and Railway Assets Code of the Northern Midlands Interim Planning Scheme.

The report has been prepared from information provided by Hazell Bros Group P/L and from a general appreciation of the locality.

## 2. The Site

The site is located indicatively four (3.82km) kilometres west of the Midland Highway on Tunbridge Tier Road.

### The Site, Tunbridge Tier Road Google Map



Access to the quarry is by an existing gravel driveway some 4 metres wide at the property boundary with throat width some 24 metres at the edge of seal. The driveway is generally at right angles to the road on an approach gradient of some 4%. A gravel turn in area is available on the opposite side of the road to provide for truck turns.

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Sight distance at the driveway is:

- To east - some 180 metres
- To west - some 200 metres to the nearest road curve but with some 1 km available across roadside properties.

The present quarry licence is for the annual extraction of 5,000 m<sup>3</sup>, with this volume reduced from a previous 20,000m<sup>3</sup> limit some 20 years ago due to the lack of demand for the product material.

Existing cartage from the quarry uses combination vehicles with a payload of some 32 tonnes.

**Access and Egress off of Tunbridge Tier Road to the Quarry site**



**Pull-off Bay looking east, adjacent to the Quarry Entrance**



**Exiting the Quarry looking east with a clear view of 180 meters**



**Exiting the Quarry looking West with a clear view exceeding one thousand meters**



#### **Accident Data**

The traffic crash listing (last 5 years) for the road network in close proximity to the site indicates no traffic or property damage accidents, generally distributed over the access / egress road network, suggesting a “safe” road system in proximity to the Quarry site.

### **3. The Proposal**

The proposal is to increase the quarry material extraction licence from the present 5,000 m<sup>3</sup> per annum to 70,000 m<sup>3</sup> per annum to provide pavement materials for proposed Midland Highway upgrade works.

### **4. Road Facilities**

#### **Tunbridge Tier Road**

This road is considered as a local rural road serving mainly agricultural and forestry land uses but with some recreational traffic to Lake Sorell and Lake Crescent where the road junctions with Interlaken Road which connects to Highland Lakes Road at Steppes.

The road use suggests a classification as equivalent to a Category 5 road in the planning scheme.

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In the vicinity of the quarry the road is constructed with a sealed surface some 5.0 metres wide with 1.0 metre gravel shoulders, with a side drain in grassed verges at the site frontage.

The road alignment for the main cartage route from the quarry to Midland Highway is a series of straights and curves, with a relatively flat profile.

Hazell Bros hold a NHVR permit to operate vehicles up to 57.5 tonne vehicle mass on the road.

The road standard suggests a travel speed in the vicinity of the site of some 80 to 85 km/h.

### **Midland Highway Junction**

The Midland Highway junction is developed to a high standard with entry turns from the highway via auxiliary turning lanes.

## **5. Traffic Data**

### **Tunbridge Tier Road**

Indicative ADT traffic volume less than 150 vehicles per day with minimum growth expected.

### **Quarry**

The present quarry activity (5,000m<sup>3</sup>) indicates some 250 truck loads per annum. Allowing for the economics of the quarry activity indicates the likelihood of material delivery as a batched operation indicative 30 loads per day i.e. some 10 days cartage per annum with some 60 two-way truck movements per day.

Extending the quarry to 70,000 m<sup>3</sup> increases the cartage task to some 112,000 tonnes.

The management plan is to operate a fleet of six trucks with a conservative turnaround of 1.5 hours allowing for loading / unloading indicates daily cartage up to some 40 loads, i.e. some 1,200 tonnes suggesting cartage at this rate will be over some 100 days with daily two-way truck traffic at some 80 vehicles.

Indicative other traffic associated with the site use is estimated at up to 20 two way movements daily

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## 6. Assessment

Assessment in accord with Section E4.0 of the Interim Planning Scheme:

E4.6.1 P3(C) The existing driveway with entry / exit of large cartage vehicles is by use of an existing widened shoulder as a "G" turn on the opposite side of the sealed pavement from the gateway. The travel path avoids the tight turn from the sealed roadway and minimises pavement damage.

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Upgrading the driveway as suggested is considered appropriate to maintain an adequate level of safety and efficiency for Tunbridge Tier Road. - deemed to comply

- |           |   |
|-----------|---|
| E4.7.1 A1 | Not applicable as quarry more than 50 metres from a Category 1 road.  |
| E4.7.2 A2 | The proposal is to use an existing access but with upgrading to protect the through road - deemed to comply |
| E4.7.3    | Not applicable  |
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## 7. Conclusions

A traffic assessment for the proposed increase in material supply from an existing quarry on Tunbridge Tier Road indicates compliance with section E4.0 of the Northern Midlands Interim Planning Scheme provided upgrade of the driveway and installation of advisory signage as outlined in this report are given consideration.

Terry Eaton

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# BUILDING SURVEYING SERVICES PTY LTD

Phone: (03) 6391 1122 [building@buildingsurveyingservices.com.au](mailto:building@buildingsurveyingservices.com.au) Mobile: 0487 343310

7 Marlborough Street LONGFORD TAS 7301 & Suite 1/ 27 Cattley Street BURNIE TAS 7320

ABN: 51 616 421 777

## STANDARD OF WORK CERTIFICATE - BUILDING WORK

Section 103  
Section 151

To: Wayne Steven Wilson *Building Surveyor* Form  
Building Surveying Services Pty Ltd *Address* 71 A  
7 Marlborough Street *Suburb/postcode*  
LONGFORD TAS 7301

### Builder details:

Builder: Denis Jeffrey & Carol Patricia Wynwood Category: Owner Builder  
Business Name: 3 Glenelg Street Phone No: 0418 518 349  
Address: CAMPBELLTOWN TAS 7210 Fax No:  
Licence No: FOL/18/5190 Email address: [denniswynwood@hotmail.com](mailto:denniswynwood@hotmail.com)

### Owner details:

Note: Copy **MUST** be forwarded to Owner

Owner: Denis Jeffrey & Carol Patricia Wynwood Contact person: Denis Wynwood  
Address: 3 Glenelg Street Phone No: 0418 518 349  
CAMPBELLTOWN TAS 7210 Phone No:  
Email address: [denniswynwood@hotmail.com](mailto:denniswynwood@hotmail.com)

### Details of Building work:

Type of work: Permit work  Notifiable work  (*X one applicable*)  
Certificate of Likely Compliance No: BSS/2018/112 Permit or Certificate of Likely Compliance No: P18-035  
Address: 3 Glenelg Street Lot No: 1  
CAMPBELLTOWN TAS 7210 Certificate of title: 204671  
PID: 6201970  
Description of Building: Proposed new covered roof area over existing deck  
Type of work: New Building (*new building / alteration / addition / repair / demolition / removal / re-erection / other*)  
Use of building: Covered roof area (*main use*) Building class: 10a

### Builder Standard of Work Statement:

I confirm I am the *Licensed Builder* responsible for the construction and supervision of the above referenced project. Having supervised and/or carried out the building work, I confirm that:

- all building work is complete; and
- all directions given under the *Building Act 2016* and *Building Regulations 2016* have been complied with; and
- the building work as constructed is in compliance with the National Construction Code, the approved plans, specifications and conditions of the Certificate of Likely Compliance (or a Building Permit) granted for the work

Builder: Denis Jeffrey Wynwood *Name: [print]* Signed: *[Signature]* Date: 04/07/2018

Level 6, 134 Macquarie Street, Hobart TAS  
GPO Box 1550, Hobart, TAS 7001 Australia

Enquiries: Danielle McPhail  
Ph: +61 3 6165 4571  
Email: danielle.mcphail@epa.tas.gov.au  
Web: www.epa.tas.gov.au  
Our Ref: EN-EM-EV-DE-254977/H862553/\_2A\_CouncilLetter\_3ABC\_Decision



ENVIRONMENT PROTECTION AUTHORITY

13 June 2018

Mr Des Jennings  
General Manager  
Northern Midlands Council  
PO Box 156  
LONGFORD TAS 7301

Email: planning@nmc.tas.gov.au

Dear Mr Jennings

|                           |  |  |      |  |  |
|---------------------------|--|--|------|--|--|
| NORTHERN MIDLANDS COUNCIL |  |  |      |  |  |
| Location                  |  |  |      |  |  |
| File No.                  |  |  |      |  |  |
| Property                  |  |  |      |  |  |
| Attachments               |  |  |      |  |  |
| REC'D 18 JUN 2018         |  |  |      |  |  |
|                           |  |  |      |  |  |
| GM                        |  |  | MYR  |  |  |
| P&DM                      |  |  | CRS  |  |  |
| CSM                       |  |  | PLAN |  |  |
| E&DM                      |  |  | BLD  |  |  |
| WM                        |  |  | HLT  |  |  |
| HR                        |  |  |      |  |  |

**DETERMINATION ON ENVIRONMENTAL IMPACT ASSESSMENT  
PERMIT APPLICATION (P18-047)  
HAZELL BROS GROUP – TUNBRIDGE TIER QUARRY INCREASE IN PRODUCTION,  
TUNBRIDGE**

I am writing to you about the above permit application which was referred to the Board of the Environment Protection Authority (the Board) for assessment under the *Environmental Management and Pollution Control Act 1994* (EMPC Act) and received on 28 March 2018.

The Board has delegated to me its functions and powers in relation to section 25 of the EMPC Act.

The Board's environmental impact assessment of the application is now complete. All supporting information and any relevant comments received from the public and relevant government agencies were taken into account.

In accordance with section 25(5) of the EMPC Act, I am notifying Northern Midlands Council that the conditions and restrictions in the enclosed Permit Part B, together with the definitions in Schedule 1 and the associated attachments, must be contained in any permit granted in respect of the application by Council under the provisions of the *Land Use Planning and Approvals Act 1993*.

A copy of the Environmental Assessment Report (EAR) detailing the reasons for the Board's decision is attached. The Assessment Report is also available on the EPA website at <http://epa.tas.gov.au/assessment/completed-assessments>. Permit Part B is provided as Appendix 1 of the EAR.

Please note that, to satisfy the requirements of section 25(8) of the EMPC Act, the Council must:

- not include any other condition or restriction which is inconsistent with, or which extends the operation of, any conditions or restrictions which the Board requires to be contained in the permit; and
- notify the Board of its decision to grant or refuse to grant a permit; and
- at the same time as it notifies the applicant of its decision on the application, provide the EAR, including attachments (or a link to the EAR on the EPA website) to the applicant, and anyone who made representations.

It is suggested Council:

- Call the Council's portion of the permit 'Part A';
- include a condition in 'Part A' along the lines of 'The person responsible for the activity must comply with the conditions contained in Schedule 2 of Permit Part B, which the Board of the Environment Protection Authority (EPA) has required the planning authority to include in the permit, pursuant to section 25(5) of the *Environmental Management and Pollution Control Act 1994*', and
- attach the enclosed Permit Part B to the permit, including Schedules 1, 2 and 3 and any attachments.

I understand Council will advise the applicant and any representors of appeal rights in relation to its decision.

If a permit is granted, please provide EPA Tasmania with a full copy of the final permit (including all attachments).

If you have any queries regarding the above, please contact Danielle McPhail on (03) 6165 4571.

Yours sincerely



Wes Ford  
**DIRECTOR, ENVIRONMENT PROTECTION AUTHORITY**  
**Delegate for the Board of the Environment Protection Authority**

Encl.

- *Permit Part B – Permit Conditions Environmental No. 9830*
- *Environmental Assessment Report*

# ENVIRONMENTAL ASSESSMENT REPORT

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## Tunbridge Tier Quarry Upgrade

*78 Tunbridge Tier Rd, Tunbridge*

Hazell Bros. Group Pty Ltd

Board of the Environment Protection Authority

June 2018



| <b>Environmental Assessment Report</b> |                                     |
|--|-------------------------------------|
| Proponent                              | Hazell Bros. Group Pty Ltd          |
| Proposal                               | Tunbridge Tier Quarry Upgrade       |
| Location                               | 78 Tunbridge Tier Rd, Tunbridge     |
| NELMS no.                              | PCE No. 9830                        |
| Permit application no.                 | P18-047 (Northern Midlands Council) |
| Doc1 folder                            | EN-EM-EV-DE-254977                  |
| Doc1 no.                               | H862553                             |
| Class of Assessment                    | 2A                                  |

| <b>Assessment process milestones</b> |   |
|--------------------------------------|---|
| 5/02/2018                            | Permit application submitted to Council             |
| 28/03/2018                           | Referral received by Board                          |
| 16/04/2018                           | EER Guidelines issued                               |
| 28/04/2018                           | Start of public consultation period                 |
| 14/05/2018                           | End of public consultation period                   |
| 28/05/2018                           | Draft conditions forwarded to proponent for comment |
| 21/06/2018                           | Statutory Period for Assessment Ends                |

| <b>Acronyms</b> |  |
|-----------------|--|
| BMP             | Blast Management Plan  |
| Board           | Board of the Environment Protection Authority                              |
| DPIPWE          | Department of Primary Industries, Parks, Water and Environment             |
| EIA             | Environmental Impact Assessment  |
| EMPC Act        | <i>Environmental Management and Pollution Control Act 1994</i>             |
| EMPCS           | Environmental Management and Pollution Control System                      |
| EPBC Act        | <i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i> |
| EER             | Environmental Effects Report   |
| LUPA Act        | <i>Land Use Planning and Approvals Act 1993</i>                            |
| MRT             | Mineral Resources Tasmania   |
| PCAB            | Policy and Conservation Advice Branch                                      |
| PCE             | Permit Conditions – Environmental  |
| QCoP            | <i>Quarry Code of Practice (DPIPWE, 2017)</i>                              |
| RMPS            | Resource Management and Planning System                                    |
| SD              | Sustainable Development  |
| TIA             | Traffic Impact Assessment  |
| NC Act          | <i>Nature Conservation Act 2002</i>  |
| TSP Act         | <i>Threatened Species Protection Act 1995</i>                              |
| WM Act          | <i>Weed Management Act 1999</i>  |



## Report summary

This report provides an environmental assessment of Hazell Bros. Group Pty Ltd's proposed Tunbridge Tier Quarry upgrade.

The proposal involves an upgrade of an existing dolerite quarry located 3.8 km west of the township of Tunbridge off Tunbridge Tier Road. The proponent is seeking approval to increase the maximum permitted production from 70,000m<sup>3</sup> to 140,000m<sup>3</sup> of dolerite-derived products per annum. The proposal includes blasting, crushing and screening of materials.

This report has been prepared based on information provided by the proponent in the Environmental Effects Report (EER). Relevant government agencies and the public have been consulted and their submissions and comments considered as part of this assessment.

Further details of the assessment process are presented in section 1 of this report. Section 2 describes the statutory objectives and principles underpinning the assessment. Details of the proposal are provided in section 3. Section 4 reviews the need for the proposal and considers the proposal, site and design alternatives. Section 5 summarises the public and agency consultation process. The detailed evaluation of environmental issues is in section 6. The report conclusions are contained in section 7.

The environmental permit conditions in Appendix 1 are a new set of operating conditions for the entire, intensified activity that will supersede the existing permit conditions.

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## 1 Approvals process

An application for a permit under the *Land Use Planning and Approvals Act 1993* (LUPA Act) in relation to the proposal was submitted to Northern Midlands Council on 5 February 2018.

The proposal is defined as two 'level 2' activities under clauses 5(a) and 6(a)(ii), Schedule 2 of the *Environmental Management and Pollution Control Act 1994* (EMPC Act), being production of more than 5,000 cubic metres of rock or gravel per year; and materials handling (crushing / screening) of rocks, ores or minerals in excess of 1,000 cubic metres per year.

Section 25(1) of the EMPC Act required Council to refer the application to the Board of the Environment Protection Authority (the Board) for assessment under the Act. The application was received by the Board on 28 March 2018.

The assessment has been undertaken by the Director, Environment Protection Authority under delegation from the Board.

The Board required that information to support the proposal be provided in the form of an Environmental Effects Report (EER) prepared in accordance with guidelines issued by the Board on 16 April 2018.

Several drafts of the EER were submitted to the EPA for comment prior to its finalisation and acceptance on behalf of the Board. The final EER was submitted to Council with the permit application. The EER was released for public inspection for a 14-day period commencing on 28 April 2018. An advertisement was placed in *The Examiner* and on the EPA website. The EER was also referred at that time to relevant government agencies for comment. No public submissions were received.

## 2 SD objectives and EIA principles

The proposal must be considered by the Delegate in the context of the objectives of the Resource Management and Planning System of Tasmania (RMPS), and in the context of the objectives of the Environmental Management and Pollution Control System (EMPCS) (both sets of objectives are specified in Schedule 1 the EMPC Act). The functions of the Board are to administer and enforce the provisions of the Act, and in particular, to use its best endeavours to further the RMPS and EMPCS objectives.

The Delegate must undertake the assessment of the proposal in accordance with the Environmental Impact Assessment Principles defined in Section 74 of the EMPC Act.

### 3 The proposal

The main characteristics of the proposal are summarised in Table 1. A detailed description of the proposal is provided in Section 1 of the EER.

**Table 1: Summary of the proposal's main characteristics**

| Activity  |  |
|---|--|
| Extraction, crushing and screening of a maximum of 140,000 cubic metres of dolerite-derived products per annum. |  |
| Location and planning context   |  |
| <b>Location</b>   | 78 Tunbridge Tier Road, Tunbridge.<br>The Land is defined as that area within the boundary of mining lease 1502P/M (Figure 1).   |
| <b>Land zoning</b>  | Rural resource ( <i>Northern Midlands Interim Planning Scheme 2013</i> ).  |
| <b>Land tenure</b>  | Private, located within PID 6832983 (CT 131849/1) and PID 3438163 (CT 170439/4).   |
| <b>Mining lease</b>   | 1502P/M  |
| <b>Lease area</b>   | 32 hectares  |
| <b>Bond</b>   | Mineral Resources Tasmania (MRT) advised security deposit will remain \$60,000 based on 6 ha disturbed.  |
| Existing site   |  |
| <b>Land Use</b>   | Formerly grazing land. There is a current level 2 quarry operating at the site (70,000 m <sup>3</sup> per annum).  |
| <b>Topography</b>   | The quarry is situated on a low hummock in a landscape with generally low relief. A watercourse, a tributary to the Blackman River, runs approximately 50m to the west of the mining lease.  |
| <b>Geology</b>  | Dolerite (tholeiitic) with locally developed granophyre. The western edge of the mining lease also contains sand gravel and mud of alluvial, lacustrine and littoral origin.   |
| <b>Soils</b>  | Dolerite derived red-brown medium clay.  |
| <b>Hydrology</b>  | The quarry is located within the Macquarie River catchment. A tributary to the Blackman River (which eventually reports to the Macquarie River), runs approximately 50m to the west of the mining lease. This natural watercourse is located within a flat and waterlogged area containing swampy wetlands (Figure 3). |
| <b>Fauna</b>  | There are no records on the mining lease of threatened fauna species. However, potential habitat for EPBC Act listed fauna species exists within the mining lease.   |

|  |   |
|--|---|
| <p><b>Flora</b></p>                                    | <p>A flora and fauna study was conducted for the increase in production assessment and was completed in 2016. The studies from this assessment were utilised in this assessment.</p> <p>Quarry area predominantly agricultural land and rock-plat grassland. Both are not listed as threatened under the Nature Conservation Act.</p> <p>Nine threatened plant species listed under the TSP Act were identified within the mining lease. A permit to take was granted for the removal of speargrass (<i>Austrostipa sp.</i>) from within the quarry footprint. A number of areas of the mining lease, outside of the quarry footprint were cordoned off in accordance with conditions of the permit for the previous increase in production.</p> <p>The threatened vegetation community <i>Eucalyptus amygdalina</i> inland forest and woodland on Cainozoic deposits has been identified within the mining lease and is listed under the Nature Conservation Act. Two additional flora species, being lowland <i>Poa labillardierei</i> grassland and lowland <i>Themeda triandra</i> grassland were identified within the mining lease.</p> |
| <p><b>Local region</b></p>                             |   |
| <p><b>Climate</b></p>                                  | <p>Winds are predominantly from the north with sub-dominate winds from the south and west (Ross (the Boulevards) station).</p> <p>The average annual rainfall is 389 mm (Tunbridge (Austin-Vale) station).</p> <p>The mean maximum and minimum temperature is 17.7 and 5.6 degrees Celsius respectively (Ross (the Boulevards) station).</p>  |
| <p><b>Surrounding land zoning, tenure and uses</b></p> | <p>The surrounding land is private freehold and is zoned as rural resource under the <i>Northern Midlands Interim Planning Scheme 2013</i>. The surrounding land is predominantly utilised for agricultural purposes.</p> <p>There is a public reserve administered under the <i>Crown Lands Act 1976</i> located approximately 550m west of the mining lease.</p>  |

|   |   |
|---|---|
| <b>Species of conservation significance</b> | <p>The following threatened flora species / community have been recorded within the mining lease area (refer to the Ecological Assessment Report in Appendix 3 of the EER):</p> <ul style="list-style-type: none"> <li>• Grassland Riceflower (<i>Pimelea</i> sp. <i>Tunbridge</i>);</li> <li>• Chocolate Lily (<i>Arthropodium strictum</i>);</li> <li>• Knotty Speargrass (<i>Austrostipa nodosa</i>);</li> <li>• Sickle Speargrass (<i>Austrostipa scabra</i> subsp. <i>falcata</i>);</li> <li>• Pretty Pearlflower (<i>Cryptandra amara</i>);</li> <li>• Tufted Knawel (<i>Scleranthus diander</i>);</li> <li>• Grassland Candles (<i>Stackhousia subterranea</i>);</li> <li>• Smooth New-Holland-Daisy (<i>Vittadinia burbridgeae</i>);</li> <li>• Fuzzy New-Holland-Daisy (<i>Vittadinia cuneata</i> var. <i>cuneata</i>);</li> <li>• Woolly New-Holland-Daisy (<i>Vittadinia gracilis</i>);</li> <li>• Lowland <i>Poa labillardierei</i> Grassland;</li> <li>• Lowland <i>Themeda triandra</i> Grassland; and</li> <li>• <i>Eucalyptus amygdalina</i> inland forest and woodland on Cainozoic deposits.</li> </ul> <p>Additionally the natural watercourse and wetland area located adjacent to the western side of the mining lease supports Saline aquatic herbland which is listed under the Nature Conservation Act.</p> <p>No threatened fauna was detected by on-ground surveys within the mining lease, however, potential habitat for the following species has been identified (Appendix 3 of the EER):</p> <ul style="list-style-type: none"> <li>• Tasmanian Devil (<i>Sarcophilus harrisi</i>);</li> <li>• Spotted-tailed Quoll (<i>Dasyurus maculatus</i> subsp. <i>maculatus</i>);</li> <li>• Tasmanian Masked Owl (<i>Tyto novaehollandiae</i> subsp. <i>castanops</i>);</li> <li>• Tussock Skink (<i>Pseudemoia pagenstecheri</i>); and</li> <li>• Eastern Barred Bandicoot (<i>Perameles gunnii</i> subsp. <i>gunnii</i>).</li> </ul> |
| <b>Proposed infrastructure</b>              |   |
| <b>Major equipment</b>                      | <ul style="list-style-type: none"> <li>• Wheel loader (Cat 966);</li> <li>• Jaw Crusher (Sandvick UJ 440);</li> <li>• Cone Crusher (45" Eljay);</li> <li>• Screen (Extec E7);</li> <li>• Auspactor VSI;</li> <li>• 6 light combination trucks (approx. 32 tonne loads);</li> <li>• Drill rig (Sandvick 900); and</li> <li>• Excavator (Komatsu PC300).</li> </ul>   |
| <b>Other infrastructure</b>                 | <ul style="list-style-type: none"> <li>• Conveyer(s);</li> <li>• Site drainage (intercept drains and a culvert);</li> <li>• Sediment retention basin (existing);</li> <li>• Access road and gate (existing);</li> <li>• Relocatable toilets (e.g. porta-loos);</li> <li>• Service / refuelling vehicles; and</li> <li>• Product and overburden / top soil stockpiles / windrows.</li> </ul>   |

| <b>Inputs</b>                      |   |
|------------------------------------|---|
| <b>Water</b>                       | Water for dust suppression (for wetting of loads or use of water jets on the conveyor).   |
| <b>Energy</b>                      | Fuel and lubricants for the equipment noted above will be brought onto the site in utility vehicles.                                    |
| <b>Other raw materials</b>         | Explosives brought onto the site as required.   |
| <b>Wastes and emissions</b>        |   |
| <b>Liquid</b>                      | Stormwater runoff from extraction / stockpile areas. Relocatable toilet holding tanks.  |
| <b>Atmospheric</b>                 | Dust from internal and external traffic, materials handling, blow-off from stockpiles, screening/crushing and blasting.                 |
| <b>Solid</b>                       | General refuse including food scraps, paper, packaging and any wastes associated with machine repairs / routine servicing of equipment. |
| <b>Controlled wastes</b>           | Nil.  |
| <b>Noise</b>                       | Noise from crushing and screening, excavating, vehicle movements on site and going to and from the site, drilling and blasting.         |
| <b>Greenhouse gases</b>            | Use of machinery and vehicles will consume fossil fuels and produce greenhouse gas emissions.   |
| <b>Construction and operations</b> |   |
| <b>Proposal timetable</b>          | Increase in production will respond to any contracts once approvals are granted.  |
| <b>Operating hours (ongoing)</b>   | 0700 to 1900 hours, Monday to Friday.<br>0800 to 1600 hours Saturday.<br>No work on Sunday or Public Holidays.                          |

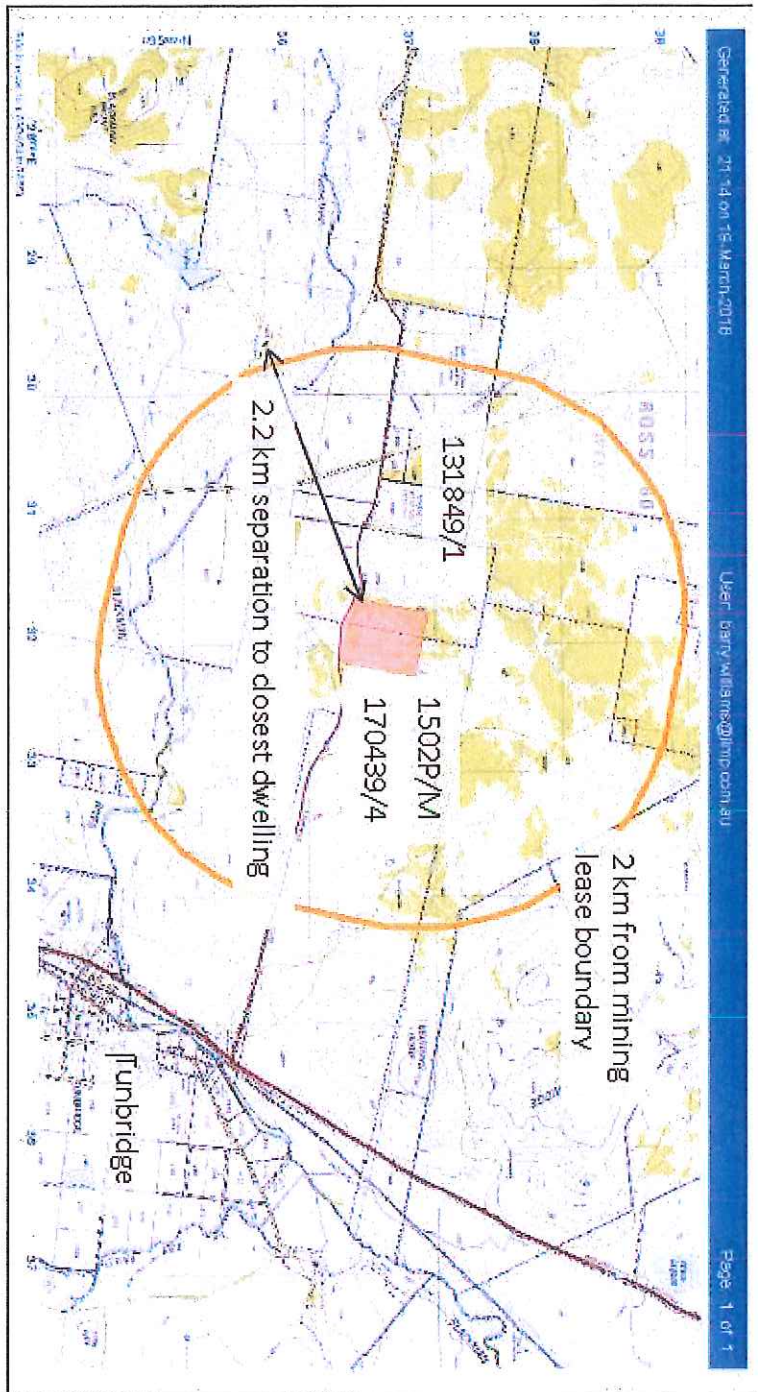


Figure 1: Location of Tunbridge Tier Quarry – Mining Lease 1502P/M (Figure 1 of the EER)



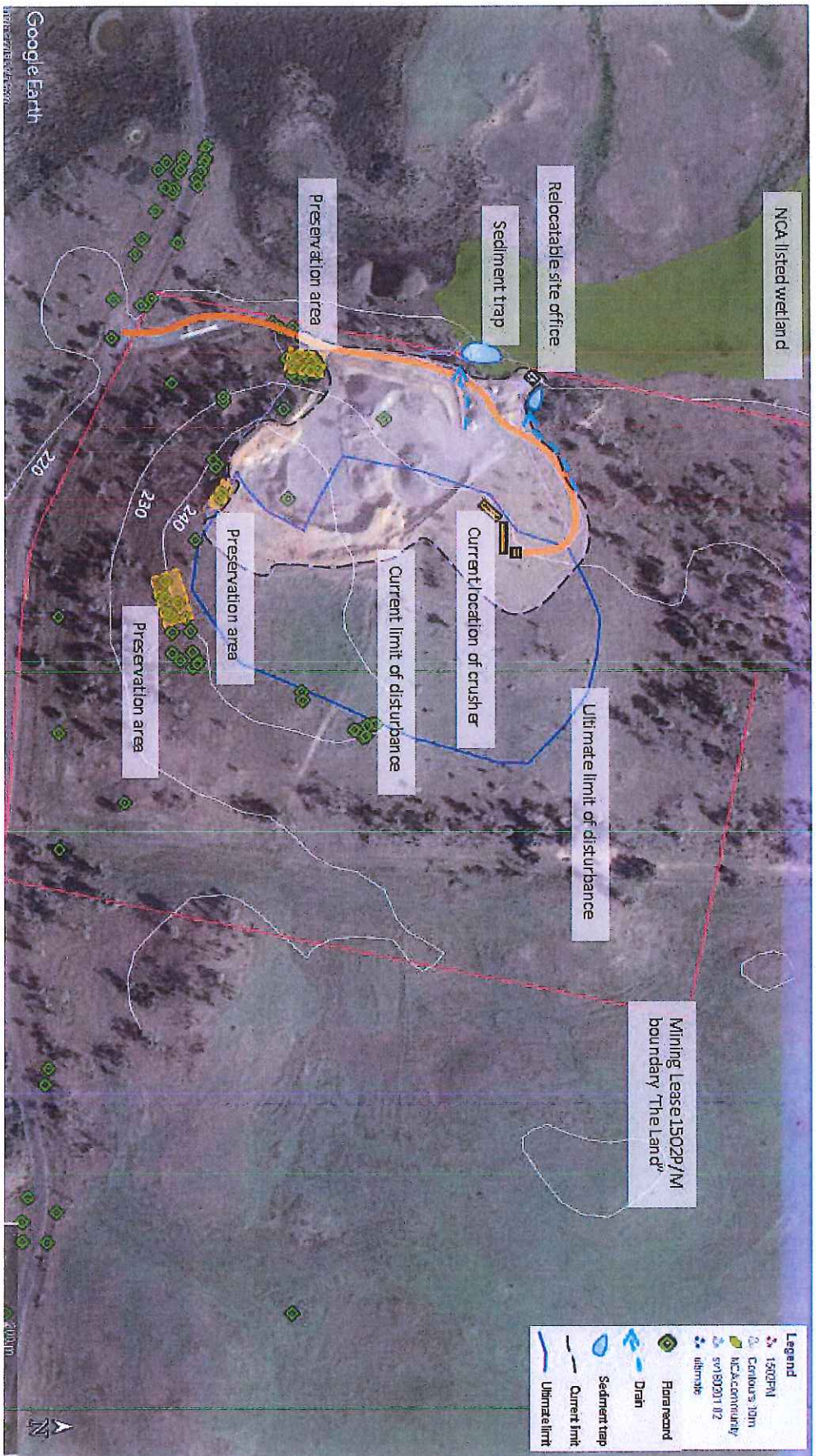


Figure 2: Site plan showing mining lease 1502P/M and the existing and ultimate footprint of the quarry (Figure 2 of the EER).

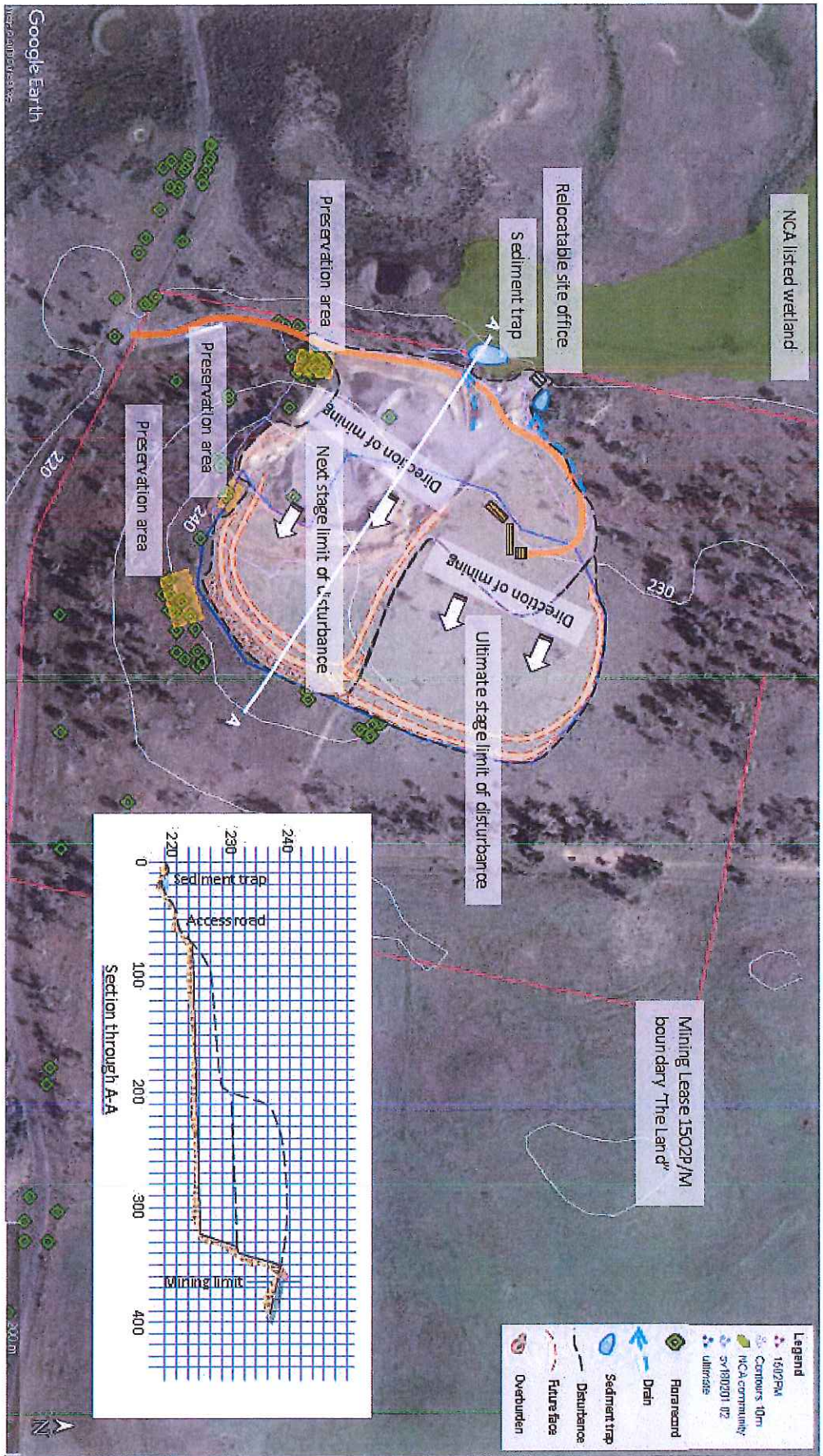
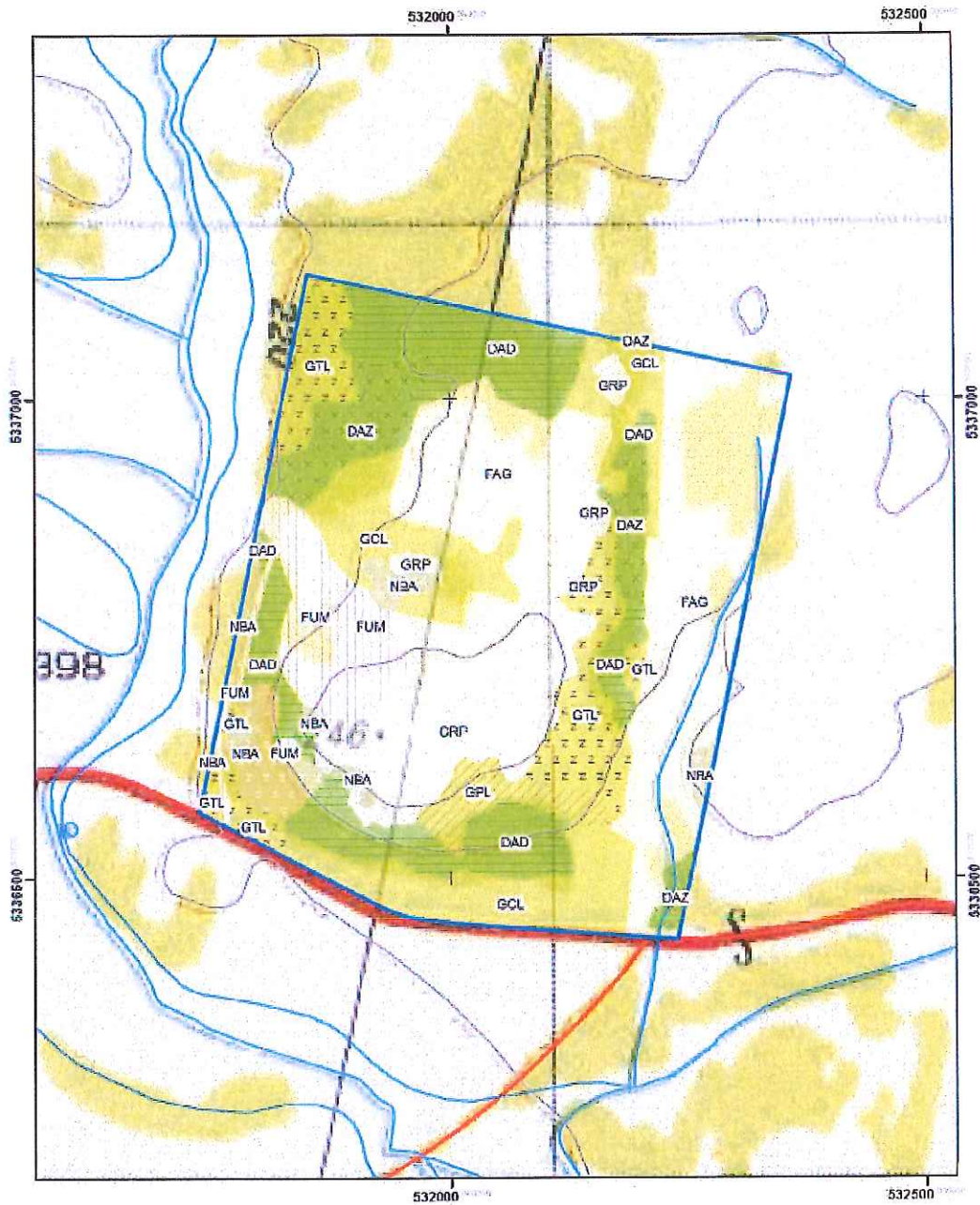


Figure 3: Future stages and limits of disturbance (Figure 3 of the EER).



| TasVeg Code | Community Name  | TasVeg Code | Community Name                              |
|-------------|---|-------------|---|
| DAD         | <i>Eucalyptus amygdalina</i> forest and woodland on dolerite                  | GPL         | Lowland <i>Poa labillardierei</i> grassland |
| DAZ         | <i>Eucalyptus amygdalina</i> inland forest and woodland on Cainozoic deposits | GRP         | Rockplate grassland                         |
| FAG         | Agricultural land   | GTL         | Lowland <i>Themeda triandra</i> grassland   |
| FUM         | Extra-urban miscellaneous   | NBA         | <i>Bursaria - Acacia</i> woodland and scrub |
| GCL         | Lowland grassland complex   |             |   |

Figure 4: Revised vegetation community mapping (Figure 6 of the Ecological Assessment Report).



Figure 5: Mining lease 1502PM showing the tributary to the west of the mining lease and Blackman River (LISTmap, February 2016).

## 4 Need for proposal and alternatives

According to Section 4 of the EER:

*The Tunbridge Tier Quarry was originally established to supply aggregates and gravels for road construction projects in the Tunbridge region. The State Government has recently announced that an extensive program of Midland Highway Upgrade works will be delivered over the next 10 years.*

*There are few quality dolerite quarries located in the central portion of the Midland Highway. An upgraded Tunbridge Tier Quarry will be ideally located to service road construction projects on the Midland Highway without extensive cartage distances and costs. The alternative would be to supply the road construction projects on the Midland Highway by carting product from major quarries in the south or north. The extra cartage would add to the cost of the materials which would be reflected in the contract prices paid by the government and hence taxpayers. Furthermore, this alternative would add more heavy vehicles to the already significant freight load carried by the Midland Highway, which would add to the maintenance, congestion and frustration experienced by other road users.*

## 5 Public and agency consultation

No public representations were received. The EER was referred to a number of government agencies with an interest in the proposal. A response was received from Mineral Resources Tasmania.

The following Divisions/areas of the Department of Primary Industries, Parks, Water and Environment also provided submissions on the EER:

- Regulator, Extractive Unit, EPA Tasmania
- Noise Specialist, EPA Tasmania
- Policy and Conservation Advice Branch, Natural and Cultural Heritage Division.

## 6 Evaluation of environmental issues

EPA Tasmania has evaluated the environmental issues considered relevant to the proposal. Details of this evaluation, along with the permit conditions required by the Director, are discussed below.

|   |
|---|
| <b>Issue 1: Flora, fauna and weed/disease management</b>  |
| <b>Description of potential impacts</b>   |
| <p>Impacts to threatened flora, fauna and vegetation communities may occur if the activity is not appropriately located, designed, developed and managed. As detailed in Table 1 of the EAR, ecological surveys completed for the previous upgrade of the quarry in 2015 identified threatened vegetation communities and flora species within the mining lease (see Figures 2 and 3 of the EAR). The study also identified the potential for foraging habitat for listed threatened fauna.</p> <p>The conditions of the previous permit required the delineation and protection of certain listed flora species. Three areas containing listed threatened species were delineated and protected from disturbance. These areas are shown as yellow rectangles in Figures 2 and 3 of the EAR. According to the EER, these areas continue to be maintained and protected from disturbance. No change to the area of disturbance currently approved for the quarry is proposed.</p> <p>The previous ecological survey also identified a number of species listed under the <i>Weed Management Act 1999</i>. According to the EER these have been managed in accordance with a Weed Management Plan. The Ecological Assessment noted that no diseases (e.g. phytophthora, myrtle rust etc.) were expected and that there was no evidence present at the site of any flora or fauna diseases. There remains the potential for weeds to be spread on the site and potentially off-site, unless appropriately managed.</p> |
| <b>Management measures proposed in EER</b>  |
| <p>The following management commitments were proposed in the EER:</p> <ul style="list-style-type: none"> <li>• EER Commitment 1 – <i>Future stripping will be undertaken with consideration to the boundaries of the various vegetation communities on the fringe of the development area.</i></li> <li>• EER Commitment 2 – <i>All existing preservation fencing will be retained for the life of the quarry.</i></li> <li>• EER Commitment 3 – <i>Future clearing will be contained within approved future development area. No future permits are anticipated.</i></li> <li>• EER Commitment 4 – <i>The original Weed Management Plan has been updated, submitted for approval and will be kept current.</i></li> </ul>  |
| <b>Public and agency comment</b>  |
| <p>Policy and Conservation Advice Branch commented that, although there is no suitable habitat present on the property for Tasmanian devil (<i>Sarcophilus harrisii</i>) dens, there are a number of records of Tasmanian devils within 1 km of the property. They recommend that if the proposal will generate an increase of night-time traffic on Tunbridge Tier Road of more than 10%, roadkill mitigation measures should be implemented in accordance with the Tasmanian Devil Survey Guidelines and Management Advice for Development Proposals. PCAB had no further comments or issues regarding the quarry expansion proposal.</p>   |
| <b>Evaluation</b>   |
| <p>There are a number of threatened flora species and vegetation communities present within the mining lease that require on-going management consistent with the current management framework. The previous assessment and permit conditions resulted in the location, delineation and protection of three areas containing listed flora species. The quarry footprint is not proposed to change, therefore the focus of management should be maintaining the protection of the established preservation areas.</p> <p>As such <b>condition FF1</b> will be imposed to require the ongoing delineation and protection of the three areas shown in Figure 3 of the EAR. <b>Condition FF2</b> will be imposed, consistent with the previous conditions, to require the activity to be conducted in such a manner that degradation or disturbance of the</p>  |

threatened vegetation communities does not occur.

Conditions **E1**, **E2** and **E3** will also be imposed (see Issue 4 of the EAR) to ensure that any water discharged from the Land will not cause environmental harm or nuisance to the Saline Aquatic Herbland (listed under the NC Act) located to the western side of the mining lease.

The Ecological Assessment Report indicated that much of the habitat is not present within the quarry works area or is of marginal quality but impacts to threatened species are considered unlikely. While the proposal will increase the rate of extraction and therefore increase traffic movements during the campaigns, the increase in vehicle numbers was anticipated under the previous assessment. Operating hours under **condition N1** (see Issue 2 – Noise emissions) also limits the potential for traffic movements at night-time. Therefore, conditions in relation to threatened fauna, including roadkill mitigation measures, are not considered necessary.

The activity currently operates under a Weed Management Plan, but it has not been approved by the Director, EPA. The Weed Management Plan submitted as part of this application (Appendix 4 of the EER) has been reviewed and is considered appropriate for managing weed issues at the site and is to be approved as part of the determination of this assessment. The proponent will be required to comply with the approved management under **condition FF3**.

### Conclusion

The proponent will be required to comply with the following conditions:

- FF1 Protection of threatened flora species**
- FF2 Protection of threatened vegetation communities**
- FF3 Weed Management Plan**
- N1 Operating hours**
- E1 Perimeter drains or bunds**
- E2 Stormwater**
- E3 Design and maintenance of settling ponds**

|   |
|---|
| <b>Issue 2: Noise Emissions</b>   |
| <b>Description of potential impacts</b>   |
| <p>The quarry upgrade will be operated on a campaign style basis. The EER states that during a campaign various items of mobile equipment will be used on site for a range of operations (see Section 3 for a complete list). Once each machine has completed its task, and is not required for subsequent operations, it will be demobilised.</p> <p>Noise emissions during campaigns, which have the potential to cause environmental nuisance if not appropriately managed, will result from the use of:</p> <ul style="list-style-type: none"> <li>• The drill rig and blasting;</li> <li>• The crusher / screener plant; and</li> <li>• On-site mobile ancillary equipment (e.g. excavator, loader, trucks and other vehicles).</li> </ul> <p>The quarry is located on an exposed ridgeline approximately 4km northwest of the township of Tunbridge on a low hummock in a landscape with generally low relief. According to the EER, the proposed quarry faces will be situated so that they are orientated to the west (see Figures 2 and 3) with the southern portion of the ridgeline being retained. It notes that retaining this southern ridgeline, along with the low overburden windrows placed above it, will create a substantial topographic barrier to attenuate noise at receptors located to the south and east of the site.</p> <p>Quarry development will initially proceed east and later to the north from the existing pit (see Figures 2 and 3 for the stages of expansions). Ultimately, it is proposed to develop three faces approximately 12m high (with a catch area of 5m) and up to 270m wide.</p> <p>The nearest sensitive receptor is located approximately 2.2km south of the site (Figure 1).</p> <p>According to the EER blasting will be conducted by a fully qualified and experienced blasting contractor that will employ techniques to minimise air blast overpressure, ground vibration and fly rock impacts as detailed in the Blast Management Plan contained in Appendix 5 of the EER.</p> |
| <b>Management measures proposed in EER</b>  |
| <p>The following management measures were proposed in the EER:</p> <ul style="list-style-type: none"> <li>• EER Commitment 7 – <i>The quarry development plan will retain the existing ridgeline on the south side to attenuate noise for receptors to the south; and</i></li> <li>• EER Commitment 8 – <i>Blasting will be conducted in accordance with a documented Blast Management Plan.</i></li> </ul> <p>Techniques to be employed to control blasting impacts as detailed in the <i>Blast Management Plan for HBMI Tunbridge Quarry</i> (see Appendix 5 of the EER), include:</p> <ul style="list-style-type: none"> <li>• Air Overpressure: stemming height and software generated blast design.</li> <li>• Vibration: minimising instantaneous charge (MIC) and software generated blast design.</li> <li>• Fly Rock: Stemming height, blast design and exclusion zones.</li> <li>• Traffic Management: Fully trained and qualified Blast Guards to control traffic on Tunbridge Tier Road.</li> <li>• Machinery and Equipment: Fully qualified shot firer will advise on safe placement of equipment and machinery.</li> </ul>  |
| <b>Public and agency comment</b>  |
| <p>EPA Tasmania's Noise Specialist commented that given the modest size of the quarry and the significant distance to the nearest neighbour, there is no need for noise or vibration limits. He recommended appropriate traffic control during blasting.</p>  |



### Evaluation

The nearest sensitive use (a rural residence) is located approximately 2.2km south of the proposed quarry site and lies outside the standard recommended attenuation distances for crushing/screening (750m) and blasting (1,000m) as recommended in the *Quarry Code of Practice 2017*.

The orientation of the quarry faces to the west and north, and the retention of the southern ridgeline of the hummock means that there is no clear line of sight between the quarry floor working area and the residences to the south and east, which will assist in attenuating noise emissions from the quarry activities.

The EER states that quarry development will be operated in accordance with the *Quarry Code of Practice 2017* (QCoP), including the hours of operation, which are proposed as 0700 to 1900hrs Monday to Friday, 0800 to 1600hrs on Saturdays with no operations occurring on Sundays and public holidays. These hours are defined in **condition N1**. In addition, the QCoP has been referenced in the Information section. The QCoP details expected standards of noise management.

The orientation of the quarry faces and the blast design outlined in the Blast Management Plan (refer to Appendix 5 of the EER) will help reduce the impacts from blasting towards the south and east. Blasting hours will be restricted in **condition B1** from 1000 to 1600hrs Monday to Friday with no blasting to occur on Saturdays, Sundays or public holidays without the written approval of the Director, EPA.

Environmental nuisance arising from quarry noise as a result of an increase in production is considered unlikely. The conditions detailed below will help ensure that noise emissions are appropriately managed.

Given the distance to the nearest sensitive receptor (2.2km south of the site) and the topography of the site, noise and/or vibration from drilling and blasting is considered unlikely to cause a significant impact. The Blast Management Plan indicates that ground vibration will be monitored to ascertain and record vibration levels, which is supported. No specific blast monitoring or reporting condition has been included, as it is not considered necessary given the distance to the nearest sensitive receptor and the topography.

The Noise Specialist has indicated noise and vibration limits are not required. However due to the increase in blasting events and the need to manage emissions and impacts associated with these events, **condition B2** will be imposed to require compliance with the current Blast Management Plan. This Plan was approved as part of the previous assessment. This is consistent with commitment 8 of the EER. The Blast Management Plan indicates that a risk assessment will be undertaken (in relation to fly rock) prior to blasting to determine whether Interlaken Road (aka Tunbridge Tier Road) necessitates closure during the blast. Traffic control detailed in the BMP is consistent with the recommendations of the Noise Specialist.

It is also considered appropriate to require the proponent to maintain a complaints register through condition **G6**.

Noise emissions from trucks travelling to and from the site along Tunbridge Tier Road are considered unlikely to cause environmental nuisance due to the absence of residences until the township of Tunbridge itself, which has the Midland Highway in the vicinity and already carries a significant heavy vehicle load with considerable noise impacts. No conditions related to traffic movements are considered necessary.

### Conclusion

The proponent will be required to comply with the following conditions:

- N1**     **Operating hours**
- B1**     **Blasting times**
- B2**     **Blast Management Plan**
- G6**     **Complaints register**

|   |
|---|
| <b>Issue 3: Air emissions</b>   |
| <b>Description of potential impacts</b>   |
| <p>There is potential to generate dust during drilling and blasting, pushing and loading of stockpiles, from stockpiles / windrows, screening and crushing, loading of trucks and carting of material on and off-site. These can cause environmental nuisance, particularly to sensitive receptors if not appropriately managed.</p> <p>The nearest building is located approximately 1.2km south of the proposed quarry, with the nearest residence 2.2 km to the southwest of the quarry. The predominant wind direction is from the north.</p> <p>The maximum disturbed area at any one time for the quarry will be 6ha.</p> <p>Use of machinery and vehicles will consume fossil fuels and cause greenhouse gas emissions.</p>  |
| <b>Management measures proposed in EER</b>  |
| <ul style="list-style-type: none"> <li>• <i>Strategies will be employed to minimise the impact of dust emissions (Commitment 6).</i></li> <li>• <i>Blasting will be conducted in accordance with a documented Blast Management Plan (Commitment 8).</i></li> </ul> <p>The EER lists the following strategies to minimise dust emissions:</p> <ul style="list-style-type: none"> <li>• Dust from drilling will be picked up by the drilling machine.</li> <li>• Pushing will occur at low speeds and drop distances when loading hoppers and dropping to stockpiles will be kept small.</li> <li>• Stockpiles and windrows will be kept below 2m in height and vegetation will be encouraged to protect the surfaces from wind erosion.</li> <li>• The crusher / screener plant will be brought to the site for each campaign, if dust emissions become an issue, temporary water jets will be used to wet down the product on conveyors.</li> <li>• Drop distances will also be kept low when loading trucks. Where loads protrude above the sides of the trays, covers or wetting will be used.</li> <li>• A speed limit of 25km/hr will be applied to all vehicles within the proposed quarry site and access road.</li> </ul> <p>The EER notes that the quarry upgrade will result in a net reduction in diesel fuel consumption and hence greenhouse gas emission (Section 14 of the EER). This is based on the assumption that materials for maintenance / upgrade works on the Midland Highway are currently sourced from quarries located in the north and south of the state and hence that by using materials from the proposed Tunbridge Tier Quarry transport distances will be reduced.</p> |
| <b>Public and agency comment</b>  |
| No comments were received.  |
| <b>Evaluation</b>   |
| <p>Given the distance to the nearest residences compliance with commitments 6 and 8 are likely to be sufficient to ensure that dust emissions from internal roads, material handling / haulage, blasting and exposed areas do not cause nuisance. The implementation of commitment 6 is required under <b>A1</b> and <b>A2</b>. The implementation of commitment 8 is required through the blasting conditions outlined in Issue 2 – noise emissions.</p> <p>It is noted that all residences are located outside the recommended separation distance for crushing / screening and blasting (<i>Quarry Code of Practice 2017</i>).</p>   |

**Conclusion**

The proponent will be required to comply with the following conditions:

**A1 Covering of vehicles**

**A2 Control of dust emissions**

The person responsible also has a general environmental duty to conduct the activity in accordance with the *Quarry Code of Practice 2017* as detailed under Information section (O13).

|   |
|---|
| <b>Issue 4: Stormwater and sediment management</b>  |
| <b>Description of potential impacts</b>   |
| <p>Inappropriate mitigation and management of stormwater has the potential to cause environmental impacts to land and water. According to the EER, a water course runs approximately 50 metres to the west of the mining lease boundary and is a tributary to the Blackman River (Figure 5).</p> <p>According to the EER, as part of the previous proposal, infrastructure has been installed to ensure that runoff from all future activities on the site is collected in a sediment retention basin that will provide sufficient detention time to allow sediment to settle out. The sediment retention infrastructure has capacity to retain sediment in flows of up to a 1 in 20-year reoccurrence interval storm.</p> <p>Since the previous proposal was approved, the Proponent has also identified a need for a secondary sediment retention trap, which will be installed to capture runoff from the haul road and current processing site. The catchment for the quarry sediment retention basin is an unpaved gravel surface including the faces, benches and floor of the ultimate quarry footprint.</p>   |
| <b>Management measures proposed in EER</b>  |
| Commitment 5: <i>All existing stormwater and sediment control infrastructure will be maintained.</i>  |
| <b>Public and agency comment</b>  |
| Regulator comment: I am satisfied with the proposed standard measures to control storm water and runoff.  |
| <b>Evaluation</b>   |
| <p>The total area of land able to be disturbed will remain at 6 ha. The maintenance of current stormwater control infrastructure (i.e. intercept drains, culvert and sediment retention basin) is considered sufficient to manage stormwater on the site. To ensure this infrastructure continues to be installed and maintained as the quarry develops, the proponent will be required to comply with <b>conditions E1 and E3</b>. Condition E1 requires the construction of permitter drains or bunds and E3 requires the design and maintenance of settling ponds. Maintenance of the settling ponds under E3 will ensure mitigation of sediment loss during a 1 in 20-year event.</p> <p><b>Condition E2</b> is also imposed to ensure appropriate management of stormwater from all sources to ensure that solids entrained in stormwater are retained on the Land.</p> <p><b>Condition DC2</b> requires progressive rehabilitation in accordance with the QCoP and restricts the amount of land that may be un-rehabilitated at any one time. While the area specified within <b>condition DC3</b> (6 ha) will result in little or no progressive rehabilitation being undertaken, it is considered that the potential erosion conditions specified above will be sufficient to manage the potential risks associated with having 6 ha disturbed at any one time.</p> |
| <b>Conclusion</b>   |
| <p>The proponent will be required to comply with the following conditions:</p> <p><b>E1 Perimeter drains or bunds</b></p> <p><b>E2 Stormwater</b></p> <p><b>E3 Design and maintenance of settling ponds</b></p> <p><b>DC2 Progressive rehabilitation</b></p>  |

| <b>Issue 5: Waste management and environmentally hazardous substances</b>  |
|--|
| <b>Description of potential impacts</b>  |
| <p>Inappropriate management of waste and environmentally hazardous materials has the potential to cause environmental impacts to land and water. According to the EER, all equipment and infrastructure will be cleared from the site at the end of each campaign. Wastes generated at the site will be minimal (including wastes from machinery repairs and routine maintenance and lunch items).</p> <p>Mobile equipment will require a small quantity of lubricating fluids and refuelling on a daily basis during campaigns. These materials will be stored and transported in utilities. Spills may occur when machinery is being refuelled or serviced and could potentially pollute soils and waterways.</p> <p>Professional blasting contractors will be used when undertaking blasting, the contractor will be appropriately licenced to handle, store and transport explosives. No explosives will be stored at the site.</p>  |
| <b>Management measures proposed in EER</b>   |
| <p>Litter arising from lunches and routine servicing of equipment will be removed at the end of each working day.</p> <p><i>A hydrocarbon spill kit will be made available on site for immediate deployment during each extractive campaign (Commitment 10).</i></p>   |
| <b>Public and agency comment</b>   |
| None.  |
| <b>Evaluation</b>  |
| <p>No specific management commitments were made in relation to waste management at the site, however it appears that minimal wastes will be produced from the activity and any wastes that are produced will be removed on a daily basis or at the end of each campaign (in the case of machine repair wastes).</p> <p>Given the nature of the activity and wastes generated, specific conditions in regard to waste management are not considered necessary. <b>O11</b> outlines the appropriate manner in which to manage wastes (i.e. reduce wastes or re-use/recycle wastes where possible).</p> <p>To ensure fuel, lubricating fluids and any other environmentally hazardous materials are stored and handled appropriately when on-site, <b>condition H2</b> is included in the permit. Commitment 10, to have a spill kit on-site during campaigns is considered appropriate and is required by <b>condition H1</b>.</p> <p>As mobile equipment will be used for refuelling, <b>condition H3</b> has also been imposed to manage the handling of environmentally hazardous materials during this activity.</p> <p><b>LO2</b> is included in the permit, which provides information on the proponent's responsibilities under other relevant legislation.</p> |
| <b>Conclusion</b>  |
| <p>The following information is included in the permit:</p> <p><b>O11 Waste management hierarchy</b></p> <p><b>O13 Quarry Code of Practice</b></p> <p>The proponent will be required to comply with the following conditions:</p> <p><b>H1 Spill kits</b></p> <p><b>H2 Storage and handling of hazardous materials</b></p> <p><b>H3 Handling of hazardous materials - mobile</b></p> <p>The following legal information is included in the permit:</p> <p><b>LO2 Storage and handling of Dangerous Goods, Explosives and dangerous substances</b></p>  |

| Issue 6: Decommissioning and Rehabilitation  |
|--|
| <b>Description of potential impacts</b>  |
| <p>In the event that the activity ceased, appropriate decommissioning and rehabilitation would be required to ensure no long-term environmental impacts. The EER states progressive rehabilitation techniques will be applied to maintain a maximum disturbed area of 6.0 hectares. As extractive areas become 'worked out' these will be progressively rehabilitated to gradually reduce the total area of disturbance. The previous approval resulted in most of the clearance required for the life of the quarry, with topsoil retained for rehabilitation.</p>  |
| <b>Management measures proposed in EER</b>   |
| <ul style="list-style-type: none"> <li>• <i>If natural recruitment has not provided adequate cover after 12 months direct seeding will be applied to supplement revegetation (Commitment 12).</i></li> <li>• <i>The Operator will continue to maintain the rehabilitated area until a self-sustaining vegetation community is achieved (Commitment 13).</i></li> </ul> <p>Natural regeneration will be used where possible (i.e. from existing material in the windrowed top soil), if after 12 months regeneration is not sufficient, direct seeding will occur.</p> <p>Sediment control infrastructure (drains, culverts and sediment retention basin – see issue 4) will be monitored until such time that the site has been decommissioned to prevent erosion of sediments.</p> <p>Final use of the site will be sheep grazing pasture.</p> <p>Section 17 of the EER outlines the principles and basic process for rehabilitating areas that are no longer being quarried or in active use and upon decommissioning of the site.</p> <p>Table 25 and 26 of the EER outline the proposed planting schedule for quarry bench rehabilitation, including canopy, mid-storey and understorey species.</p>   |
| <b>Public and agency comment</b>   |
| None   |
| <b>Evaluation</b>  |
| <p>The EER outlines the basic principal and process that is proposed for rehabilitation, including progressive and final rehabilitation measures. The rehabilitation measures outlined are broadly in line with those recommended by the QCoP.</p> <p>Where any additional surface soils will be removed <b>Condition DC1</b> will require the top soil to be stockpiled for the purpose of rehabilitation.</p> <p>The EER states that as extractive areas become worked out they will be progressively rehabilitated to reduce the total area of the site disturbed. This is supported by the inclusion of <b>condition DC2</b> requiring the proponent to carry out progressive rehabilitation in accordance with the relevant provision of the QCoP. This condition also specifies that the maximum area of land which may remain, at any time, without rehabilitation as 6ha.</p> <p>A basic list outlining the final rehabilitation process for the site is outlined in section 17 of the EER. The approach outlined by the proponent is supported. However, the absence of significant progressive rehabilitation over the life of the quarry and the large scale of the quarry warrants the imposition of a Decommissioning and Rehabilitation Plan to manage the rehabilitation at the cessation of the activity. This will be required under <b>Condition DC5</b>. Implementation of the DRP on cessation is required under condition <b>DC6</b>.</p> <p>The proponent is required to notify the Director, EPA of permanent cessation of the activity (<b>condition DC3</b>) or where a temporary suspension of activity (<b>condition DC4</b>) is likely to occur.</p> |
| <b>Conclusion</b>  |
| <p>The proponent will be required to comply with the following conditions:</p> <p><b>DC1 Stockpiling of surface soil</b></p>   |

- DC2 Progressive rehabilitation**
- DC3 Notification of cessation**
- DC4 Temporary suspension of activity**
- DC5 DRP Requirements**
- DC6 Rehabilitation following cessation**

The person responsible also has a general environmental duty to conduct the activity in accordance with the *Quarry Code of Practice 2017* as detailed under Information section (O13).

## 7 Report conclusions

This assessment has been based upon the information provided by the proponent in the EER and in correspondence and discussion between EPA Tasmania and the proponent and the proponent's representatives.

This assessment has incorporated specialist advice provided by EPA Tasmania scientific specialists and regulatory staff, other Divisions of DPIPWE and other government agencies.

It is concluded that:

1. the RMPS and EMPCS objectives have been duly and properly pursued in the assessment of the proposal; and
2. the assessment of the proposal has been undertaken in accordance with the Environmental Impact Assessment Principles.

It is concluded that the proposal is capable of being managed in an environmentally acceptable manner such that it is unlikely that the RMPS and EMPCS objectives would be compromised, provided that the Permit Conditions - Environmental No. 9830 appended to this report are imposed and duly complied with.

The environmental conditions appended to this report are a new set of operating conditions for the entire, intensified activity that will supersede the existing Permit Conditions - Environmental No. 9294.

## Report approval

**Environmental Assessment Report and conclusions, including permit conditions, adopted:**



Wes Ford  
**DIRECTOR, EPA TASMANIA**  
**Delegate for the Board of the Environment Protection Authority**

Date: 13-06-2018



## 8 References

Integrated Land Management & Planning (2018); *Upgrade Tunbridge Tier Quarry – Environmental Effects Report*; dated 19 April 2018 (the EER).

The Department of Primary Industries, Parks, Water and Environment (DPIPWE) (2015); *Weed and Disease Planning and Hygiene Guidelines - Preventing the spread of weeds and diseases in Tasmania*; dated March 2015 (the Washdown Guidelines).

## 9 Appendices

Appendix 1 Permit Conditions – Environmental No. 9830

**Appendix 1 Permit Conditions – Environmental No. 9830**

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**PERMIT PART B**  
**PERMIT CONDITIONS - ENVIRONMENTAL No. 9830**

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Issued under the *Environmental Management and Pollution Control Act 1994*

Activity: **The operation of a quarry (ACTIVITY TYPE: Crushing, grinding, milling or separating into different sizes (rocks, ores or minerals))**  
**TUNBRIDGE TIER QUARRY, TUNBRIDGE TIER ROAD**  
**TUNBRIDGE TAS 7120**

The above activity has been assessed as a level 2 activity under the *Environmental Management and Pollution Control Act 1994*.

Acting under Section 25(5)(a)(i) of the EMPCA, the Board of the Environment Protection Authority has required that this Permit Part B be included in any Permit granted under the *Land Use Planning and Approvals Act 1993* with respect to the above activity.

Municipality: **NORTHERN MIDLANDS**  
Permit Application Reference: **P18-047**  
EPA file reference: **254977**

Date conditions approved: 13 June 2018



Signed: \_\_\_\_\_

DELEGATE FOR THE BOARD OF THE ENVIRONMENT  
PROTECTION AUTHORITY

### DEFINITIONS

Unless the contrary appears, words and expressions used in this Permit Part B have the meaning given to them in **Schedule 1** of this Permit and in the EMPCA. If there is any inconsistency between a definition in the EMPCA and a definition in this Permit Part B, the EMPCA prevails to the extent of the inconsistency.

### ENVIRONMENTAL CONDITIONS

The person responsible for the activity must comply with the conditions contained in **Schedule 2** of this Permit Part B.

### INFORMATION

Attention is drawn to **Schedule 3**, which contains important additional information.

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## *Attachments*

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Attachment 2: Location of threatened flora preservation areas (modified: 18/05/2018 10:44)....1 page

### Schedule 1: Definitions

In this Permit Part B:-

**140,000 cubic metres per year** is considered to be equivalent to 224,000 tonnes per year.

**Aboriginal Relic** has the meaning described in section 2(3) of the *Aboriginal Heritage Act 1975*.

**Activity** means any environmentally relevant activity (as defined in Section 3 of EMPCA) to which this document relates, and includes more than one such activity.

**Authorized Officer** means an authorized officer under section 20 of EMPCA.

**Best Practice Environmental Management** or '**BPEM**' has the meaning described in Section 4 of EMPCA.

**Director** means the Director, Environment Protection Authority holding office under Section 18 of EMPCA and includes a person authorised in writing by the Director to exercise a power or function on the Director's behalf.

**DRP** means Decommissioning and Rehabilitation Plan.

**EMPCA** means the *Environmental Management and Pollution Control Act 1994*.

**Environmental Harm** and **Material Environmental Harm** and **Serious Environmental Harm** each have the meanings ascribed to them in Section 5 of EMPCA.

**Environmental Nuisance** and **Pollutant** each have the meanings ascribed to them in Section 3 of EMPCA.

**Environmentally Hazardous Material** means any substance or mixture of substances of a nature or held in quantities which present a reasonably foreseeable risk of causing serious or material environmental harm if released to the environment and includes fuels, oils, waste and chemicals but excludes sewage.

**Person Responsible** is any person who is or was responsible for the environmentally relevant activity to which this document relates and includes the officers, employees, contractors, joint venture partners and agents of that person, and includes a body corporate.

**Stormwater** means water traversing the surface of the land as a result of rainfall.

**The Land** means the land on which the activity to which this document relates may be carried out, and includes: buildings and other structures permanently fixed to the land, any part of the land covered with water, and any water covering the land. The Land falls within the area defined by Mining Lease 1502P/M on certificates of title 131849/1 and 170439/4 and as further delineated at Attachment 1.

**Schedule 2: Conditions****Maximum Quantities****Q1 Regulatory limits**

- 1 The activity must not exceed the following limits :
  - 1.1 140,000 cubic metres per year of rocks, ores or minerals processed.
  - 1.2 140,000 cubic metres per year of rock or gravel extracted

**General****G1 Access to and awareness of conditions and associated documents**

A copy of these conditions and any associated documents referred to in these conditions must be held in a location that is known to and accessible to the person responsible for the activity. The person responsible for the activity must ensure that all persons who are responsible for undertaking work on The Land, including contractors and sub-contractors, are familiar with these conditions to the extent relevant to their work.

**G2 Incident response**

If an incident causing or threatening environmental nuisance, serious environmental harm or material environmental harm from pollution occurs in the course of the activity, then the person responsible for the activity must immediately take all reasonable and practicable action to minimise any adverse environmental effects from the incident.

**G3 No changes without approval**

- 1 The following changes, if they may cause or increase the emission of a pollutant which may cause material or serious environmental harm or environmental nuisance, must only take place in relation to the activity if such changes have been approved in writing by the EPA Board following its assessment of an application for a permit under the *Land Use Planning and Approvals Act 1993*, or approved in writing by the Director:
  - 1.1 a change to a process used in the course of carrying out the activity; or
  - 1.2 the construction, installation, alteration or removal of any structure or equipment used in the course of carrying out the activity; or
  - 1.3 a change in the quantity or characteristics of materials used in the course of carrying out the activity.

**G4 Change of responsibility**

If the person responsible for the activity intends to cease to be responsible for the activity, that person must notify the Director in writing of the full particulars of any person succeeding him or her as the person responsible for the activity, before such cessation.

**G5 Change of ownership**

If the owner of The Land upon which the activity is carried out changes or is to change, then, as soon as reasonably practicable but no later than 30 days after becoming aware of the change or intended change in the ownership of The Land, the person responsible must notify the Director in writing of the change or intended change of ownership.



**G6 Complaints register**

- 1 A public complaints register must be maintained and made available for inspection by an Authorized Officer upon request. The public complaints register must, as a minimum, record the following detail in relation to each complaint received in which it is alleged that environmental harm (including an environmental nuisance) has been caused by the activity:
  - 1.1 the date and time at which the complaint was received;
  - 1.2 contact details for the complainant (where provided);
  - 1.3 the subject-matter of the complaint;
  - 1.4 any investigations undertaken with regard to the complaint; and
  - 1.5 the manner in which the complaint was resolved, including any mitigation measures implemented.
- 2 Complaint records must be maintained for a period of at least 3 years.

**Atmospheric****A1 Covering of vehicles**

Vehicles carrying loads containing material which may blow or spill must be equipped with effective control measures to prevent the escape of the materials from the vehicles when they leave The Land or travel on public roads. Effective control measures may include tarpaulins or load dampening.

**A2 Control of dust emissions**

Dust emissions from The Land must be controlled to the extent necessary to prevent environmental nuisance beyond the boundary of The Land.

**Blasting****B1 Blasting times**

Blasting on The Land must take place only between the hours of 1000 hours and 1600 hours Monday to Friday. Blasting must not take place on Saturdays, Sundays or public holidays unless prior written approval of the Director has been obtained.

**B2 Blast Management Plan**

Unless otherwise specified in these conditions, the activity must be undertaken in accordance with the approved Blast Management Plan dated 1 October 2015 written by Forze Explosive Services, as may be amended from time to time with written approval from the Director.

**Decommissioning And Rehabilitation****DC1 Stockpiling of surface soil**

Prior to commencement of extractive activities on any portion of The Land, surface soils must be removed in that portion of The Land to be disturbed by the conduct of the activity and stockpiled for later use in rehabilitation of The Land. Topsoil must be kept separate from other overburden and protected from erosion or other disturbance.

**DC2 Progressive rehabilitation**

Worked out or disused sections of The Land must be rehabilitated concurrently with extractive activities on other sections of The Land. Progressive rehabilitation must be carried out in accordance with the relevant provisions of the *Quarry Code of Practice*, unless otherwise approved in writing by the Director. The maximum disturbed area of land which may remain, at any time, without rehabilitation is 6 hectare.

**DC3 Notification of cessation**

Within 30 days of becoming aware of any event or decision which is likely to give rise to the permanent cessation of the activity, the person responsible for the activity must notify the Director in writing of that event or decision. The notice must specify the date upon which the activity is expected to cease or has ceased.

**DC4 Temporary suspension of activity**

- 1 Within 30 days of becoming aware of any event or decision which is likely to give rise to the temporary suspension of the activity, the person responsible for the activity must notify the Director in writing of that event or decision. The notice must specify the date upon which the activity is expected to suspend or has suspended.
- 2 During temporary suspension of the activity:
  - 2.1 The Land must be managed and monitored by the person responsible for the activity to ensure that emissions from The Land do not cause serious environmental harm, material environmental harm or environmental nuisance; and
  - 2.2 If required by the Director a Care and Maintenance Plan for the activity must be submitted, by a date specified in writing by the Director, for approval. The person responsible must implement the approved Care and Maintenance Plan, as may be amended from time to time with written approval of the Director.
- 3 Unless otherwise approved in writing by the Director, if the activity on The Land has substantially ceased for 2 years or more, rehabilitation of The Land must be carried out in accordance with the requirements of these conditions as if the activity has permanently ceased.

**DC5 DRP requirements**

Unless otherwise approved in writing by the Director, a Decommissioning and Rehabilitation Plan (DRP) for the activity must be submitted for approval to the Director within 30 days of the Director being notified of the planned cessation of the activity or by a date specified in writing by the Director. The DRP must be prepared in accordance with any guidelines provided by the Director.

**DC6 Rehabilitation following cessation**

- 1 Following permanent cessation of the activity, and unless otherwise approved in writing by the Director, The Land must be rehabilitated including:
  - 1.1 stabilisation of any land surfaces that may be subject to erosion;
  - 1.2 removal or mitigation of all environmental hazards or land contamination, that might pose an on-going risk of causing environmental harm; and
  - 1.3 decommissioning of any equipment that has not been removed.
- 2 Where a Decommissioning and Rehabilitation Plan (DRP) has been approved by the Director, decommissioning and rehabilitation must be carried out in accordance with that plan, as may be amended from time to time with written approval of the Director.

## **Effluent Disposal**

### **E1 Perimeter drains or bunds**

- 1 Perimeter cut-off drains, or bunds, must be constructed at strategic locations on The Land to prevent surface run-off from entering the area used or disturbed in carrying out the activity. All reasonable measures must be implemented to ensure that sediment transported along these drains, or bunds, remains on The Land. Such measures may include provision of strategically located sediment fences, appropriately sized and maintained sediment settling ponds, vegetated swales, detention basins and other measures designed and operated in accordance with the principles of Water Sensitive Urban Design.
- 2 Drains, or bunds, must have sufficient capacity to contain run-off that could reasonably be expected to arise during a 1 in 20 year rainfall event. Maintenance activities must be undertaken regularly to ensure that this capacity does not diminish.

### **E2 Stormwater**

- 1 Polluted stormwater that will be discharged from The Land must be collected and treated prior to discharge to the extent necessary to prevent serious or material environmental harm, or environmental nuisance.
- 2 Notwithstanding the above, all stormwater that is discharged from The Land must not carry pollutants such as sediment, oil and grease in quantities or concentrations that are likely to degrade the visual quality of any receiving waters outside The Land.
- 3 All reasonable measures must be implemented to ensure that solids entrained in stormwater are retained on The Land. Such measures may include appropriately sized and maintained sediment settling ponds or detention basins.

### **E3 Design and maintenance of settling ponds**

- 1 Sediment settling ponds must be designed and maintained in accordance with the following requirements:
  - 1.1 ponds must be designed to successfully mitigate reasonably foreseeable sediment loss which would result from a 1 in 20 year storm event;
  - 1.2 discharge from ponds must occur via a stable spillway that is not subject to erosion;
  - 1.3 all pond walls must be stable and treated with topsoil and vegetated or otherwise treated in such a manner as to prevent erosion; and
  - 1.4 sediment settling ponds must be periodically cleaned out to ensure that the pond design capacity is maintained. Sediment removed during this cleaning must be securely deposited such that sediment will not be transported off The Land by surface run-off.

## **Flora And Fauna**

### **FF1 Protection of threatened flora species**

- 1 The three threatened flora preservation areas as identified in Attachment 2, must be delineated with a fence or similar method from the date these conditions take effect.
- 2 Unless otherwise approved in writing by the Director:
  - 2.1 delineation of the three preservation areas, with a fence or similar method, must be maintained until rehabilitation of The Land is complete; and
  - 2.2 there must be no disturbance of the vegetation within these preservation areas; and

- 2.3 the activity must be conducted in a manner that does not cause degradation or disturbance (including sedimentation) to the preservation areas; and
- 2.4 the person responsible for the activity must ensure that all persons undertaking work on The Land, including contractors and sub-contractors, are aware of the location of the preservation areas and the requirements to protect them from disturbance.

**FF2 Protection of threatened vegetation communities**

Unless otherwise approved in writing by the Director, the activity must be conducted in a manner that does not cause degradation or disturbance (including sedimentation) to the threatened vegetation communities *Eucalyptus amygdalina* inland forest and woodland on Cainozoic deposits and Lowland Native Grassland of Tasmania.

**FF3 Weed Management Plan**

Unless otherwise specified in these conditions, the activity must be undertaken in accordance with the approved Weed Management Plan 19 April 2018 prepared by Hazell Bros Group Pty Ltd, as may be amended from time to time with written approval from the Director.

**Hazardous Substances**

**H1 Spill kits**

Spill kits appropriate for the types and volumes of materials handled on The Land must be kept in appropriate locations to assist with the containment of spilt environmentally hazardous materials.

**H2 Storage and handling of hazardous materials**

- 1 Unless otherwise approved in writing by the Director, environmentally hazardous materials held on The Land must be:
  - 1.1 stored within impervious bunded areas, spill trays or other containment systems; and
  - 1.2 managed to prevent unauthorised discharge, emission or deposition of pollutants:
    - 1.2.1 to soils within the boundary of The Land in a manner that is likely to cause serious or material environmental harm;
    - 1.2.2 to groundwater;
    - 1.2.3 to waterways; or
    - 1.2.4 beyond the boundary of The Land.

**H3 Handling of hazardous materials - mobile**

- 1 Where mobile containment of environmentally hazardous materials is utilised for the fuelling or servicing of mobile or fixed plant on The Land, all reasonable measures must be implemented to prevent unauthorised discharge, emission or deposition of pollutants:
  - 1.1 to soils within the boundary of The Land in a manner that is likely to cause serious or material environmental harm;
  - 1.2 to groundwater;
  - 1.3 to waterways; or
  - 1.4 beyond the boundary of The Land.
- 2 Reasonable measures may include spill kits, spill trays/bunds or absorbent pads, and automatic cut-offs on any pumping equipment.

**Noise Control****N1 Operating hours**

- 1 Unless otherwise approved by the Director, activities associated with the extraction of rock, gravel, sand, clay or minerals, and loading of product, and screening/crushing must not be undertaken outside the hours of 0700 hours to 1900 hours on weekdays and 0800 hours to 1600 hours on Saturdays.
- 2 Notwithstanding the above paragraph, activities must not be carried out on public holidays that are observed Statewide (Easter Tuesday excepted).

### Schedule 3: Information

#### Legal Obligations

##### **LO1 EMPCA**

The activity must be conducted in accordance with the requirements of the *Environmental Management and Pollution Control Act 1994* and Regulations thereunder. The conditions of this document must not be construed as an exemption from any of those requirements.

##### **LO2 Storage and handling of dangerous goods, explosives and dangerous substances**

- 1 The storage, handling and transport of dangerous goods, explosives and dangerous substances must comply with the requirements of relevant State Acts and any regulations thereunder, including:
  - 1.1 *Work Health and Safety Act 2012* and subordinate regulations;
  - 1.2 *Explosives Act 2012* and subordinate regulations; and
  - 1.3 *Dangerous Goods (Road and Rail Transport) Act 2010* and subordinate regulations.

##### **LO3 Aboriginal relics requirements**

- 1 The *Aboriginal Heritage Act 1975*, provides legislative protection to Aboriginal heritage sites in Tasmania regardless of site type, condition, size or land tenure. Section 14(1) of the Act states that; Except as otherwise provided in this Act, no person shall, otherwise than in accordance with the terms of a permit granted by the Minister on the recommendation of the Director of National Parks and Wildlife:
  - 1.1 destroy, damage, deface, conceal or otherwise interfere with a relic;
  - 1.2 make a copy or replica of a carving or engraving that is a relic by rubbing, tracing, casting or other means that involve direct contact with the carving or engraving;
  - 1.3 remove a relic from the place where it is found or abandoned;
  - 1.4 sell or offer or expose for sale, exchange, or otherwise dispose of a relic or any other object that so nearly resembles a relic as to be likely to deceive or be capable of being mistaken for a relic;
  - 1.5 take a relic, or permit a relic to be taken, out of this State; or
  - 1.6 cause an excavation to be made or any other work to be carried out on Crown land for the purpose of searching for a relic.
- 2 If a relic is suspected and/or identified during works then works must cease immediately and the Tasmanian Aboriginal Land and Sea Council and the Aboriginal Heritage Tasmania be contacted for advice before work can continue. In the event that damage to an Aboriginal heritage site is unavoidable a permit under section 14 of the *Aboriginal Heritage Act 1975* must be applied for. The Minister may refuse an application for a permit, where the characteristics of the relics are considered to warrant their preservation.
- 3 Anyone finding an Aboriginal relic is required under section 10 of the Act to report that finding as soon as practicable to the Director of National Parks and Wildlife or an authorized officer under the *Aboriginal Heritage Act 1975*. It is sufficient to report the finding of a relic to Aboriginal Heritage Tasmania to fulfil the requirements of section 10 of the Act.

**Other Information****OI1 Waste management hierarchy**

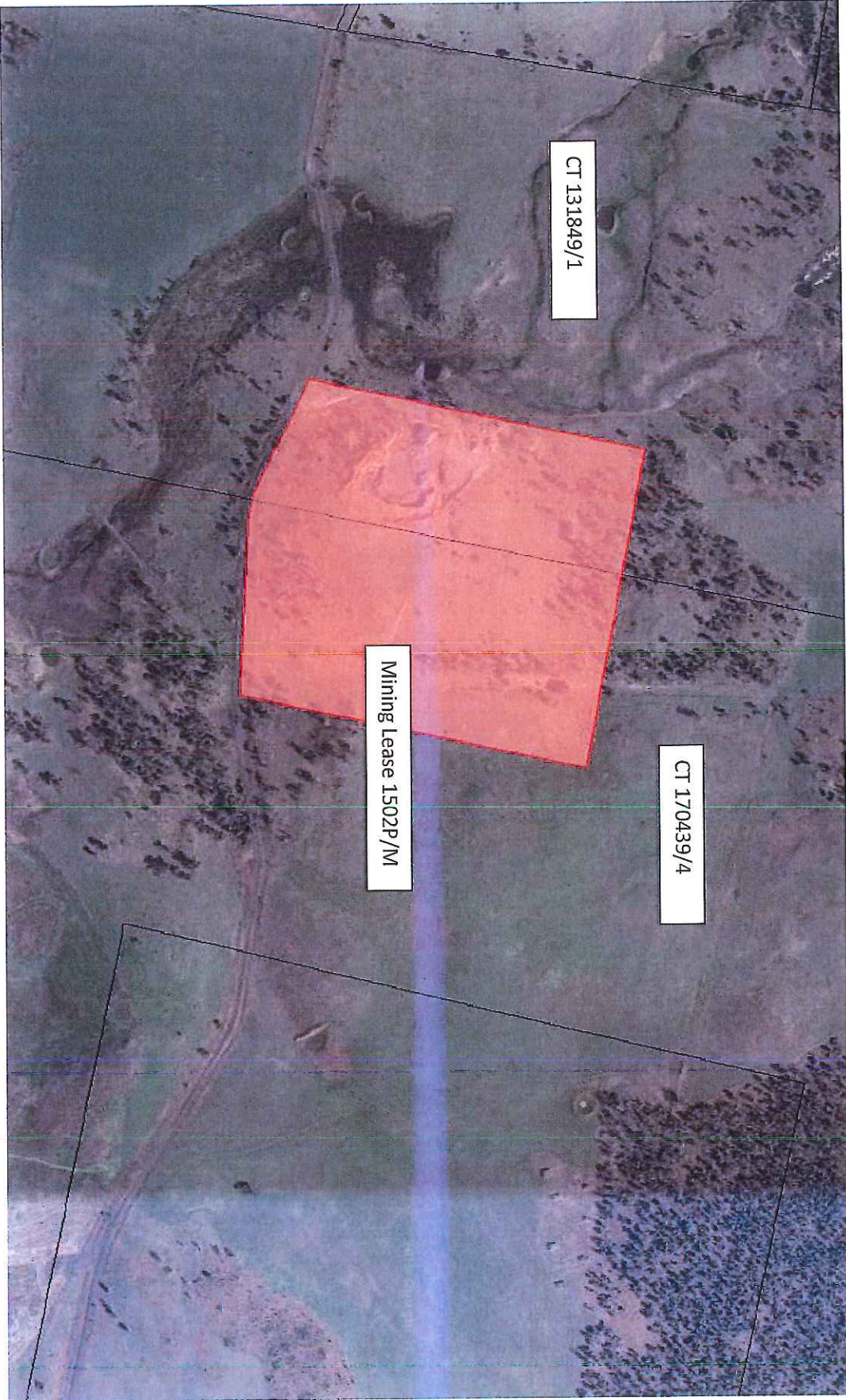
- 1 Wastes should be managed in accordance with the following hierarchy of waste management:
  - 1.1 waste should be minimised, that is, the generation of waste must be reduced to the maximum extent that is reasonable and practicable, having regard to best practice environmental management;
  - 1.2 waste should be re-used or recycled to the maximum extent that is practicable; and
  - 1.3 waste that cannot be re-used or recycled must be disposed of at a waste depot site or treatment facility that has been approved in writing by the relevant planning authority or the Director to receive such waste, or otherwise in a manner approved in writing by the Director.

**OI2 Notification of incidents under section 32 of EMPCA**

Where a person is required by section 32 of EMPCA to notify the Director of the release of a pollutant, the Director can be notified by telephoning 1800 005 171 (a 24-hour emergency telephone number).

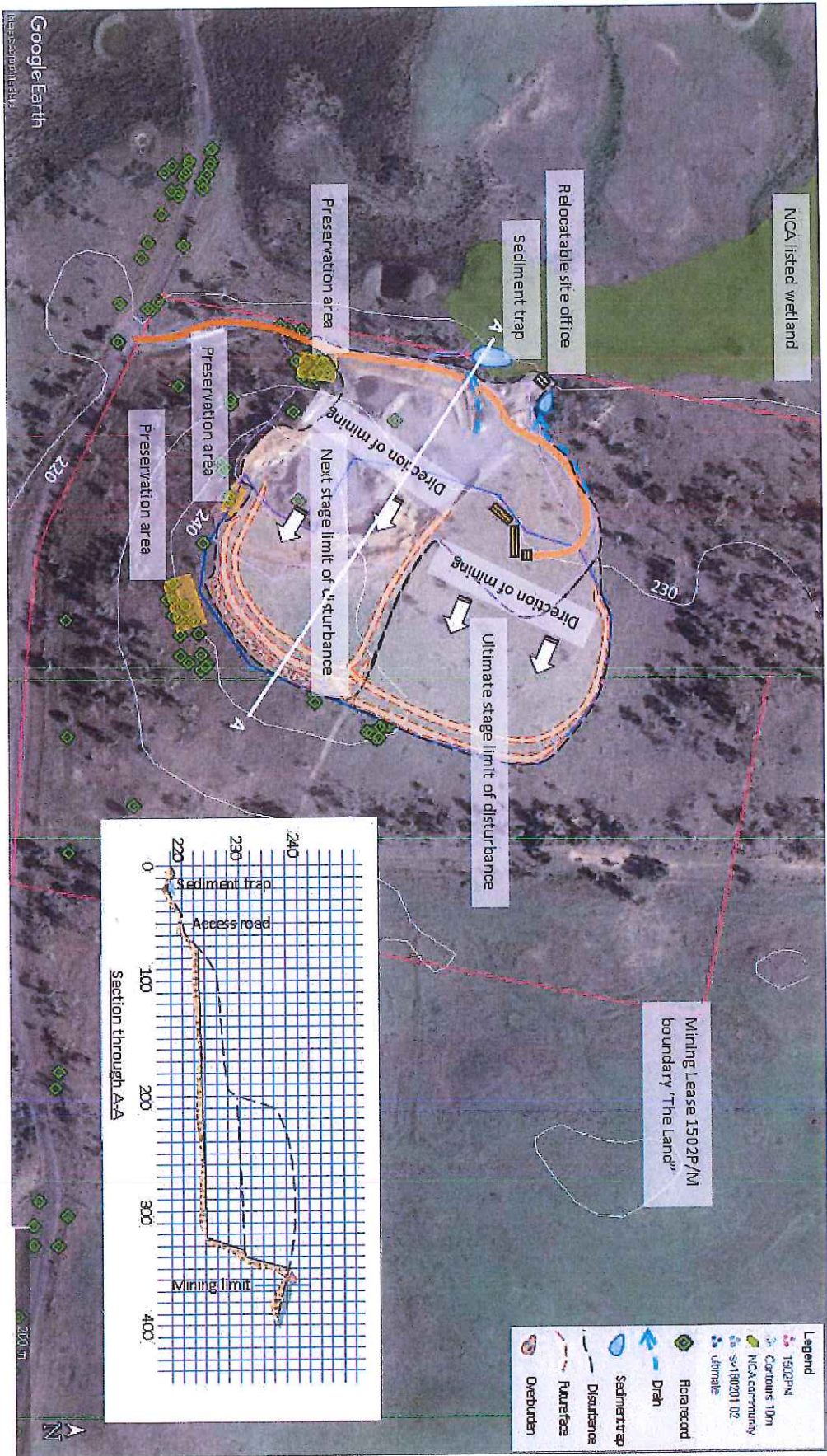
**OI3 Quarry Code of Practice**

The person responsible for the activity has a general environmental duty to conduct the activity in accordance with the *Quarry Code of Practice dated 2017* or any subsequent version.



Attachment 1: The Land





Attachment 2: Location of threatened flora preservation areas

REFERRAL OF DEVELOPMENT APPLICATION P18-047 TO WORKS DEPARTMENT

**Property/Subdivision No:** 9402300.01  
**Date:** 21-Mar-2018  
**Applicant:** Hazel Bros Group Pty Ltd  
**Proposal:** Increase production rate  
**Location:** Tunbridge Tier Road, TUNBRIDGE

W&I referral P18-047, Tunbridge Tier Road, TUNBRIDGE

**Jonathan - if you require further information, advise planning section as soon as possible – there are only 14 days from receipt of Permitted applications and 21 days from receipt of Discretionary applications to stop the clock.**

W.1 Access (Rural)

- a) Prior to the increase in production the access is to be upgraded in accordance with recommendations of Traffic Impact Assessment by Terry Eaton.
- b) Prior to the increase in production advisory signage is to be installed by the applicant in accordance with recommendations of Traffic Impact Assessment by Terry Eaton.

W.2 Road damage bond

- c) A road damage bond is to be applied based on the same methodology as used for calculating the bond on Valleyfield road quarry.

*Jonathan Galbraith (Works Officer)*

*Date: 5/7/18*