# Long Hill Quarry – Upgrade

Development Proposal and Environmental Management Plan

Prepared By: Barry Williams

Date: 3 February 2016

<table>
<thead>
<tr>
<th>Issue</th>
<th>Date</th>
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<tr>
<td>Draft 1</td>
<td>19 November 2015</td>
<td>Mr John Sherburn</td>
<td>Hazell Bros. Group Pty Ltd</td>
</tr>
<tr>
<td>Draft 2</td>
<td>15 December 2015</td>
<td>Mr Malcolm Budd</td>
<td>Environment Protection Authority</td>
</tr>
<tr>
<td>Final</td>
<td>1 Feb 2016</td>
<td>Mr Peter Bennett</td>
<td>Hazell Bros. Group Pty Ltd</td>
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<tr>
<td>Final</td>
<td>3 Feb 2016</td>
<td>Mr Adam Friend</td>
<td>Environment Protection Authority</td>
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1 INTRODUCTION

TABLE 1: PROJECT TITLE

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<thead>
<tr>
<th>Name</th>
<th>Long Hill Quarry - Upgrade</th>
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<tr>
<td>Address</td>
<td>Bass Highway, Elizabeth Town</td>
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TABLE 2: PROPOONENT DETAILS

<table>
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<tr>
<th>Business</th>
<th>Hazell Bros. Group Pty Ltd</th>
</tr>
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<tbody>
<tr>
<td>ACN</td>
<td>088 345 804</td>
</tr>
<tr>
<td>Address</td>
<td>PO Box 430</td>
</tr>
<tr>
<td></td>
<td>MOONAH Tasmania 7009</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:info@hazellbros.com.au">info@hazellbros.com.au</a></td>
</tr>
<tr>
<td>Phone</td>
<td>(03) 6278 888</td>
</tr>
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TABLE 3: CONTACT DETAILS

<table>
<thead>
<tr>
<th>Contact</th>
<th>Mr John Sherburd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile</td>
<td>0418 120 914</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:John.sherburd@hazellbros.com.au">John.sherburd@hazellbros.com.au</a></td>
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TABLE 4: OPERATOR DETAILS

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</tr>
</thead>
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<tr>
<td>ACN</td>
<td>009 509 148</td>
</tr>
<tr>
<td>Address</td>
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<td>Email</td>
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1.1 BACKGROUND

1.1.1 PROPONENT
Hazell Bros. Group Pty Ltd operates several quarries through various subsidiary companies. Operating 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

1.1.2 PROPOSAL
A Mining Lease (7M/2009) was granted in July 2009 to Hazell Bros. Group Pty Ltd to commercialise an under-utilised Forestry Tasmania quarry at Long Hill near Elizabeth Town in the State’s north.

An application to operate a Level 2 Activity, Medium Impact Quarry was approved by the Meander Valley Council with conditions on the 5th of May 2010. The Planning Permit issued (PA\09\0284) had conditions applied by the Board of the Environment Protection Authority “Permit Part B – Permit Conditions Environmental No. 7859. Conditions imposed on the permit restricted the maximum quantity of material produced at the quarry to 100 000 cubic metres per annum.

The original Long Hill Quarry operation was envisaged to be a campaign style operation using mobile equipment. The quarry developed since establishment as the demand for the product expanded and the market now justifies establishing a fixed plant quarry.

The Long Hill Quarry is targeting a Jurassic dolerite resource producing a clean ‘blue metal’ type aggregate that is used for concrete manufacture. Quarries targeting igneous source rock are quite rare in the north west of Tasmania and dolerite quarries are scarcer still. This quarry will produce products quite different from most other operations in the vicinity.

1.1.3 ENVIRONMENTAL LEGISLATION, REGULATIONS, CODES AND POLICIES
Legislation, regulations, policies and guidelines that are relevant to the review include the following:

- *Environmental Management and Pollution Control Act 1994 (and associated policies and regulations regarding water pollution, noise, etc)*;
- *Land Use Planning and Approvals Act 1993*;
- *Water Management Act 1999*;
- *State Policy on Water Quality Management 1997*;
- *Environment Protection Policy (Air Quality) 2004*;
- *Environment Protection Policy (Noise) 2009*;
- *The DPIWE Quarry Code of Practice, 1999*.
2 PROPOSAL DESCRIPTION

Much of the Long Hill Quarry’s demand for aggregates comes from concrete batch plants operated by Hazell Bros Group Pty Ltd. This demand will outstrip the maximum production capacity of the Long Hill Quarry within 12 months.

2.1 GENERAL

The Long Hill Quarry production line will consist of a unified extraction, processing and stockpiling operation and a sales and cartage operation. Both operations will continue in a similar manner to the existing operation.

The fixed plant has received a recent upgrade that incorporates more equipment energised by electrical power. A new electrical connection has been installed to facilitate this change.

**TABLE 5: FIXED EQUIPMENT DETAILS**

<table>
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<tr>
<th>Item</th>
<th>Description</th>
<th>Power consumption (kW)</th>
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<tr>
<td>1</td>
<td>Primary and secondary crusher circuit</td>
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**TABLE 6: MOBILE EQUIPMENT DETAILS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Make / model</th>
<th>Description</th>
<th>Power rating (kW)</th>
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<tr>
<td>1</td>
<td>Sandvik Tamrock 700</td>
<td></td>
<td>33</td>
</tr>
<tr>
<td>2</td>
<td>Hiundai 770 wheel loader</td>
<td></td>
<td>207</td>
</tr>
<tr>
<td>3</td>
<td>Komatsu HD325 dump truck</td>
<td></td>
<td>371</td>
</tr>
<tr>
<td>4</td>
<td>Excavator 50t (c/- breaker)</td>
<td></td>
<td>270</td>
</tr>
<tr>
<td>5</td>
<td>Komatsu WA430 wheel loader</td>
<td></td>
<td>173</td>
</tr>
<tr>
<td>6</td>
<td>Mechanical screener</td>
<td></td>
<td>328</td>
</tr>
</tbody>
</table>

The major change that is associated with this proposal will be an increase in the maximum rate of production from 100 000 cubic metres (m$^3$) to 200 000 m$^3$. The increase in production will require the extractive operation to move to a new area and the existing pit to be retired.

It is intended to rehabilitate the existing pit into a water storage reservoir that will be used by the plant. This change will alleviate the need to purchase water from an adjacent landowner.
The resource potential of the Long Hill Quarry site is expansive. The new area of extraction has a maximum elevation of 340 metres. There is minimal overburden with solid source rock outcropping in places. The prospective area is divided into two stages although it is likely that work will commence on the stage 4 area before the entire area of stage 3 is worked out. For the purpose of calculation the insitu (solid) density of dolerite is assumed to be 2.9 tonnes per cubic metre (t/m³) and the average bulk density of the product post processing is 1.6 t/m³. The resource potential with extraction to an elevation of 300 metres is estimated below:

### TABLE 8: RESOURCE POTENTIAL ESTIMATE

<table>
<thead>
<tr>
<th>Level (m AHD)</th>
<th>Stage 3 area (ha)</th>
<th>Volume (solid m³) 000’s</th>
<th>Mass (t) 000’s</th>
<th>Stage 4 area (ha)</th>
<th>Volume (solid m³) 000’s</th>
<th>Mass (t) 000’s</th>
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<tr>
<td>340</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>200</td>
<td>580</td>
</tr>
<tr>
<td>330</td>
<td>2</td>
<td>200</td>
<td>580</td>
<td>3</td>
<td>300</td>
<td>870</td>
</tr>
<tr>
<td>320</td>
<td>3.5</td>
<td>350</td>
<td>1 015</td>
<td>3.4</td>
<td>340</td>
<td>986</td>
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<tr>
<td>310</td>
<td>3.4</td>
<td>340</td>
<td>986</td>
<td>3.3</td>
<td>330</td>
<td>957</td>
</tr>
<tr>
<td>300</td>
<td>3.2</td>
<td>320</td>
<td>928</td>
<td>3.1</td>
<td>310</td>
<td>899</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>3 509</strong></td>
<td><strong>4 292</strong></td>
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</table>

The total resource potential of stages 3 and 4 extraction down to the 300 m level is 24 years at maximum production.

The majority of the production from the Long Hill Quarry will be carted off-site in on-road light combination trucks. These trucks have a conservative payload of 32 tonnes. The trucks will travel on the quarry access track to Dan Road and then to the intersection with the Bass Highway. A proportion of the trucks will turn left to travel towards Devonport and others will turn right to travel towards Elizabeth Town.

Using an average bulk density of 1.6 t/m³, at maximum annual production a total of 320 000 tonnes can be expected. The total off-site cartage will be 10 000 truckloads or 20 000 movements. This work will be undertaken over a period of 48 weeks which equates to 416 movements per week or just over 69 movements per day. There may be variations in the cartage task to service particular projects in which case it is possible for movements to increase to 100 per day.
On-Road Truck & Trailers

Water 5 ML/yr

Energy 6.8 MW/hr/yr

Diesel 247 kL/yr

Tamrock drill

50 t excavator / breaker

770 HT Wheel loader

HD 325 dump truck

Crushing circuit 220 t/hr

Internal Clients / asphalt plant

External Clients

Aggregates and Road Base

FIGURE 1: SCHEMATIC DOLERITE PIT AND PROCESSING
2.2 CONSTRUCTION

Two projects will facilitate the upgrade of the Long Hill Quarry; a new extraction area (Stage 3) will be prepared and the old pit will be rehabilitated to a water storage reservoir. Subsequently a third project will develop the stage 4 extraction area.

2.2.1 STAGE 3 EXTRACTION AREA

The stage 3 extraction area is located north west of the existing extractive pit. The commercial timber has been harvested from this area and entire area has been previously disturbed. In the intervening period between harvesting and the present regrowth shrubs and trees have colonised the open ground.

The stage 3 area (see Figure 2) will be cleared and grubbed with the stripping won used for rehabilitation works on the water storage site. Excess stripping and topsoil will be stockpiled. The first face will be exposed with a series of development shots starting from the north east corner of the stage 3 site and progressively advancing a face in a westerly direction.

2.2.2 WATER STORAGE RESERVOIR

Extraction activities until this point have concentrated on increasing the floor area of the existing pit. Once a satisfactory area of extraction has been exposed in stage 3, the existing pit will be closed and rehabilitation works commenced. The floor of the existing pit will become the water storage Reservoir. Rehabilitation materials will be applied to the banks and batters surrounding the future impoundment. With fresh stripping applied over only recently stripped topsoil it is likely that the banks and batters will revegetate from seed included in the stripping. The Reservoir will be allowed to fill naturally from run off.

The Proponent received confirmation from the Assessment Committee for Dam Construction the proposed reservoir does not constitute a dam for the purposes of the Water Management Act 1999 (Shackcloth, 2016).

2.3 COMMISSIONING

This proposal will use the existing recently upgraded process line equipment operating at a higher through-put to achieve the higher maximum production rate.

The only additional equipment that will be installed and commissioned as part of this proposal will be a pump station at the water supply reservoir. The pump station will lift water from the reservoir to the existing header tank located alongside the primary crusher chute.

2.4 GENERAL LOCATION MAP
FIGURE 2: LOCALITY PLAN SHOWING NEIGHBORING LAND USE

FIGURE 3: LOCALITY PLAN SHOWING LAND USE ZONES (MVCIPS13)
2.5 **Off-site Infrastructure**

The Long Hill Quarry uses electrical energy from the Aurora grid to energise the mechanical equipment powering the crushers and vibrating screens. The overall energy requirements are within the capacity of Aurora’s existing supply infrastructure.

The Long Hill Quarry requires access to the national and state road network to deliver the quarry products to market. The quarry traffic uses the quarry access road and then Dan Road, which is owned by Forestry Tasmania but maintained under agreement by the Proponent and then the Bass Highway which is a Category 1 National / State Highway.

3 **Project Alternatives**

Long Hill Quarry exceeded expectations in market development. It was envisaged that the maximum annual production rate would be more than adequate to service the market for the dolerite derived products in the north of Tasmania. However it is apparent capacity to supply to the potential market place is restricted by the production limits imposed by the permit for Long Hill Quarry.

An alternative to increase the maximum rate of production at Long Hill Quarry would be to supply the extra market potential from the Proponent’s other main dolerite pit at Leslie Vale. This scenario has disadvantages in that it would be necessary to cart the product through Hobart and up the Midland Highway to reach the market destinations. This would add a premium to the cost of the product making the Proponent’s bids for tenders uncompetitive. This would also increase the number of heavy truck movements on the Midland Highway causing greater congestion and perhaps delays for other road users.

Another alternative would be to buy the materials from other existing suppliers. This scenario would also reduce the competitiveness of the Proponent’s bid but also introduce risks associated with using unfamiliar products for construction works.

An alternative to the proposed expansion arrangement would be to retain the existing footprint and simply continue to excavate deeper. This scenario has disadvantages in that the faces would have to increase in height and the haul road would intrude on the area of the quarry floor.

4 **Public Consultation**

The application to upgrade the Long Hill Quarry is considered an ‘intensification’ of the existing ‘permitted’ use under Section 25 (1A) (b) of the *Environmental Management and Pollution Control Act 1994*. The legislation requires that the application is dealt with in accordance with Section 57 of the *Land Use Planning and Approvals Act 1993* (EMPCA). This section requires that the application is treated as discretionary and hence the planning authority must advertise the application and call for representations. As the existing activity is classified as a Level 2 under EMPCA the application must be directed to the Board of the Environment Protection Authority for consideration.

Stakeholders that have been consulted through this process include the following:
• Meander Valley Council has been consulted regarding the status of the existing permit and consideration of the Development Application.
• The Board of the Environment Protection Authority (EPA) through a Notice of Intent.
• Mineral Resources Tasmania will be asked to provide comment on the proposal by the EPA.
• Forestry Tasmania for authority to lodge a development application.
• Aboriginal Heritage Tasmania indicated that there is a low probability of Aboriginal heritage being present, has no objection to the project and recommended that no survey is required.

During the application assessment process these additional stakeholders will be consulted:

• Department of State Growth with regard to traffic implications on Dan Road and through the intersection with the Bass Highway.
• Policy and Conservation Assessment Branch of DPIPWE with regard to additional clearing required for the future quarry expansion.
• Any property owners that share a boundary with the development site through a direct notice from the Planning Authority.

5 THE EXISTING ENVIRONMENT

The Long Hill Quarry is located approximately 3 kilometres northeast of the township of Kimberly. At its closest approach the Bass Highway is 1.2 kilometres away but the quarry is concealed by intervening topography. The site is situated on top of a ridge line running parallel to and south of, the Long Hill ridgeline. Another lesser ridgeline runs between this unnamed ridgeline and the Mersey River. The three ridgelines run approximately NNW and rise to R.L. 350 metres above the Rubicon River plain at R.L. 160 metres to the east and the Mersey River plain at R.L. 50 to the west.

The native forest on the areas encompassing the quarry and processing area footprint have been previously harvested under the guidance of a forest practices plan number GPS0566. Conservation features specified in the forest practices plan are retained for this development. These features are described in Figure 4 as ‘wedge-tailed eagle exclusion’, ‘landscape reserve’ and ‘wildlife habitat clump’. Forest communities recently harvested from the development site include *Eucalyptus amygdalina* forest and woodland on dolerite (DAD) and *Eucalyptus amygdalina – Eucalyptus obliqua* damp sclerophyll forest (DSC). A nearby area of *Acacia dealbata* forest (NAD) will not be affected by the quarry development.

The area affected by the continued development of the footprint of the quarry is land previously harvested between the existing developed area and the mining lease boundary. The affected land is identified on Figures 4 and 5.
Figure 4: Long Hill Quarry relationship between mining lease boundary, wedge-tailed eagle nests, existing layout and proposed future activities
Plan Date: 10 November 2015
Figure 5: Long Hill Quarry showing existing layout and proposed future active areas.
Plan Date: 29 January 2016
Figure 6: Long Hill Quarry Sections through stage 3 and 4 quarry development.
Plan Date: 10 November 2015
5.1 PLANNING ASPECTS

The proposed upgrade of the Long Hill Quarry will be assessed by the Meander Valley Council.

(a) A permit under the Land Use Planning and Approvals Act 1993 (LUPAA) will be required.

(b) A single permit application will be lodged with the Meander Valley Council.

(c) The application will be made under Section 57 of LUPAA, meaning the application will be assessed through the ‘discretionary’ pathway.

(d) The land for the development site is zoned as Rural Resource. The development of extractive industries is consistent with the intent of the zone. No rezoning will be required.

(e) The proposal is for an ‘intensification’ of an existing use that has a current permit issued by the Meander Valley Council (PA\09\0284) with Permit Part B - Permit Conditions Environmental issued by the EPA (7859).

5.1.1 MEANDER VALLEY INTERIM PLANNING SCHEME (MVIPS) 2013

5.1.1.1 Section 3 Planning Scheme Objectives

In Section 3.3.1 the MVIPS states that an objective is to support the development of primary industry through the development of downstream processing where appropriate. The Long Hill Quarry takes a raw, natural product and converts it into a commodity that is used directly for road construction or as an essential component in concrete.

5.1.1.2 Section 5 and 6 Exemptions

There are no provisions in the MVIPS to exempt the intensification of an extractive use from assessment.

5.1.1.3 Section 8 Assessment of an Application for Use or Development

Table 8.2 Use Classes categorises the activity at Long Hill Quarry as an Extractive Industry.

5.1.1.4 Section 9.2 Development for Existing Discretionary Uses;

Section 9.2 does not apply in this instance because the development will substantially intensify the use.

5.1.1.5 Section 26 Rural Resource Zone:

The Long Hill Quarry is located on land that has the Rural Resource Zone applied. The zone purpose statement for this zone includes ... mining and other primary industries. The local Area Objectives for this zone includes support for a) Primary Industries and processing and services that support primary industries.

5.1.1.6 Section 26.3 Use Standards;

Section 26.3 provides for a mix of uses as long as the long term productive capacity of prime agricultural land is not compromised. The Long Hill Quarry is not located on Prime Agricultural Land

5.1.1.7 The Use Table for Rural Resource

The table classifies Extractive Industry as ‘Discretionary’ if for a Level 2 Activity.
5.1.1.8  E1 Bushfire Prone Areas
E1.4 Use or development that is exempt for this code; (b) a structure or building, which is not a habitable building. Habitable Building is defined as Class 2 to 9 building of the building Code of Australia. The buildings included in this development are existing and are classified as Class 10 private shed.

5.1.1.9  E2 Potentially Contaminated Land Code
There is no evidence or information to suggest there has been contamination of the land that is the subject of this application.

5.1.1.10  E3 Landslip Code
Ground stability is considered through the terms of the issue and renewal of Mining Lease 7M/2009. No extra provisions or restrictions have been applied to the Proponent for the operation of the Long Hill Quarry by Mineral Resources Tasmania. The proposed upgrade will not cause an increase in the risk of ground stability problems.

5.1.1.11  E4 Road and Railway Assets Code
This proposal will increase the number of vehicle movements using an existing junction between Dan Road and the Bass Highway. A Traffic Impact Assessment has been prepared to demonstrate compliance with the performance criteria.

5.1.1.12  E5 Flood Prone Areas Code
There are no areas on the site will be subject to flooding.

5.1.1.13  E5 Car Parking and Sustainable Transport Code
At full production it is likely that there will be a total of 8 employees working at the site. At least 10 carparks are already provided, no increase will be required.

5.1.1.14  E7 Scenic Management Code
The proposed development is located more than 100 metres away from the Bass Highway scenic corridor.

5.1.1.15  E8 Biodiversity Code
Level 2 Activities are exempt from this code.

5.1.1.16  E9 Water Quality Code
Level 2 Activities are exempt from this code.

5.1.1.17  E10 Environmental Impacts and Attenuation Code
Level 2 Activities are exempt from this code.

5.1.1.18  E13 Local Historic Heritage Code
There are no recorded instances of historic sites that can be affected by the proposal.

5.1.1.19  E14 Signage Code
No new signs will be required as part of this proposal.
5.2 ENVIRONMENTAL ASPECTS

The proposed upgrade of the Long Hill Quarry will cause an area of previously studied land to be cleared to expose the source rock. The timber from this land has been previously harvested by Forestry Tasmania in a logging operation. Although the remnant trees are not significant in themselves they may provide habitat for important species.

Native vegetation clearing has external effects such as potential direct loss of populations of important plants; loss of habitat for important creatures that may lead to a reduction in population; an increase in rainfall runoff causing sediment transport that can affect nearby waterways by affecting the aquatic flora and fauna habitat.

The land surrounding the Long Hill Quarry has been well studied; as part of the assessment process for the original proposal and previously for forest harvesting planning. The results of these studies appear in the Natural Values Atlas.

The original project to commercialise the Long Hill Quarry included special considerations for possible impacts on the breeding behaviour of a pair of wedge-tailed eagles with nests close by. A consequence of the original proposal was to develop the quarry in the direction of a nest (104). This nest had been productive by regularly producing offspring in the past. A wedge-tailed eagle management plan was approved and targeted observations were undertaken and records produced.

This proposal will take the active area of extractive operations away from this nest and closer to another recorded nest (1539). The most recent observation of this nest was recorded in 2008 and states that there were ‘no birds observed and the nest was dilapidated’.

The additional 7.9 hectare area of exposed ground associated with the development of the quarry footprint will be partly offset by a 3 hectare area of rehabilitation close to the haul roads and the crusher / screener circuit. There will be an increase in area of exposed ground of approximately 5 hectares generating extra rainfall runoff that must be accounted for in sediment retention facilities.

5.3 SOCIO-ECONOMIC ASPECTS

Additional investment in the Long Hill Quarry will benefit local suppliers, subcontractors and consultants as they assist with maintaining and managing the plant. The north of Tasmania is experiencing a severe down turn as a result of some important local businesses downsizing their operations. This investment will provide an economic boost at a critical time to help support confidence in the north of Tasmania.

The increase in operational capacity of the Long Hill Quarry is likely to generate additional employment for off-road truck drivers to cart products back and forth on site, additional maintenance and operators to man the crushing facility and more on-road truck drivers to cart the finished aggregates to the batch plants.

5.4 ALTERNATIVE SITES

No alternative sites were considered for this proposal.
6 POTENTIAL EFFECTS AND THEIR MANAGEMENT

6.1 AIR EMISSIONS

6.1.1 EXISTING CONDITIONS
The existing operation at Long Hill Quarry requires regular drilling and blasting to win the product; loading and short haul cartage to the primary crusher chute; the operation of a crusher / screener circuit producing product stockpiles; loading and short haul cartage to storage stockpiles and finally loading and long haul cartage to get the products to the market place.

6.1.2 PERFORMANCE REQUIREMENTS
The Environment Protection Policy (Air Quality) 2004 requires that point and diffuse source emissions to air should not cause harm to environmental values such as;

- life, health and wellbeing of humans,
- life, health and wellbeing of other life forms,
- visual amenity, and
- the useful life and aesthetic appearance of building property and materials.

6.1.3 POTENTIAL IMPACTS
At its closest point the Long Hill Quarry is situated over one kilometre from the Bass Highway and two kilometres from the nearest residence. The most likely impact resulting from dust will be occupational health impacts on workers at the plant.

There is a possibility that a significant dust plume lingering over the top of Long Hill could be observed from the Bass Highway.

6.1.4 AVOIDANCE AND MITIGATION MEASURES
A constraint on the existing operation is the scarcity of water on the site. Water is an essential additive in the crushing process and is useful to wet down roads and stockpiles in windy dry conditions. The upgraded operation will introduce a water storage reservoir that will provide ample water for all purposes including wetting down stockpiles, roads and loads.

The following management measures will be employed, when required, to ensure the site workers are not exposed to excessive levels of dust and reduce the potential for visible dust emissions from offsite vantage points:

- Short drop distances between conveyors, to stockpiles and into truck bins.
- Slow vehicle speeds (20 km/hr) for vehicles travelling on the site.
- Good site drainage will reduce the prevalence of mud on site that can dry to form dust.
- Water will be applied to stockpiles and haul roads in dry windy conditions.
- Loads will be covered or dampened if the load height exceeds the height of the tray sides.

If the water storage is inadequate to supply water from processing and dust suppression the Operator will revert to the existing procedure of purchasing water from local suppliers.
6.1.5 ASSESSMENT OF NET IMPACTS
Plentiful water following the upgrade will allow for more effective dust suppression actions.

<table>
<thead>
<tr>
<th>Item</th>
<th>Commitment</th>
<th>When</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dust suppression measures will be employed to minimise workers exposure to dust and prevent a dust plume visible off site.</td>
<td>When required</td>
<td>Operator</td>
</tr>
</tbody>
</table>

6.2 LIQUID WASTE
6.2.1 EXISTING CONDITIONS
The existing operation has two main catchment areas; the stockpiling, weighbridge and crushing / screening area and the extractive area. The stockpiling area reports to a perimeter drain on the southern fringe of the cleared area. The perimeter drain discharges into a sediment retention pond which in turn discharges into vegetation. Any flow discharging from the sediment retention pond will percolate through native vegetation for around 350 metres before encountering a defined drainage path.

The extractive area runoff collects in a sediment retention pond alongside the haul road out of the pit. This pond discharges into native vegetation above the stockpile area discharge point.

FIGURE 7: INTEGRATED CONSERVATION VALUE
6.2.2  PERFORMANCE REQUIREMENTS
The State Policy on Water Quality Management 1999 requires that point and diffuse source emissions to surface and groundwater should not cause harm to environmental values such as;

- the protection of aquatic ecosystems;
- recreational water quality and aesthetics;
- raw water for town drinking water supply;
- agricultural water uses, and
- industrial water supply.

The development should also be consistent with the objective and requirements of the Water Management Act 1999, the State Policy on Water Quality Management 1997 and the State Stormwater Strategy 2010.

6.2.3  POTENTIAL IMPACTS
If not controlled, run off from the quarry site could transport silt into the watercourse lower in the catchment. The silt would settle out on the bed of the watercourse smothering aquatic vegetation and macroinvertebrates reducing the watercourse’s habitat potential.

Watercourse (297816) is downstream of the quarry site has an Integrated Conservation Value of High as a result of recorded Special Values. There are records in this watercourse of the central north burrowing crayfish (*Engaeus granulatus*) which is a species listed as endangered by the state and national legislation.

6.2.4  AVOIDANCE AND MITIGATION MEASURES
The first avoidance measure is the location of the quarry site. The site occupies a ridge saddle which means that the catchment is limited to the site only, it is not necessary to consider drainage from other areas. The site is also remote from the nearest element defined as a watercourse (297816) so any runoff must flow overland through vegetation for a distance of approximately 350 metres before it enters the watercourse. This overland flow through vegetation will reduce the velocity of the water and cause any contained sediment to settle out in the woodland.

The Proponent has constructed a perimeter drain along the southern edge of the stockpile and crushing / screening area. This swale type drain has a low gradient and wide construction causing the runoff collected to move slowly and providing detention time before the runoff enters the sediment retention pond. The sediment retention pond will have a capacity to accommodate flows from a 1 in 20 year rain event.

The extractive area will drain towards the water supply reservoir. The crusher / screener plant will be serviced with water from this reservoir. The reservoir will have surplus capacity to contain run off from the site at all times.

The new extractive area is serviced by an existing sediment retention pond. This pond has ample capacity for the area disturbed through stripping and extraction of the Stage 3 and 4 areas. The overflow from the extractive area sediment retention pond is directed to the water supply reservoir and hence will be contained onsite.
6.2.5 Assessment of Net Impacts

Each catchment and associated sediment retention feature is evaluated in the Sediment Retention Calculations included in this document as Appendix 1. This document shows that the capacities provided will contain the run off from a 1 in 20 year rainfall event. The sediment will be captured in the sediment retention ponds and will gradually reduce the storage capacity. The calculations show that the sediment retention pond servicing the stockpiling crusher / screener area will need to be cleaned out on an annual basis.

<table>
<thead>
<tr>
<th>Item</th>
<th>Commitment</th>
<th>When</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>The existing sediment retention pond will capture runoff from the stages 3 and 4 extractions areas.</td>
<td>At all times</td>
<td>Operator</td>
</tr>
<tr>
<td>3.</td>
<td>Perimeter drains and sediment retention ponds will be cleaned out when their maximum capacity has been reduced to half or annually.</td>
<td>Annually</td>
<td>Operator</td>
</tr>
</tbody>
</table>

6.3 Groundwater

6.3.1 Existing Conditions

In the course of undertaking the excavations for the existing quarry operation a sediment retention pond and a sump were excavated in the floor of the main pit. Both these excavations are in fresh rock and hold water.

6.3.2 Assessment of Net Impacts

The experience with the existing excavations shows that the bedrock is impervious and that it is highly unlikely that the quarry operation will result in any change to groundwater discharge or recharge rates.

6.4 Noise Emissions

6.4.1 Existing Conditions

The Long Hill Quarry is situated within a working forest surrounded by pine plantations, regrowth eucalyptus forest and a forest conservation reserve. The closest residence is over two kilometres away towards the east and is screened by a substantial ridgeline, plantation forest and the Bass Highway.

The initial operation established for the Long Hill Quarry relied on primarily mobile equipment energised by diesel engines. Over the course of the operations life the mobile equipment has been gradually replaced with fixed equipment energised by electric motors. A consequence of the change has been to make the entire operation quieter.

6.4.2 Performance Requirements

The Quarry Code of Practice 1999 stipulates limits on the noise impacts at neighbouring sensitive uses (homes, hospitals, schools etc.);

- Noise from activities must not exceed 10 dB(A) above normal ambient noise levels during daytime operations ie between 0700 and 1900 on weekdays and 0800 to 1600 on Saturdays.
6.4.3 **Avoidance and Mitigation Measures**

Long Hill Quarry is located in a forested environment well separated from sensitive receptors. The closest receptors are residences situated in Kimberley or on farmland on the opposite side of the Bass Highway. Major noise sources on the quarry will be the crusher and blasting in the new extraction area. The proximity of these sources and the closest residences are tabulated below:

**Table 9: Separation Distance Between Noise Sources and Receptors**

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Address</th>
<th>Separation distance (kilometres)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Crusher</td>
</tr>
<tr>
<td>Residence</td>
<td>6770 Bass Hwy Elizabeth Town</td>
<td>1.89</td>
</tr>
<tr>
<td>Residence</td>
<td>118 Morrison St Kimberley</td>
<td>1.95</td>
</tr>
<tr>
<td>Residence</td>
<td>126 Morrison St Kimberley</td>
<td>1.88</td>
</tr>
<tr>
<td>Residence</td>
<td>125 Morrison St Kimberley</td>
<td>1.89</td>
</tr>
<tr>
<td>Residence</td>
<td>1340 Railton Rd Merseylea</td>
<td>2.09</td>
</tr>
</tbody>
</table>

6.4.4 **Assessment of Net Impacts**

The increase in the maximum annual production will be achieved with the recently changed electrically energised equipment already installed. This equipment is capable of the increased throughput without running for extended hours or late at night.

A consequence of the upgrade to the operation will be an increase in the period of operation or number of on-site mobile equipment including excavators and wheel loaders and more off-site movements of cartage trucks. To achieve the maximum annual production rate for the upgraded operation the frequency of blasting will be increased but not the scale. At full production a blast with similar characteristics to the existing blasts will occur every month.

- On site mobile equipment will be screened from the closest residence by the topography of the Long Hill ridgeline, plantation forest and a distance of over two kilometres.
- Off-site movements of trucks originating from the quarry will join the existing heavy vehicle traffic load on the Bass Highway. It is unlikely the increase in traffic from the quarry will be discernible.
- The Quarry Code of practice sets acceptable separation distances between receptors and various activities occurring on a quarry site:
  - Blasting – recommended separation 1 kilometre
  - Crushing – separation distance 750 metres
  - Screening – separation distance 500 metres
  - Ripping pushing – separation distance 300 metres

It can be seen from Table 9 the closest residences are approaching double the recommended separation distance from quarry activities. The separation distance augments the attenuating effect of parallel ridgelines running beside the quarry site effectively screening the operation from the...
residences. In addition the forest surrounding the quarry and noise from the Bass Highway are likely to add to ambient noise further screening the noise from the quarry.

It is highly unlikely that any residents will be affected by the increase in noise from the upgraded Long Hill Quarry operation.

<table>
<thead>
<tr>
<th>Item</th>
<th>Commitment</th>
<th>When</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Blasts of a similar scale to existing will occur up to a frequency of one per month.</td>
<td>Monthly</td>
<td>Operator</td>
</tr>
</tbody>
</table>

6.5 SOLID AND CONTROLLED WASTE MANAGEMENT

6.5.1 EXISTING CONDITIONS
The upgraded Long Hill Quarry will continue to operate in a similar manner to the existing operation. Recent improvements resulting from replacing mobile equipment with fixed equipment energised by electrical power will reduce the requirement for on-site servicing. Reduced servicing has also reduced the amount of waste originating from redundant parts, spares and packaging.

The existing amenities block will be maintained to service the upgraded operation and the existing pump out arrangement for human waste will continue.

There is currently redundant equipment and materials stored on the site at the entrance to the new extraction area.

The new area of extraction has minimal over-burden and topsoil over laying the resource. What overburden is present will be stockpiled separate to the topsoil or taken directly to the rehabilitation areas to facilitate ground contouring works.

6.5.2 PERFORMANCE REQUIREMENTS
Standards for the storage and disposal of general waste are included in:


The Quarry Code of Practice 1999 states that all waste must be removed from the site on a progressive basis and recycled wherever possible.

6.5.3 AVOIDANCE AND MITIGATION MEASURES
All waste will be managed in accordance with the hierarchy of waste management displayed below:

- avoidance
- recycling/reclamation
- re-use
- treatment
- disposal
Redundant equipment, products and materials abandoned on the site as a result of the recent changes in the operating equipment will be removed from site and passed into the appropriate waste streams.

6.5.4 ASSESSMENT OF NET IMPACTS
The upgrade of the Long Hill Quarry will require more hours of operation of the mobile equipment on site. This increase in servicing requirements and associated waste will be partly offset by the recent reduction in servicing requirements for the new equipment energised by electrical power. The net change is likely to be nil.

<table>
<thead>
<tr>
<th>Item</th>
<th>Commitment</th>
<th>When</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Redundant equipment arising from the upgrade works will be removed from site.</td>
<td>On approval</td>
<td>Operator</td>
</tr>
</tbody>
</table>

6.6 DANGEROUS GOODS

6.6.1 EXISTING CONDITIONS
Blasting operations at the Long Hill Quarry introduce explosives to the site while the Blasting Contractor is preparing the shot on the site.

There is mobile equipment on the site that require diesel for fuel. Hydrocarbons are considered to be an environmentally hazardous material.

6.6.2 PERFORMANCE REQUIREMENTS
The existing operation uses diesel engines to energise temporary fixed and mobile plant at the site. Hydrocarbons can be considered dangerous to the environment and to workers.

Standards on the storage, handling and transport of dangerous goods are included in:

- Environment Management and Pollution Control Act 1994
- Dangerous Goods (General) Regulations 1998
- Quarry Code of Practice 1999
- Explosives Act 2012
- Explosives Regulations 2012
- Dangerous goods (Road and Rail Transport) Act 2010
6.6.3 AVOIDANCE AND MITIGATION MEASURES
Fuel used to energise mobile plant at the Long Hill Quarry will be stored in a fully bunded storage tank similar to the one displayed, installed in accordance with the manufacturer’s recommendations. Lubricants will be stored inside a bunded container in a secure location on the site.

![PLATE 1: TRANSTANK T 20SS](image)

All explosives will be brought to the site by a fully qualified Blasting Contractor and will be taken off site when the blast has been completed.

6.6.4 POTENTIAL IMPACTS
The proposal to upgrade Long Hill Quarry will cause explosives to be brought onsite the site more frequently to facilitate more frequent blasting. The transport storage and handling of the explosives will be managed by a fully qualified and certified blasting contractor.

6.6.5 ASSESSMENT OF NET IMPACTS
Upgrading Long Hill Quarry will not result in an increased risk associated with dangerous goods. Existing storage facilities will continue to be utilised and all explosives will managed in accordance with the legislation.

<table>
<thead>
<tr>
<th>Item</th>
<th>Commitment</th>
<th>When</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Diesel fuel required for site mobile equipment will be stored in a proprietary fully bunded 20 000 litre ‘Transtank’.</td>
<td>At all times</td>
<td>Operator</td>
</tr>
</tbody>
</table>

6.7 BIODIVERSITY AND Nature Conservation Values

6.7.1 EXISTING CONDITIONS
The Long Hill Quarry is located within a managed native forest setting. The site had been harvested immediately prior to the original forest practice plan quarry being upgraded. The entire quarry footprint area including the now proposed stage 3 and stage 4 development areas was heavily disturbed. Stage 3 and 4 areas have not been disturbed subsequently to the original harvesting and regeneration has occurred over the intervening period.
6.7.2 PERFORMANCE CRITERIA
Requirements for identifying natural values and protecting biodiversity are included in:

- Threatened Species Protection Act 1995 (TAS)
- Environment Protection and Biodiversity Conservation Act 1999 (Cth)
- DPIWE Quarry Code of Practice 1999
- Weed Management Act 1999 (TAS)

6.7.3 POTENTIAL IMPACTS

6.7.3.1 Flora
The original application to develop the Long Hill Quarry required an amount of clearing to expose the resource in stages 1 and 2. An ecological consultant undertook a flora and fauna assessment (Bushways (A), Dec 2009), which failed to find examples of listed flora or communities within the proposed development areas. The report explained that the recent harvesting work may have covered individuals or communities of listed species. It was recommended that if clearing works were to occur subsequent to the original works, the previously surveyed areas should be surveyed again to identify any listed plants that may have regenerated in the intervening period.

6.7.3.2 Fauna
The Proponent was aware that there are wedge-tailed eagle (Aquila audax subsp. Fleayi) nests located in the Long Hill Conservation Area adjacent to the quarry site. Advice from a zoologist with experience in the field of wedge-tailed eagle behaviour suggested that the quarry operation and even blasting may not have an adverse impact. The Proponent engaged the zoologist to undertake a program of detailed monitoring of activity in the nest closest to the quarry. The plan resulted in a series of observations taken as various activities occurred on the quarry site in accordance with an approved monitoring plan (Mooney N., 2010).

Proposing to develop the quarry into a new area posed a problem as the quarry extractive activities would located further away from the nest studied in the management plan but closer to a nest that was not well known.

6.7.4 AVOIDANCE AND MITIGATION MEASURES

6.7.4.1 Flora
An ecological consultant was engaged to evaluate the previous study and undertake a new survey of the area identified as stage 3 and 4. The subsequent report (ECOtas, 2015) is included here as Appendix 2. The report found that the original report was accurate and although it was possible that listed species could have regenerated in the previously disturbed areas, this was not the case. It was found that the proposed expanded quarry operation would not have a deleterious effect on threatened vegetation, flora or fauna. The report also recommends that careful management of the site in relation to weeds and hygiene is recommended. The original weed management plan (Bushways (B), Nov 2009) is still current and will continue to be applied to operations at the Long Hill Quarry site. The Weed Management Plan is included here as Appendix 3. The recommended protocol for weed and disease hygiene has changed and hygiene actions on the site will comply with the current protocol (DPIPWE, Mar 2015).
6.7.4.2 Fauna
The Proponent engaged a zoologist to consider the possible impacts associated with the change in the extractive operations and to undertake another series of surveys to gauge the status of the wedge-tailed eagle nests located in the conservation area. The survey work was undertaken and a report produced (Mooney N., 2015) and is included here as Appendix 4. The report finds the original nests considered 144 and 144a have been productive in the years since the original quarry development was undertaken with only one year, 2013, unsuccessful. The report also found the nest 1539, which is closest to the new development area has been abandoned.

6.7.5 ASSESSMENT OF NET IMPACTS
The onsite ecological assessment found that the expansion of the Long Hill Quarry into the stage 3 and 4 areas will not have an adverse impact on flora and fauna values.

The additional work by the zoologist suggests that the new work is unlikely to affect the behaviour of wedge-tailed eagles. The Proponent will apply the recommendation to continue monitoring of the important nest sites 144 and 144a.

The prescriptions of the original weed management plan will continue to be implemented in relation to ongoing monitoring and control of weeds as they occur and strict hygiene requirements for mobile equipment entering the site.

By continued surveillance of the wedge-tailed eagles, and continuing to apply the weed management provisions the Proponent will ensure that the upgrade of the Long Hill Quarry will have a negligible effect on the biological values of the surrounding forests and woodlands.

<table>
<thead>
<tr>
<th>Item</th>
<th>Commitment</th>
<th>When</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>The prescriptions of the original weed management plan will continue to be applied for the upgraded operation.</td>
<td>At all times</td>
<td>Operator</td>
</tr>
<tr>
<td>8.</td>
<td>Where recommended weed and disease hygiene protocols disagree actual works will comply with (DPIPWE, Mar 2015)</td>
<td>At all times</td>
<td>Operator</td>
</tr>
<tr>
<td>9.</td>
<td>Surveillance of wedge-tailed eagle behaviour will continue until the end of the 15-16 breeding season</td>
<td>Feb 2016</td>
<td>Operator / Zoologist</td>
</tr>
</tbody>
</table>

6.8 MARINE AND COASTAL
The Long Hill Quarry is located at least 30 kilometres away from the headwaters of the Port Sorell river system that reports to Bass Strait. It is highly unlikely that the upgrade of the Long Hill Quarry can have an impact on marine or coastal areas.
6.9 **GREENHOUSE GASES AND OZONE DEPLETING SUBSTANCES**

6.9.1 **EXISTING CONDITIONS**

Quarry operations generate direct greenhouse gas emissions through burning fuel to energise equipment and indirectly through using electrical power that has been generated by burning fuels.

6.9.2 **PERFORMANCE CRITERIA**

The current annual threshold for greenhouse gas emissions (GHG) from a single facility that will trigger the *National Greenhouse and Energy Reporting Act 2007* is 25 kilo-tonnes (kt) of CO2 equivalent gas per annum (Clean Energy Regulator, 2015).

6.9.3 **POTENTIAL IMPACTS**

The mobile equipment listed below will be operating on the site and generating direct GHG emissions:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Hours operated annually (hr)</th>
<th>Average diesel fuel consumption (L/hr)</th>
<th>Annual consumption (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandvick Tamrock 700</td>
<td>600</td>
<td>25</td>
<td>15 000</td>
</tr>
<tr>
<td>Hitachi 770 wheel loader</td>
<td>2 300</td>
<td>40</td>
<td>92 000</td>
</tr>
<tr>
<td>Komatsu HD325 dump trucks (1x)</td>
<td>2 300</td>
<td>27</td>
<td>62 100</td>
</tr>
<tr>
<td>Excavator 50t (c/- breaker)</td>
<td>600</td>
<td>25</td>
<td>15 000</td>
</tr>
<tr>
<td>Komatsu WA430 wheel loader</td>
<td>1 500</td>
<td>30</td>
<td>45 000</td>
</tr>
<tr>
<td>Mechanical screener</td>
<td>3,500</td>
<td>5</td>
<td>17 500</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>246 600</td>
</tr>
</tbody>
</table>

From the current GHG Emission Factors (Department of the Environment, August 2015) the energy content of diesel used for transport purposes is 38.6 Giga Joules/tonne (GJ/t) - *Table 4: Fuel combustion emission factors – liquid fuels and certain petroleum based products for transport energy purposes*.

Emission factors are; CO₂ - 69.2 kg CO₂-e/GJ, CH₄ - 0.20 kg CO₂-e/GJ, N₂O – 0.50 kg CO₂-e/GJ.

The direct GHG emissions for mobile plant are:

\[
247 \times 38.6 \times 69.2 = 659.8 \text{ t CO}_2 \\
247 \times 38.6 \times 0.20 = 1.9 \text{ t CH}_4 \\
247 \times 38.6 \times 0.50 = 4.7 \text{ t N}_2\text{O} \\
\text{Total} = 666.4 \text{ t CO}_2\text{-e}
\]
Prior to upgrading, the fixed plant was energised by portable generator sets as there was not sufficient electrical power capacity on the site. For the purpose of these calculations these gen-sets will be treated as additional mobile equipment:

**TABLE 11: FUEL CONSUMPTION OF FIXED EQUIPMENT USED ON SITE**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Hours operated annually (hr)</th>
<th>Average diesel fuel consumption (L/hr)</th>
<th>Annual consumption (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary crusher and secondary crusher circuit powered by generator set</td>
<td>3 500</td>
<td>125</td>
<td>437 500</td>
</tr>
<tr>
<td>Supplementary generator set</td>
<td>3 500</td>
<td>78</td>
<td>273 000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>710 500</td>
</tr>
</tbody>
</table>

From the current GHG Emission Factors (Department of the Environment, August 2015) the energy content of diesel used for stationary energy purposes is 38.6 Giga Joules/tonne (GJ/t) - Table 3: Fuel combustion emission factors – liquid fuels and certain petroleum based products for stationary energy purposes.

Emission factors are; CO₂ - 69.2 kg CO₂-e/GJ, CH₄ - 0.10 kg CO₂-e/GJ, N₂O – 0.20 kg CO₂-e/GJ.

The direct GHG emissions for gen sets energising fixed plant are:

\[
\begin{align*}
711 \times 38.6 \times 69.2 & = 1899.2 \text{ t CO₂} \\
711 \times 38.6 \times 0.10 & = 2.7 \text{ t CH₄} \\
711 \times 38.6 \times 0.20 & = 5.5 \text{ t N₂O} \\
\text{Total} & = 1907.2 \text{ t CO₂-e}
\end{align*}
\]

Scope 2 emissions are indirect GHG emissions derived from the consumption of purchased electricity. When the upgrade of the operating equipment is completed the plant will consume the equivalent amount of power as that currently generated by the generator sets. This is a conservative calculation as the supplementary generator is not operating at full capacity.
TABLE 12: ELECTRICAL ENERGY CONSUMPTION OF FIXED EQUIPMENT USED ON SITE

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Hours operated annually (hr)</th>
<th>Power consumption (kW)</th>
<th>Annual consumption (kW/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary crusher and secondary crusher circuit powered by generator set</td>
<td>3 500</td>
<td>1 200</td>
<td>4 200 000</td>
</tr>
<tr>
<td>Supplementary generator set</td>
<td>3 500</td>
<td>750</td>
<td>2 625 000</td>
</tr>
<tr>
<td>Weighbridge facility security lights &amp; pumps</td>
<td>2 300</td>
<td>15</td>
<td>34 500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>6 859 500</strong></td>
</tr>
</tbody>
</table>

There is an emission factor applied to electrical power generation that relates to the predominant energy source used by the power generation company to produce the electrical energy. Tasmania has a low factor due to the high proportion of renewable energy generation in the state.

\[
6 859 500 \times \left(\frac{0.12}{1000}\right) = 823 \text{ t CO}_2\text{-e per annum}
\]

Total GHG emissions before electrical upgrade:

\[
666.4 + 1 907.2 = 2 573.6 \text{ t CO}_2\text{-e per annum}
\]

Total GHG emissions subsequent to the electrical upgrade:

\[
672 + 823 = 1 495 \text{ t CO}_2\text{-e per annum}
\]

The reporting threshold for GHG emissions from an individual facility is 25 000 t CO\textsubscript{2}-e per annum. The Long Hill Quarry is not required to report under the *National Greenhouse Gas and Energy Reporting Act 2007*.

6.10 HERITAGE

6.10.1 EXISTING CONDITIONS

6.10.1.1 European heritage
There are no properties or sites listed as having heritage significance in the vicinity of the Long Hill Quarry.

6.10.1.2 Aboriginal cultural heritage
A field survey was conducted over the land as part of the original application assessment (CHMA, Nov 2009). The report found no evidence of Aboriginal heritage on the site and that it was unlikely that cultural sites or artefacts would be discovered during the course of the works. A recent review of the original studies and current data found there was a low probability of the works encountering aboriginal cultural heritage and a new heritage investigation was not warranted.
6.10.2 Assessment of net impacts
Advice received suggests that it is highly unlikely that the proposed works will impact on European or Aboriginal cultural heritage.

The Proponent will take the recommendations of an Unanticipated Discovery Plan into account when carrying out the clearing for the stage 3 and stage 4 development works.

<table>
<thead>
<tr>
<th>Item</th>
<th>Commitment</th>
<th>When</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.</td>
<td>The provisions of an Unanticipated Discovery Plan will be applied to any clearing of undisturbed areas.</td>
<td>At all times</td>
<td>Operator</td>
</tr>
</tbody>
</table>

6.11 Land use and development

6.11.1 Existing conditions
The Long Hill Quarry is located in the midst of a working forest. The actual quarry footprint was extensively harvested by Forestry Tasmania in 2009 before the initial clearing took place.

The Long Hill Conservation Area is situated on the southwest boundary of the mining lease. This area is heavily forested and limited access. Both roads that provide access to the conservation area are controlled access roads managed by Forestry Tasmania. Dan Road is used by the quarry and is secured with a boom gate out of hours and the other unnamed road is has a Forestry Tasmania boom gate which is normally locked.

6.11.2 Assessment of net impacts
Apart from the temporary loss of a small area of prospective regrowth forest while the operation continues, there will be no other impact on the capacity of others to pursue enterprises in the vicinity of the quarry.

6.12 Visual effects

6.12.1 Existing conditions
The existing operation is well screened for public view. The clearing that took place for the harvesting operation preceding the original quarry development could not be observed from public vantage points.

6.12.2 Avoidance and mitigating measures
The Long Hill Quarry operation cannot be observed from vantage points accessible to the public. The actual Long Hill Ridgeline runs parallel to the quarry ridge screening the view from the Bass Highway. Another parallel running ridgeline screens the operation from any vantage points on Railton Road or from Kimberley. There are no other public access points in the proximity of the quarry.

6.12.3 Assessment of net impacts
The upgraded quarry operation will be developed on forested land that has been harvested previously by Forestry Tasmania. The harvesting activities were not discernible from public vantage points; it is therefore unlikely that the quarry operation will be discernible.

6.13 SOCIO-ECONOMIC ISSUES

6.13.1 EXISTING CONDITIONS
The Proponent has invested around $6.5 M in establishment costs for the existing operation since the initial start-up in 2010. The Proponent’s corporate structure includes variety of functional companies that can provide various goods and services to the Proponent and the operating company. These ‘under the umbrella’ companies compete against external companies in the provision of goods and services. With this structure the Proponent maintains a workforce of close to 500 direct employees throughout the separate organisations.

6.13.2 PROPOSED UPGRADE
It is likely that a further $2.5 M will be invested in further development of the process line equipment to enable an increase in production. There will also be new work in clearing an area to commence the development of the new pit. Heavy civil works will be required to remove and stockpile overburden and development drilling and blasting will be required to form the extraction faces.

Rehabilitation activities will be undertaken on the areas nominated in the mining and rehabilitation plans. The earthworks are likely to be undertaken by quarry employees but the revegetation works will be undertaken by quarry employees and sub-contractors.

6.14 HEALTH AND SAFETY ISSUES

6.14.1 EXISTING CONDITIONS
The Long Hill Quarry operation will continue unchanged from the existing operation. A higher production rate will be achieved by less shutdowns and a higher equipment throughput. The existing health and safety risks associated with the operation include:

- Frequent operation of heavy machinery with exposure to moving machinery and mobile plant.
- Transport and use of explosives for blasting.
- Emissions of dust from blasting, crushing and processing of rock containing quartz.
- Emission of noise from blasting, crushing and machinery operation.

The Quarry Operator is responsible for ensuring that all employees have a safe and healthy workplace and that the risk to themselves and others arising from the activities they undertake is as low as reasonably practical.

6.14.2 PERFORMANCE REQUIREMENTS
The Proponent and quarry operator are required to comply with the Legislation listed below:

- Work Health and Safety Act 2012
6.14.3 AVOIDANCE AND MITIGATION MEASURES
The quarry operator has over sixty years’ experience controlling heavy machinery and transport operations. The Proponent employs a Safety, Health and Environment Manager and deploys a comprehensive array of safety management procedures referring to quarry operations and the operation of heavy machinery.

Blasting at the site is performed by a professional blasting contractor. A site specific hazard analysis and risk assessment is carried out and documented prior to blasting. A blasting plan is designed for the site and modified as extraction activities progress. Storage and handling of the explosives is in accordance with the Security-sensitive Dangerous Substances Act 2005 (TAS) and the Security-sensitive Dangerous Substances Regulations 2005.

The recent redevelopment included a number of initiatives to make the operation safe for operating personnel. The initiatives included:

- State of the art guarded and interlocked access for servicing conveyors,
- Full guarding to all pinch points on conveyors and shafts,
- Ensuring that frequently replaced component are no heavier than 20 kg.

6.14.4 ASSESSMENT OF NET IMPACT
The Long Hill Quarry operational equipment has been recently upgraded and represents the ‘State of the Art’ for modern and safe heavy machinery. The Operator is well experienced and well serviced with safety risk assessment procedures to enable their employees to evaluate and effectively control safety hazards of the site.

<table>
<thead>
<tr>
<th>Item</th>
<th>Commitment</th>
<th>When</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>A safe and healthy workplace will be provided to workers and safety risks will be kept as low as reasonably practical</td>
<td>At all times</td>
<td>Operator</td>
</tr>
</tbody>
</table>

6.15 HAZARD ANALYSIS AND RISK ASSESSMENT
6.15.1 EXISTING CONDITIONS
The environmental hazards associated with the existing quarry operation will remain unchanged, the scale of the hazards and the frequency of the exposure will increase with the increase in production and area of disturbance.

6.15.2 PERFORMANCE REQUIREMENTS
This preliminary analysis should systematically identify all potential major hazards (internal and external) to the environment associated with the changed operation and offer controls in order to reduce the risks to acceptable levels.
6.15.3 AVOIDANCE AND MITIGATION MEASURES
The hazard analysis and risk assessment included as Appendix 5 found that by applying the controls described in this environmental management plan the residual risks of most hazards could be brought to within the low range. Two risks remain in the moderate range after the application of controls:

- Sediment transport from the quarry affects the aquatic environment in the nearest natural watercourse.
- The quarry operation becoming a vector for weeds that will spread into the Long Hill Conservation Area.

The site runoff calculations show the sediment retention ponds introduced for this proposal will control site run off for up to 1 in 20 year storm events. In addition to these active controls, progressive rehabilitation and re-vegetation of disturbed areas and defined drainage paths separate from traffic paths on site will further protect from sediment transport off site.

The quarry operator will apply the principles of the Weed and Disease Planning and Hygiene Guidelines (DPIPWE, Mar 2015) in transporting equipment on and off the site. The Operator will continue to monitor the site twice annually for new weed incursions and will eradicate any weeds presenting within the works areas and woodland fringes.

6.15.4 ASSESSMENT OF NET IMPACTS
The controls introduced in this Environmental Management Plan will reduce the risks identified in the Hazard Analysis and Risk Assessment to acceptable levels.

<table>
<thead>
<tr>
<th>Item</th>
<th>Commitment</th>
<th>When</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.</td>
<td>The controls included in this Environmental Management Plan will applied to keep environmental risk to an acceptable level.</td>
<td>At all times</td>
<td>Operator</td>
</tr>
</tbody>
</table>

6.16 FIRE RISK
6.16.1 EXISTING CONDITIONS
The Long Hill Quarry operation is situated in a forested region which exposes the site to the risk of a bush fire approaching from any direction. Wind observations at the Devonport Airport show that the strongest winds during the summer months are predominantly from the north and west in the afternoon (BOM, 1991 - 2015).

The highest bushfire exposure is therefore from this direction. Farm land around Kimberly to the west of the quarry site is unlikely to be a source of an uncontrolled bushfire and access to the forested conservation area is restricted, which reduces the potential threat from this direction. To the northwest the Long Hill Ridgeline and associated structures are either forested with native species or with pine plantations.
6.16.2 POTENTIAL IMPACTS
The location of the quarry in the midst of a forested landscape results in the potential for the site to be affected by bushfire in two scenarios:

- The works and equipment can be an ignition source for a bushfire that would run away affecting infrastructure and potentially private property, and
- the site could be affected by a bushfire from another source.

6.16.3 AVOIDANCE AND MITIGATION MEASURES
The Long Hill Quarry site is a cleared area that will not carry fire. The original proposal included upgrading Dan Road improving access and egress from to quarry and this area of forest.

Included in the operating procedures for the operations and maintenance teams are restrictions on performing ‘hot work’ on days of total fire ban. Temporary buildings and structures will have fire extinguishers to provide a first strike capacity to supress any fires that may commence in these facilities.

The water supply reservoir that forms part of this proposal will be a major water source that is easily accessible by helicopter to help sustain a concentrated firefighting attack.

6.16.4 ASSESSMENT OF NET IMPACT
The Long Hill Quarry site is protected by at least an 11 hectare fuel modified zone that will separate the equipment and site facilities from a threatening bushfire. Procedures on site will guard against the quarry operation from becoming an ignition source.

In the event of a bushfire approaching the site, it is likely that the decision will be made to evacuate the site ‘if safe to do so’ and allow Tasmania Fire Service to use the relative safety of the site for firefighting purposes.

<table>
<thead>
<tr>
<th>Item</th>
<th>Commitment</th>
<th>When</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>A moratorium will be applied to ‘Hot Work’ on days of total fire ban</td>
<td>At all times</td>
<td>Operator</td>
</tr>
<tr>
<td>14.</td>
<td>If a bushfire threatens the site personnel will evacuate.</td>
<td>As required</td>
<td>Operator</td>
</tr>
</tbody>
</table>

6.17 INFRASTRUCTURE AND OFF-SITE ANCILLARY FACILITIES
6.17.1 EXISTING CONDITIONS
The Long Hill Quarry is and will remain quite self-sufficient. The electrical power supply has been recently upgraded to enable a new electrically energised process line to be introduced.

The site is dependent on direct access to the Bass Highway to enable fast and efficient delivery of the quarry products to the market place.

6.17.2 ASSESSMENT OF NET IMPACT
The power requirements for the upgraded operation will be met by the existing infrastructure provided by Aurora. No additional transmission lines, substations or transformers will be required.

The Bass Highway provides a fast and efficient freight route to carry the products to the market place, no upgrades of the road infrastructure is required to service the upgraded operation.

6.18 ENVIRONMENTAL MANAGEMENT AND SYSTEMS

6.18.1 EXISTING CONDITIONS

The Long Hill Quarry operates under the terms and conditions of the Mining Lease Schedules for ML 7M/2007 and Meander Valley Permit no. P09.0284 with ‘Permit Part B Permit Conditions – Environmental’ No. 7859 imposed by the EPA.

These conditions impose the general requirements of the Quarry Code of Practice and specific requirements relating to prescriptions in the;

- wedge-tailed eagle monitoring and management plan;
- the weed management plan; and
- limitations on noise at particular times of the day.


6.18.2 ASSESSMENT OF NET IMPACTS

The upgraded Long Hill Quarry operation is able to continue to operate within the restrictions imposed by the existing permit conditions except for condition C1 where the maximum area of unrehabilitated land will need to be increased to 16 hectares.

6.19 CUMULATIVE AND INTERACTIVE EFFECTS

6.19.1 EXISTING CONDITIONS

The only activities that are likely to occur in the vicinity of the Long Hill Quarry will be forest or plantation harvesting by Forestry Tasmania contractors. Further afield farm activities will occur but these are not likely to cause emissions to accumulate with those from the quarry operation.

There are no other quarries existing or proposed in the vicinity of the Long Hill Quarry operation.

6.19.2 ASSESSMENT OF NET IMPACTS

Clearing associated with forest product harvesting can cause an increase in rainfall runoff into natural waterways. Any forest operations will be conducted in accordance with the Forest Practices Code which will cause mitigating measures to be introduced to prevent soil erosion and sediment transport into waterways.

Both activities will impose controls to protect the receiving aquatic environment and hence there should not be any accumulative effect.
6.20 TRAFFIC IMPACTS

6.20.1 EXISTING CONDITIONS
The current Long Hill Quarry operation has an annual output of 100 000 cubic metres equating to approximately 10 000 truck movement per year. A significant redevelopment of the junction onto the Bass Highway was introduced as part of the original proposal.

6.20.2 PERFORMANCE CRITERIA
The MVIPS has a Road and Railway Assets Code requiring a Traffic Impact Assessment (TIA) for instances where a new development causes an increase in traffic through an access of more than 10 percent.

6.20.3 AVOIDANCE AND MITIGATION MEASURES
This proposal has the potential to increase the traffic through the access on the Bass Highway by 100 percent; therefore a TIA was undertaken and is included in the document as Appendix 6.

6.20.4 ASSESSMENT OF NET IMPACTS
The TIA found:

- The recently upgraded intersection with the Bass Highway is fit for eservice for the proposed increase in traffic movements.
- The majority of movements will be turning west and the Bass Highway pavement is sound and will carry the increase traffic load.
- Current signage and line marking meets the appropriate standard.

The assessment concluded a high level of safety and service provided by the existing intersection geometry will be maintained after the increase in traffic movements.

(RJK Consulting Engineers, Nov 2015)
7 MONITORING AND REVIEW

7.1.1 AIR EMISSIONS
Quarry operations personnel will consider the level of dust generated by activities occurring on any particular day and if a dust plume visible off-site is occurring will apply control measures to suppress the dust.

7.1.2 SEDIMENT RETENTION PONDS
The sediment retention ponds and site drainage will be inspected periodically to determine remaining capacity. If the capacity of the drain or pond is reduced to half the total the accumulated sediment will be clean out.

7.1.3 WEED MANAGEMENT PLAN
The site will be periodically surveyed for weed incursions and action taken immediately if new outbreaks are observed. Weed management will be undertaken in accordance with the weed management plan (Bushways (B), Nov 2009), which is included in this document as Appendix 3. This plan was prepared for the original commercialisation of the Long Hill Quarry.

The most recent work by ‘Wapstra’ confirms that the predicted focus for weed management on the site is still current and the prescriptions included in the plan remain appropriate.

8 DECOMMISSIONING AND REHABILITATION
From Section 2.1 the resource potential to the 300 metre level of the stage 3 and 4 extraction area is 7.8 Mt or around 24 years at full production. The original excavation shows that the ample source rock lies below this level.

Geological mapping indicates that the dolerite sill exposed by Long Hill Quarry is underlain by Permian sedimentary rock. The contact between the two formations is concealed by a band of dolerite talus but would be expected to be between elevation 160 and 200. It is likely therefore that there is around 80 metres thickness of source rock below the stage 2 pit.

When the quarry is due to close the Operator and Lease Holder will be required to rehabilitate the site. Assuming that the quarry does expand beyond the boundaries delineated by this plan, there will be an area of un-rehabilitated land totalling 16 hectares.

This total area can be divided into three separate areas:

- Stockpiles, weighbridge and crushing / screening
- Rehabilitation area
- Stage 3 and 4 extraction
8.1 REHABILITATION PROGRAM OBJECTIVES

The objective of the rehabilitation program will be to encourage the disturbed areas to revegetate with a native species community similar to that surrounding the site. Some infrastructure including the access road and an area for hard standing will remain. The water storage reservoir will also remain for use by forest managers for firefighting purposes.

The surrounding woodlands communities are described as DSC *Eucalyptus amygdalina* / *E. obliqua* damp sclerophyll forest grading to DAD *E. amygdalina* forest and woodland on dolerite on the drier northern slopes. The wetter southern slopes are characterised by WOB *E. obliqua* wet forest with broad-leaf shrubs. The rehabilitation areas will necessarily have thin topsoils and lack shelter from sun and wind so the rehabilitation effort will attempt to emulate the dryer community DAD.

Plants should be selected from the Planting Schedule where seeding and planting is required.

8.2 STOCKPILE, WEIGHTBRIDGE & CRUSHING / SCREENING

Upon decommissioning the stockpiles will be depleted, the weighbridge, servicing container and site office will be taken off site. The trafficked surface that has been compacted over the years will be ripped to enhance infiltration of rainfall runoff. Overburden has been placed around the perimeter of the trafficked area to provide a more level surface for vehicles. This overburden will be pulled up and roughly run out over the stockpiling area. Any remaining topsoil will be spread over this surface.

The sediment retention / cut off drain along the southern perimeter of the stockpile area will be retained. Maintenance will be required to ensure that the cut off drain does not block until such time as ground cover is established over the fresh surfaces.

The fixed crushing / screening equipment will be isolated from electrical energy and the electrical connection terminated. The equipment will be disassembled and taken off site. Any foundations used to secure equipment will be broken up and the waste concrete taken off site.

Where possible the trafficked surfaces will be ripped to encourage infiltration. Overburden and unsuitable products will be placed against the existing face to lower the overall height. Any topsoil remaining from the original stripping will be recovered and spread over the surface. The connection to the original forestry service road will be re-established and the saddle area retained as a parking / assembly area for firefighters and emergency services with helicopter landing capability.

8.3 REHABILITATION

The land surrounding the water storage reservoir will be rehabilitated to reduce the overall area of un-rehabilitated land. The access road to the reservoir will be retained as a filling point for rural firefighting tankers. The reservoir will be retained as a filling point for helicopter firefighting activities.

The overflow from the water supply reservoir will continue to discharge into the existing sediment retention pond alongside the service road. This pond will continue to discharge into the vegetated land to the south.
8.4 STAGE 3 AND 4 EXTRACTION AREAS

The upper most faces remaining in the extraction area will have been the subject of progressive rehabilitation efforts of the life of the quarry. The lower faces will have unsuitable product and overburden pushed into the toe of the face to reduce the overall face height. The new surface will have topsoil applied. ‘Hydromulch’ will be applied over this new surface to limit the water erosion that will take place in the first year of exposure.

The ‘hydromulch’ mix will have a combination of sterile annual grass seed and native plant seed. The sterile grass will rapidly germinate and secure the soil but die after the first season. The native seed will germinate in the protection provided by the dried grass thatch and establish to form robust and self-sustaining vegetation cover.

The remaining unsuitable material and overburden will be roughly placed over the main floor areas of the quarry. Any remaining topsoil will be distributed over this surface and a native seed mix broadcast over this medium.

8.5 PLANTING SCHEDULES

TABLE 13 PLANTING SCHEDULE QUARRY BENCHES REHABILITATION (CANOPY)

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
<th>Planting density</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Eucalyptus amygdalina</em></td>
<td>black peppermint</td>
<td>1 plant per 9 square metres</td>
</tr>
<tr>
<td><em>Eucalyptus obliqua</em></td>
<td>stringy bark</td>
<td>1 plant per 9 square metres</td>
</tr>
<tr>
<td><em>Eucalyptus viminalis</em></td>
<td>white gum</td>
<td>1 plant per 9 square metres</td>
</tr>
</tbody>
</table>

TABLE 14: PLANTING SCHEDULE QUARRY BENCHES REHABILITATION (MID STOREY)

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
<th>Planting density</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Arcacia dealbata</em></td>
<td>silver wattle</td>
<td>1 plant per 6 square metres</td>
</tr>
<tr>
<td><em>Bursaria spinosa</em></td>
<td>prickly box</td>
<td>1 plant per 6 square metres</td>
</tr>
<tr>
<td><em>Banksia marginata</em></td>
<td>silver banksia</td>
<td>1 plant per 6 square metres</td>
</tr>
<tr>
<td><em>Lomatia tinctoria</em></td>
<td>guitar plant</td>
<td>1 plant per 6 square metres</td>
</tr>
</tbody>
</table>

TABLE 15: PLANTING SCHEDULE QUARRY BENCHES REHABILITATION (UNDERSTOREY - GROUND COVER)

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
<th>Planting density</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Kennedia prostrata</em></td>
<td>scarlet runner</td>
<td>1 plant per 3 square metres</td>
</tr>
<tr>
<td><em>Poa labillardieri</em></td>
<td>Common tussock grass</td>
<td>1 plant per 3 square metres</td>
</tr>
<tr>
<td><em>Austrostipa nodosa</em></td>
<td>knotty speargrass</td>
<td>1 plant per 3 square metres</td>
</tr>
<tr>
<td><em>Austrostipa scabra</em></td>
<td>sickle speargrass</td>
<td>1 plant per 3 square metres</td>
</tr>
</tbody>
</table>
## 9 COMMITMENTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Commitment</th>
<th>When</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dust suppression measures will be employed to minimise workers exposure to dust and prevent a dust plume visible off site.</td>
<td>When required</td>
<td>Operator</td>
</tr>
<tr>
<td>2.</td>
<td>The existing sediment retention pond will capture runoff from the stages 3 and 4 extractions areas.</td>
<td>At all times</td>
<td>Operator</td>
</tr>
<tr>
<td>3.</td>
<td>Perimeter drains and sediment retention ponds will be cleaned out when their maximum capacity has been reduced to half or annually.</td>
<td>Annually</td>
<td>Operator</td>
</tr>
<tr>
<td>4.</td>
<td>Blasts of a similar scale to existing will occur up to a frequency of one per month.</td>
<td>Monthly</td>
<td>Operator</td>
</tr>
<tr>
<td>5.</td>
<td>Redundant equipment arising from the upgrade works will be removed from site.</td>
<td>On approval</td>
<td>Operator</td>
</tr>
<tr>
<td>6.</td>
<td>Diesel fuel required for site mobile equipment will be stored in a proprietary fully bunded 20 000 litre ‘Transtank’.</td>
<td>At all times</td>
<td>Operator</td>
</tr>
<tr>
<td>7.</td>
<td>The prescriptions of the original weed management plan will continue to be applied for the upgraded operation.</td>
<td>At all times</td>
<td>Operator</td>
</tr>
<tr>
<td>8.</td>
<td>Where recommended weed and disease hygiene protocols disagree actual works will comply with (DPIPWE, Mar 2015)</td>
<td>At all times</td>
<td>Operator</td>
</tr>
<tr>
<td>9.</td>
<td>Surveillance of wedge-tailed eagle behaviour will continue until the end of the 15-16 breeding season</td>
<td>Feb 2016</td>
<td>Operator / Zoologist</td>
</tr>
<tr>
<td>10.</td>
<td>The provisions of an Unanticipated Discovery Plan will be applied to any clearing of undisturbed areas.</td>
<td>At all times</td>
<td>Operator</td>
</tr>
<tr>
<td>11.</td>
<td>A safe and healthy workplace will be provided to workers and safety risks will be kept as low as reasonably practical</td>
<td>At all times</td>
<td>Operator</td>
</tr>
<tr>
<td>12.</td>
<td>The controls included in this Environmental Management Plan will applied to keep environmental risk to an acceptable level.</td>
<td>At all times</td>
<td>Operator</td>
</tr>
<tr>
<td>13.</td>
<td>A moratorium will be applied to ‘Hot Work’ on days of total fire ban</td>
<td>At all times</td>
<td>Operator</td>
</tr>
<tr>
<td>14.</td>
<td>If a bushfire threatens the site personnel will evacuate.</td>
<td>As required</td>
<td>Operator</td>
</tr>
</tbody>
</table>
10 Conclusion

The Long Hill Quarry is an important asset for future development within the north of Tasmania. The full potential of the operation is currently constrained by the permit conditions imposed on the original development.

The site has operated without incident since 2009 at the permitted rate of production. The Proponent has gradually invested in upgrading the equipment at the site to facilitate a more streamlined and efficient operation. The site is remote from sensitive uses, access is good and the existing controls can be applied successfully to an upgraded operation.

The Long Hill Quarry should be assessed at a new maximum production rate to enable future development in the north of Tasmania to proceed with access to high quality construction materials.

11 References


DPIPWE. (Mar 2015). Weed and Disease Planning and Hygiene Guidelines - Preventing the spread of weeds and diseases in Tasmania. Hobart: DPIPWE.


Shackcloth, B. (2016, February 1). email. (B. Williams, Interviewer)

12 APPENDICES
12.1 Appendix 1 - Sediment Retention Pond Calculations (ILMP)
12.2 Appendix 2 – Ecological Assessment Report (ECO Tas)
12.3 **APPENDIX 3 - WEED MANAGEMENT PLAN (BUSHWAYS)**
12.4 Appendix 4 – Wedge-tailed Eagle Management Plan (Mooney)
12.5 Appendix 5 – Hazard Analysis and Risk Assessment (ILMP)
12.6 APPENDIX 6 – TRAFFIC IMPACT ASSESSMENT (RJK CONSULTING)