Holcim

PAKENHAM QUARRY

ENVIRONMENTAL MANAGEMENT PLAN

Version 3 July 2021

UNCONTROLLED IF PRINTED

Paper copies of this EMP must only be issued by the Quarry Manager. Once printed the document however is uncontrolled.

This EMP contains references to other specified items such as Holcim SHE Guidelines, Attachments etc. These items will be made available on request to members of the ERC and to others on a needs basis as determined by the Quarry Manager.

This document has been developed from an original version prepared by EnviroRisk. All amendments to the original document have been made by Holcim internal employees.

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FOREWORD

This document is the Environmental Management Plan (EMP) for Holcim's Pakenham Quarry operations at Pakenham. The EMP forms an integral part of the Holcim overarching SHE Standards. It aims to provide Pakenham Quarry with guidance on operational, environmental, cultural, rehabilitation and monitoring management for the remainder of the site's life.

Holcim is committed to the EMP and will endeavour to make it a fundamental part of the sites daily activities.

Signed

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Nathan Thomas,
Operations Manager, Eastern Victoria Aggregates

SECTION A - ADMINISTRATION

1.0 INTRODUCTION

This Environmental Management Plan (**EMP**) has been designed for the Pakenham Quarry owned and operated by Holcim (Australia) Pty Limited

Pakenham Quarry is permitted to carry out quarrying (extractive industry) by planning permit T050156 (**Permit**) issued by the Cardinia Shire Council (**Responsible Authority**), and Work Authority 174 (**Work Authority**) issued under the Extractive Industries Development Act 1995 (**EIDA**) by the Department of Primary Industries (**DPI**).

This EMP has been prepared to satisfy the following requirements:

- Planning Permit Conditions 38, 39, 40, 42 & 43;
- DPI Work Authority No. 174;
- Environment Protection Authority Waste Discharge Licence DW903 (**EPA Licence**); and
- 'Net gain' requirements of the Department of Sustainability and Environment (**DSE**).

This EMP satisfies these requirements and contains the detail of the site's environmental management. Holcim conducts its operations within the framework of its national Safety Health and Environment Management system (**SHE**). The EMP is encompassed within that framework as shown in the following diagram (Figure 1). As such, some procedures and other documents within the SHE Standard will apply to the EMP – where this is the case they have been clearly cross-referenced in the EMP (and hyperlinked where the EMP is an electronic copy).

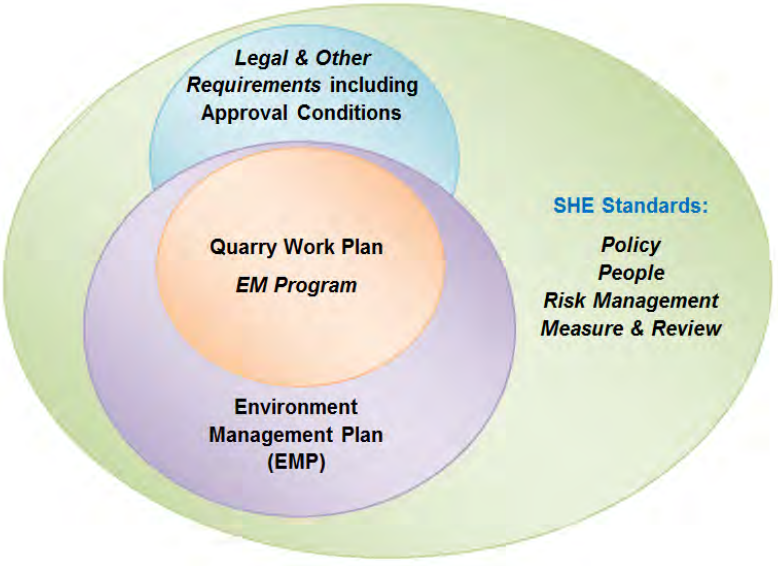


Figure 1: The Relationship between the EMP and Holcim's SHE System

The SHE system follows the philosophy of all modern management systems in that it uses a risk management based approach. Key components are the self-assessment protocols provided so that each site can review its operations and identify opportunities for continual improvement.

2.0 PAKENHAM QUARRY OPERATIONS

Holcim (Australia) PTY LTD, operates the Pakenham Quarry at Mount Shamrock Road, Pakenham, Victoria. The site is described (in the Permit and Work Authority) as part of the land described in Certificates of Title Volume 6312 Folio 290, Volume 9630 Folio 331, Volume 10677 Folio 901, Volume 8929 Folio 068.

The operation involves:

- Removal of soil and overburden and its storage for later use, including for progressive rehabilitation works;
- Extraction of basalt by drilling and blasting and its loading and transport to the processing plant;
- Crushing and screening of the rock into saleable product;
- Stockpiling, blending and sale of rock products on the site; and
- Off-site transportation of products by a variety of haulage vehicles.

An aerial photograph of the site is shown in Figure 2. The yellow coloured boundary is the extent of the land covered by the Work Authority, and the red boundary shows the extent of extraction.

Figure 2: Aerial View of Quarry, showing the Work Authority area and extraction limit.

The quarry operates under the following approvals:

- Cardinia Shire Council (Council), Planning Permit T050156 issued on 29th June, 2007;
- DPI Work Authority 174 (as amended); and
- EPA Licence No. DW903 issued 23rd November, 1979 (as amended).

Note: The above approvals apply to the land bound by the Work Authority. However, this EMP applies to all land owned by Holcim at this site, that is, the Work Authority area plus additional contiguous surrounding land.

2.1 SITE DETAILS

Location:	Mt Shamrock Road, Pakenham, Victoria
Access:	Mt Shamrock Road
Property Description:	Land described in Certificates of Title Volume 6312 Folio 290, Volume 9630 Folio 331, Volume 10677 Folio 901, Volume 8929 Folio 068.
Tenure:	Freehold
Zoning:	Green Wedge
Local Authority:	Cardinia Shire Council
Land Use:	Extractive Industry
Geology:	Basalt – Older Volcanics
Topography:	Undulating
Vegetation:	Mostly pasture with small areas of remnant woodland

2.2 HOURS OF OPERATION

As required by the Permit, the following hours of operation apply to quarrying operations:

No plant or extractive operations (except for maintenance) to take place:

(a) outside the hours 7:00am to 6:00pm Monday to Friday and 7:00am to 12 noon Saturday; or

(b) at any time on a Sunday or public holiday, except with the written consent of the Responsible Authority.

The loading of and/or cartage by vehicles must not commence before 7:00am on any day on which the operation is permitted.

Except with the written approval of the Responsible Authority, blasting is restricted to between the hours of 11:00am and 12:00 noon and between 2:00pm and 3:00pm Monday to Friday. No blasting is to occur on a Saturday, Sunday or public holidays.

If blasting is approved outside these times, notice must be given to all potentially impacted residents, to the satisfaction of the Responsible Authority (see EXTERNAL COMMUNICATIONS – Section 6.3 for further details).

3.0 ROLES & RESPONSIBILITIES

The responsibilities of quarry employees and contractors under this EMP ARE summarised in the table below

Role	EMP responsibilities
Quarry Manager (QM)	Overall implementation of EMP
	Quarry Development and Rehabilitation
	Net Gain Offset Management
	Cultural Heritage
	Reporting
	LRMP
	Ground & Surface Water
	Fire Prevention
	Dust Management
	Surface Water
	Slope Stability (Quarry and Toomuc Valley Slopes)
Production Manager (PrM)	Dust Management - stockpiles, fixed plant, stockpile area unpaved surfaces
	Traffic Management
	EPA discharge license compliance
	Control of Noise emanating from crushing/screening and sales activities
	Housekeeping
	Energy Efficiency (Fuel and electricity)
	Training
	Water efficiency
	Quarry Slope Stability
Quarry Supervisor (QS)	Blasting (inclusive of GHG from explosives)
	Control of Noise emanating from Pit during stripping/ rehabilitation activities
	Bushfire risk mitigation
	Housekeeping
	Energy efficiency (Fuel)
	Training
	Quarry Development

Quarry Slope Stability	
	EMP responsibilities
Maintenance Manager (MM)	All Fixed dust extractor / silo venting systems maintained
	All fixed plant dust suppression sprays maintained
	All fixed plant and earthmoving equipment maintained to OEM standards
	Maintenance of fire suppression systems both fixed and Mobile
	Housekeeping, waste segregation
	Energy Efficiency (electricity)
	Training
Maintenance Supervisor (MS)	Spill response equipment
	Hydrocarbon storage, waste segregation
	Maintenance of fire Extinguisher systems
	Workshop housekeeping, waste segregation
Weighbridge Operators (OP)	Maintain waste register for weighed loads
	Review trucks for materials on draw bars and tailgates
	Report on wheel wash operation
Mobile equipment Operators (OP)	Report any defects on mobile equipment
	Follow dust control procedures for stockpiles
	Operate machines in line with SWP and OEM standards
Fixed Plant Operators (OP)	Operate fixed plant in line with SWP inclusive of all dust mitigation controls
	Report any defects identified during plant checks

4.0 ENVIRONMENT REVIEW COMMITTEE (ERC)

An ERC has been formed by Cardinia Shire Council and comprises representatives of all key stakeholders including Holcim, Council, ERR and other State Government Authorities, and key stakeholders. The ERC is chaired by an independent person appointed by the Council. The ERC has been established, and will operate, under a procedure laid down by Council. Holcim will cover all the administrative costs of the ERC, including the fees of the Chairperson, and will provide secretariat services to the ERC.

The ERC will monitor and review the performance of the quarry against the Permit, the Work Authority and this EMP (as varied from time to time), provide advice and facilitate community understanding of quarry operations and their management.

5.0 TRAINING & AWARENESS

A copy of this EMP is to be kept and displayed in the foyer of the Quarry office. An electronic copy of the EMP can be provided to any Holcim-approved users on request.

- All new and current employees will be briefed on the EMP as part of their site induction and training systems.
- All employees will receive re-induction training every year.
- All contractors working at the site will be briefed on the EMP as part of the site induction system.
- Employees with specific key roles/responsibilities under the EMP will have their competency verified prior to being assigned to carry out those roles.

Records of training will be maintained within the SHE system.

Where no employees with suitable training are available to carry out specific key roles/responsibilities under this EMP, those roles/responsibilities will be carried out by suitably qualified persons or companies contracted by Holcim for that task.

Related documents:-

- SHE training guideline
- Site Training Plan
- SHE Induction Booklet
- SHE Induction Checklist

5.1 APPOINTMENT OF SPECIALIST CONSULTANTS

Personnel having responsibilities for carrying out monitoring activities as specified in the monitoring program will be trained and tested for their competence to carry out such activities, and certified as such, by a specialist in the relevant field. An *Appointment of Environment Training Specialists Procedure (Appendix 1)* has been developed for this process and approved by Department of State Development, Business and Innovation.

6.0 COMMUNICATION & REPORTING

Procedures have been developed for both internal (within Holcim) and external (between Holcim and external interested parties) communication and reporting. A separate procedure has been prepared to manage environmental complaints received from external parties such as members of the public and local residents.

6.1 INTERNAL COMMUNICATIONS

The SHE Guideline 1.03 'Communication, Consultation and Engagement' sets out details of communications within Holcim on environmental issues, which for Pakenham Quarry is through the site's Safety Improvement Team (SIT). The procedure describes how meeting outcomes are minuted and the minutes distributed to other employees. At SIT meetings environmental progress and performance under the EMP will be reviewed and discussed, and actions authorised.

Environmental issues will be raised with other employees at toolbox meetings which will be conducted as required. All toolbox meetings are recorded using the sites Prestart tool box talk form

6.2 INCIDENTS

All environmental incidents are to be reported, recorded and investigated in accordance with SHE Guideline 5.01 - 'Incident Reporting and Investigation'. The ICARE 2.0 incident database is to be used for reporting and recording details of each incident and the measures taken to resolve it. The system automatically forwards incident notifications through to management for completion. Every incident and the details surrounding it are available through ICARE 2.0 and are used by management for progress status and review purposes, and to compare against performance targets.

6.3 EXTERNAL COMMUNICATIONS

SHE Guideline 6.07 - 'Community Engagement' details how Holcim facilities are required to communicate and engage with the wider community regarding local issues. The site-specific Environmental Reporting Procedure (Appendix 2) specifies procedures for compliance reporting to the ERC and other stakeholders, and the frequency and nature of reporting of monitoring data, etc. Statutory reporting requirements such as those applying to the EPA Licence are also detailed in this procedure.

This procedure also details the steps to take in notifying residents living near the quarry when quarry activities are planned which have the potential for off-site impacts.

6.4 COMPLAINTS

A register of all complaints received is maintained as specified in Holcim's SHE Guideline 5.01 - Incident Reporting and Investigation. Any complaint received, or referred by a government agency, is directly and accurately recorded and managed in ICARE 2.0 which includes the provision for the following information:

- the date and time of the complaint received;
- the date and time of the event or nuisance forming the subject matter of the complaint;
- the detail of the subject matter of the complaint;
- the identity and address of the complainant (if provided); and
- any action taken in response to the complaint.

ICARE 2.0 can be accessed electronically at any time by authorised Holcim users to view any complaints received and the actions taken.

A full and up-to-date copy of the Complaints Register can be generated by ICARE 2.0 and will be made available to members of the ERC upon request.

A copy of all complaints received since the previous meeting of the ERC is to be provided to members of the ERC prior to each meeting of the ERC.

A sign has been erected and maintained at the approach to Pakenham Quarry that clearly shows to approaching persons the following information:

(a) a contact name with current phone, fax and email details for inquiries about quarry operations;
(b) a non-emergency out-of-hours contact number where out-of-hours inquiries are recorded; and
(c) an emergency out-of-hours contact number.

7.0 RECORDS RETENTION

Records that are generated as part of the EMP are to be managed according to QMS Procedure PN1.1 Control of Documents. This procedure specifies the identification, storage, protection, retrieval, retention and disposal of records required as part of this EMP.

8.0 AUDIT, REVIEW & VARIATIONS

The EMP will be audited annually by a suitably qualified Auditor (appointed under s.53S of the Environment Protection Act 1970). Holcim will appoint the independent Auditor who will:

1. Assemble an audit team with the appropriate qualifications;
2. Prepare an audit protocol which will fully describe the audit procedure;
3. Provide the Audit procedure to the ERC for comment prior to the audit, this may be modified in light of comments made by the ERC at the discretion of the Auditor.
4. Conduct the audit; and
5. Provide the audit report to quarry management for distribution to the ERC.

The scope of the EMP Audit will include:

- The actions taken in implementing the EMP
- The compliance with prescribed limits
- The environmental monitoring conducted against the environmental monitoring program.

8.1 PROCEDURE & PERSONNEL CERTIFICATION

All monitoring procedures that form parts of this EMP have been certified by an expert in the relevant field as being appropriate (see also 5.1 - Appointment of Specialist Consultants).

Personnel conducting monitoring measurements and inspections have been certified by a specialist in the relevant field as being competent (*see also .Appendix 1 - Appointment of Environment Training Specialists Procedure*).

8.2 EMP REVIEW

The EMP will be reviewed by Holcim every 5 years (or as otherwise required by the Responsible Authority). The review will be conducted in accordance with the quarry's EMP Review Procedure (Appendix 3).

8.3 EMP VARIATION

The EMP may be varied from time to time as changing circumstances require. All variations to the EMP must receive the written consent of the responsible authority. EMP variation will be conducted in accordance with the quarry's EMP Review Procedure.

9.0 MANAGER'S COMPLIANCE PLANNER

An Environmental Compliance Planner is prepared for the site each year and details the activities to be carried out on a monthly basis over the course of the specified 12 month period. This planner ensures that all environmental compliance obligations are met. Each activity in the planner is signed off upon completion, and the matrix is reviewed and if necessary revised if compliance obligations change during the 12 month period.

10.0 REFERENCES

1. Department of Primary Industries, 2010. Extractive Industry Work Plan Guideline. September 2010.
2. Department of Natural Resources and Environment (now Department of Primary Industries), 2001. Environmental Guidelines: Ground Vibration and Airblast Limits for Blasting in Mines and Quarries, v1.2.
3. EES technical reports, Technical Supplements Vols 1, 2 &3, Environment Effects Statement "Proposed Extension to Holcim Mt Shamrock Quarry, Pakenham", May, 2005.
4. Consent to Disturb, issued by the Wurundjeri Tribe Land & Compensation Cultural Heritage Council Inc., for sites AAV 7921-651 – Shamrock IA1, AAV 7921-678 – Shamrock IA2, AAV 7921-679 – Shamrock A3, AAV 7921-680 – Shamrock AS1, AAV 7921-681 – Shamrock AS2, and AAV 7921-697 – Shamrock IA4, 17th May, 2007.
5. Aboriginal Affairs Victoria, Guide to Preparing Aboriginal Cultural Heritage Management Plans, May, 2007.
6. DSE 2006. *Native Vegetation. Revegetation Planting Standards – Guidelines for establishing native vegetation for net gain accounting.* Department of Sustainability and Environment, Melbourne.
7. DSE, 2004. *Vegetation Quality Assessment Manual – guidelines for applying the habitat hectares scoring method, version 1.3,* October, 200

SECTION B – OPERATIONAL MANAGEMENT & MONITORING

1.0 OPERATIONS & IMPACTS

All significant environmental hazards and incidents are documented and recorded within the ICARE 2.0 electronic database. The hazards associated with each operation and activity carried out at the quarry, together with the corresponding actual or potential environmental impact(s) for each of the hazards are also available for viewing by all authorised personnel. SHE standard control procedures are generic and apply to all Holcim aggregates site, whilst the site specific controls apply to Pakenham Quarry alone.

2.0 MANAGEMENT OF SIGNIFICANT ENVIRONMENTAL HAZARDS

This section details:

- Methods of operation and management measures required to be adopted to manage potential environmental impacts; and
- Protective and mitigating measures to be implemented to manage the sites significant environmental hazards (aspects).

2.1 AIR QUALITY – DUST

2.1.1 OBJECTIVES

To prevent dust emissions from the Pakenham Quarry operation from causing a nuisance at residences or sensitive sites within the surrounding area.

To ensure that dust levels do not adversely impact on the health and amenity of persons in the surrounding area.

2.1.2 TARGETS

100% Compliance with Permit requirements, namely the following levels to be achieved at any residence or other sensitive site:

- PM10 no greater than 64 g/m3 (Reactive monitoring)
- Dust deposition no greater than 4g/m3/month (no more than 2g/m3/month greater than background)
- No (0) justified complaints from sensitive receptors.

2.1.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Unpaved Surfaces	Dust emissions from unpaved surfaces are to be controlled using the following measures: ● Wet suppression - all dust generating areas such as site roads will be watered, as required, to suppress dust during operation.	Dust Management Procedure (Appendix 5)	QM	As required
	● Water used for dust control may be dosed where appropriate with dust control additives to enhance stabilisation and reduce water use.		QM	As required

	• Relevant operations will be suspended if adequate water cannot be applied for dust control.		QM	As necessary
	• Revegetation of exposed surfaces, including the following measures: • Vegetation and topsoil removal will be limited to the smallest practicable area and revegetated as soon as possible following clearance; • Soil stockpiles will be allowed to self-seed when left for extended periods of time; • The extent of areas prone to erosion will be restricted wherever possible; • Exposed surfaces will be rehabilitated in a timely manner in accordance with the Landscape Rehabilitation and Management Plan (LRMP). • Where revegetation or minimal land exposure is limited by procedural requirements, chemical (dust) suppression methods may be used.	LRMP (Appendix 6)	QM	During clearing All times All times LRMP As required
Unregistered earth Moving Machinery Vehicles	• On days of unfavourable conditions, a review of on-site practices will be undertaken to identify actions that can mitigate dust generation.	Dust Management Procedure	QM	As necessary
	• Unpaved roadways will be watered on a needs basis during load and haul activities to minimise dust from vehicle movement.		PrM	As necessary
	• When moving stock, load sizes will be managed to avoid spillages.		Operators	All times
	• Speed limits will be defined and communicated to all machinery operators. Where necessary speed limits will be enforced by quarry management		PrM	All times
Road Registered Vehicles	• Paved/sealed roadways within the quarry will be maintained in a clean state to minimise dust from vehicle movement.		PrM	As necessary
	• All road registered vehicles that cart quarried materials shall be covered by suitable tarpaulins or		Operators	All times

	enclosed blinds prior to leaving the quarry and entering public roadways.			
	• All road registered vehicles delivering quarry products or additives to or from the site, will pass through the wheel wash facility prior to leaving the quarry and entering public roadways.		Operators	All times
	• Roadways immediately beyond the site entrance will be regularly inspected and swept to prevent the build-up of material.		PrM	As necessary
	• Travel distances will be minimised through appropriate site layout and design.		All staff	All times
	• Vehicle movements will be restricted to defined areas.		PrM	All times
	• Speed limits will be defined and communicated to all vehicle drivers. Where necessary speed limits will be enforced by quarry management.		PrM	All times
Material Stockpiles	Dust emissions from stockpiles will be mitigated where required to ensure targets are met by: • Wet suppression using sprinklers or watercart sprays • Covered storage of fine material; • Limiting the height and slope of the stockpiles; • Limiting drop heights from conveyors; and • Use of wind breaks.	Dust Management Procedure	PrM, Operators	As required
Conveyors	Dust emissions from conveyors will be minimised by: • Minimising drop heights; and • Appropriate design of hopper load systems to ensure a good fit with trucks, and use of appropriate enclosures for hoppers.	Dust Management Procedure	PrM	All times

Material Handling	Dust emissions during material handling will be minimised by: • Minimising drop heights; • Regularly cleaning up any spillages; and • Appropriate design of hopper load systems to ensure a good fit with trucks, and use of appropriate enclosures for hoppers.	Dust Management Procedure	PrM Operators	All times
Reporting	• All site personnel will be instructed to immediately report situations resulting in elevated dust emissions to the manager (or their supervisor).	SHE Induction Booklet	PrM	All inductions
Monitoring	• Monthly monitoring of dust deposition.	EMP section.2.1.	QM	All times
	• Records of wind speed and direction will be stored on or off site for a period of 12 months. If the records are stored off site, the data must be readily available to the site for analysis by the site personnel or their representatives in the case of complaints and to assist in interpreting dust monitoring data.		PrM	All times
	• Dust emissions and potential dust generating activities and areas will be monitored visually during quarrying activities.		All staff	All times
	• Analysis and reporting of dust samples for compliance will be undertaken by an experienced entity independent of the operator.		PrM	As required
	• Community complaints will be monitored during works to assess the operations against objectives and targets.		PrM	All times
	• All data is reviewed by an external consultant. In the event of any exceedances the site is notified immediately and relevant data is forwarded to the Quarry Manager.		PrM	monthly
Reporting	• One (1) hourly average PM_{10} data will be provided to the Pit Manager's office from the 'reactive monitoring stations'.		PrM	All times

	• All complaints are to be recorded in the ICARE 2.0 electronic database	SHE Guideline 5.01 - Incident Reporting, and Investigation	PrM	All times
	• All communication is to be undertaken as per the SHE Communication Procedure.	SHE Guideline 1.03 - Communication, Consultation and Engagement	All staff	All times
	• Monitoring data is to be provided to the ERC as per the Environmental Reporting Procedure.	Environmental Reporting Procedure	QM	As required
Corrective Action	• Dust generating activities will be controlled by watering or other means to achieve compliance targets based on reactive monitoring data, visual observation or staff feedback.	Dust Management Procedure	QM	All times
	• If necessary, dust generating activities will cease until corrective actions result in achievement of targets or wind conditions are such that targets are achieved.		QM	As required
	• The site Incident Management procedure will be followed to rectify all reported dust incidents.	SHE Guideline 5.01 – Incident Reporting, Recording & Investigation	PrM All staff	All times

21.4 MONITORING SCHEDULE (Initial 12 Months from Commencement of Quarry Extension)

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Dust Monitoring.	Deposition	Technical Officer	Monthly	AS/NZS 3580.10.1:2003 Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method	Dust deposition 4g/m^3/month (no more than 2g/m^3/month greater than background)
A series of locations near sensitive receptors identified based on EPA discussions. (Refer Appendix 11 - Monitoring Schedule for locations 4x Reactive monitors will be used across any of the Air monitoring locations specified.	Airborne Dust (PM_{10}) as ⌠g/m^3	Quarry Manager	Continuous whilst quarry in operation	Real time dust monitoring with data logger and hourly averages. As there is no standard specified. A portable *DustTrak/ Osiris/ Airmetrics* type unit will be employed.	PM_{10} (1 hour ave.) – 64 ⌠g/m^3 *(ie 80% of the SEPP AQM criteria of 80 ⌠g/m^3 to enable reactive management of dust emission)*
Weather Station	Wind speed and direction	Technical Officer	Continuous (hourly averages)	Wind Velocity: AS 2923-1987, Guide for the Measurement of Horizontal Wind for Air Quality Applications	N/A

Note: Personal respirable dust monitoring is not within the scope of this EMP.

2.2 NOISE

2.2.1 OBJECTIVE

To prevent noise from the Pakenham Quarry causing nuisance/annoyance to persons at noise sensitive sites in the surrounding area.

2.2.2 TARGETS

Compliance with the noise restrictions specified in the Permit, namely noise emanating from operations on the site, other than noise associated with blasting activities, must not exceed 45dB(A) L_{Aeq} measured at the nearest sensitive site outside Holcim site boundary.

Noise emanating from works associated with the construction of noise attenuation mounds is exempt from this limit except that it must not exceed 68dB(A) L_{Aeq} at any time.

2.2.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Acoustic & other works	● Extra acoustic measures will be implemented when excavation activities occur within 10m (vertical) of the quarry extractive limit, eg. bunding along the perimeter of the works area.	Noise Management Plan (Appendix 7)	QM	As required
	● Regular preventative maintenance (PM) is performed on mobile equipment to reduce unnecessary vibrations and rattles.	Quarry PM Schedules	MM	As required
Monitoring	● Monitoring of community complaints will be undertaken during the extraction works to assess achievement of the objectives and targets, as required.	Environmental Complaints Register in ICARE 2.0	PrM	During works
	● Monitoring of noise at noise sensitive locations will be undertaken as per the Monitoring Schedule.	EMP Section.2.2.4	PrM	As per Schedule

	● Monthly Housekeeping inspections will be carried out to assess noise conditions and the effectiveness of preventative measures.	SHE Attachment 6.02A – Environmental Hazard inspection worksheet	PrM	Monthly
Reporting	● All complaints are to be recorded in ICARE 2.0.	SHE Guideline 5.01 - Incident Reporting, Investigation.	QM, PrM All staff	As required
	● All internal communication to be undertaken as per SHE Guideline 1.03 – Communication, consultation and engagement	SHE Guideline 1.03 – Communication, consultation and engagement	All staff	As required
	● Monitoring results will be kept in the office of the QM and be made available for inspection at reasonable notice during normal working hours.		QM	
	● Monitoring data will be provided to ERC in accordance with the Environmental Reporting Procedure.	Environmental Reporting Procedure	QM	Quarterly
Corrective Action	● In the event that noise from site operations is above 45 dB(A) L_{Aeq} as measured according to SEPP N-1 at a sensitive site, strategies for noise abatement will be developed and implemented to achieve compliance.		QM	As applicable

2.2.4 MONITORING SCHEDULE

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criterion
Routine noise monitoring at closest sensitive receptors surrounding the quarry. (see Appendix 11 – Environmental Monitoring Schedule)	Noise level at all Monitoring Locations	Technical Officer	Fortnightly	State Environmental Protection Policy (Control of noise from commerce industry and trade) No. N-1 1989 (as amended)	Day 0700-1800hrs 45 dB(A) L_{Aeq}
Periodic noise monitoring at commencement of change in quarry activities e.g. near surface extraction.	Noise level at all Monitoring Locations	Technical Officer	Daily until consistent compliance obtained (compliance for 2 consecutive weeks)	State Environmental Protection Policy (Control of noise from commerce industry and trade) No. N-1 1989 (as amended)	Day 0700-1800hrs 45 dB(A) L_{Aeq}
Periodic noise monitoring during noise attenuation mound construction works	Noise level at all Monitoring Locations	Technical Officer (independently certified)	Daily during mound works	State Environmental Protection Policy (Control of noise from commerce industry and trade) No. N-1 1989 (as amended)	Day 0700-1800hrs 68 dB(A) L_{Aeq}
Monitoring in response to a "justified complaint"	Noise level at Complainant's Residence	Technical Officer (independently certified)	As required	State Environmental Protection Policy (Control of noise from commerce industry and trade) No. N-1 1989 (as amended)	Day 0700-1800hrs 45 dB(A) L_{Aeq}

Note: Personal noise exposure monitoring is not covered in this EMP.

2.3 BLASTING

2.3.1 OBJECTIVE

To ensure that vibration from blasting operations is controlled to comply with ERR environmental guideline limits for new operations.
To ensure that blasting operations generally are conducted in a manner that minimises the risk of adverse environmental impact.

2.3.2 TARGETS

100% compliance with ERR environmental guideline limits for new operations.

2.3.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Blasting Operations	Blasting will be carried out in general accordance with the SHE Guideline 3.14 – Blasting & Explosives, and in strict accordance with the Blast Management Plan, WA5.4.067.V.PAK (Appendix 8).	SHE Guideline 3.14 – Blasting & Explosives; Blast Management Plan, WA5.4.067.V.PAK	QM	All blasting events
	• Except with the written approval of the Responsible Authority, blasting will be restricted to between the hours of 11:00am and 12:00 noon and between 2:00pm and 3:00pm Monday to Friday. No blasting will occur on a Saturday, Sunday or public holidays. If blasting is approved outside these times, notice must be given to all potentially impacted residents, to the satisfaction of the Responsible Authority.	Planning Permit T050156 Clause 13	QM	All times

	Monitoring	Air and ground vibration resulting from blasts will be measured at the nearest sensitive sites to the extraction area, or some other convenient location that will permit the vibration at the nearest sensitive site to be reliably estimated. ● The current monitoring locations (see Figure 1 in the Monitoring Schedule) namely the quarry office (V1), the north-east corner (V2), Toomuc Valley Road (V3) and Waterhouse property (V4) will continue to be used to assess blast noise and vibration.	EMP Section.2.3.4	QS	All blasting events
		● Vibration measurements will be monitored. In the event that the vibration measurements indicate that the 95% ERR regulatory guideline limits may be exceeded in future blasts, the blasting specification and shot-firing practice must be reviewed and modifications made, as appropriate, to ensure continuing compliance.		QS	Where vibration measurements indicate future exceedance may occur.

2.3.4 MONITORING SCHEDULE

Site	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Monitoring Stations V1, V2,V3 and V4 (refer Appendix 11 – Environmental Monitoring Schedule) or as directed by an Inspector.	Peak Particle Velocity (PPV) (Ground Vibration) Air Blast (Air Vibration)	Specialist Consultants Specialist Consultants	Every blast Every blast	Department of Primary Industries, Environmental Guideline - Ground Vibration and Airblast Limits for Blasting in Mines and Quarries v1.2, 2001	PPV 5mm/sec for 95% of blasts in 12 Month period. Peak Airblast of 115dBL for 95% of blasts in 12 Month period.

2.4 SURFACE WATER, DRAINAGE, & GROUNDWATER

2.4.1 OBJECTIVE

To minimise any potential impact on receiving waters.
To progress water management such that any discharge to surface waters is during periods of very high rainfall only.
To ensure that water discharged from the Quarry does not affect the beneficial uses of the receiving waters.
To assess any long term trends in groundwater levels.

2.4.2 TARGETS

100% compliance with the requirements of the EPA Licence.
100% conformance with groundwater level monitoring requirements.

2.4.3 MANAGEMENT MEASURES

The site surface water management system is summarised diagrammatically in Figures 4 & 5 below.

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Water Quality monitoring	• Discharge of water from the site will be managed and monitored (for both quality and discharge volume) in accordance with the current revision of the EPA Licence.	EPA Licence	QM	All times
Pond Sediment Removal	• Sediment in the settlement ponds is removed at least once every 12 months and stockpiled within other areas of the quarry.	-	PrM	Every 12 months

Algae Management	• Algae will be controlled by:
	  • maintaining flowing water across ponds and Donazzan's Dam,
	  • minimising nutrient input, eg. by maintaining a septic tank pump out frequency of at least once a year,
	  • maximising nutrient uptake, discharge or isolation from the water column,
		-	PrM	All times

	• maximising dissolved oxygen levels by circulating water, • ensuring water bodies receive sufficient water to provide regular and significant overflows, • ensuring water bodies have no stagnant zones, and that all sections of the water bodies are subject to flowing water when rainfall enters the system,, • managing the catchment areas directly upstream of Donazzan's Dam to reduce the amount of nutrients entering a water body, and • reviewing ponds and dams to evaluate and act to avert potential stagnant areas.			
	In the event of algal bloom(s); • Water body flushing to break up and inhibit algal growth, and dissolved air flotation and surface skimming to remove algal mass, will be considered as short term remedial measures, • a specialist will be engaged to assist with treatment and removal, • records will be kept of all such occurrences to help determine likely trends that could assist in future water body management, • chemical treatments (eg. use of herbicides/algicides) will only be used as a last resort measure if required, and then only with prior approval from the relevant government agency (for water bodies situated on existing creeks).	-	PrM	As required
Source Controls	• The plantings undertaken as part of the water quality management system will be maintained in accordance with the Landscape and Rehabilitation Management Plan (eg weed control, plant replacement).	LRMP	PrM	All times

	• Areas of vegetation disturbance and ground cover shall be minimised during opening up of new operational areas to prevent erosion.	(See s.2.1.3 of EMP)	PrM Operators	During initial clearing
	• Clearing and construction activity associated with the development of the site shall be carried out in accordance with "Construction Techniques for Sediment Pollution Control" EPA Publication No 275 (as amended).	-	PrM Operators	All times
	• Soil stockpiled for later rehabilitation works will be stored in mounds no greater than 2m high and contoured and grassed to minimise erosion. Mounds will be constructed and located to minimise any visual disturbance and to avoid contamination with other materials.	-	QM Operators	As required
	• Overburden will be stored in worked out areas of the excavation for later use in rehabilitation, or sold or used to rehabilitate final faces when terminal faces are available. Overburden storages will be constructed to control drainage and maintain stability.	-	QM Operators	As required
	• Diversion drains will be provided around the top of the quarry and workings to direct surface run-off away from operational areas.	-	QM Operators	As required
	• Channelling of water flow (rill formation) will be minimised and any channel flows stabilised.	-	QM Operators	As required
	• Where practical, erodable areas that remain bare and undisturbed for long periods (i.e. greater than 2 months) will be stabilised by covering with mulch, anchored fabric or topsoil covered and seeded with Sterile Rye grass.	-	QM Operators	As required
Triple Interceptor	• The dual triple interceptor system treating washwater from the plant and equipment wash down pad will be regularly maintained in effective working condition.	PM Schedules	MM	As required

Groundwater Level Gauging (external)	• Water level gauging will be conducted quarterly, and an annual evaluation undertaken, to determine how the groundwater levels respond to the following: • Seasonal rainfall changes; • Extension of the quarry; • Revegetation to parts of the plateau surface; and • Progressive rehabilitation of quarry.	External consultant	QM	Quarterly
Groundwater Level Gauging (internal)	• Monthly water level gauging (MB01 – MB06) will be conducted by site personnel	Internal	QM	monthly
In Pit water levels	• Quarterly recording of water levels of in pit dam levels	Internal	QM	Quarterly
Groundwater Beneficial Use Assessment	Properties surrounding the quarry will be regularly assessed to confirm that the assessed beneficial uses of groundwater in accordance with section 15 of the SEPP (Water) on the properties is supported by actual practices	External consultant	QM	Annual

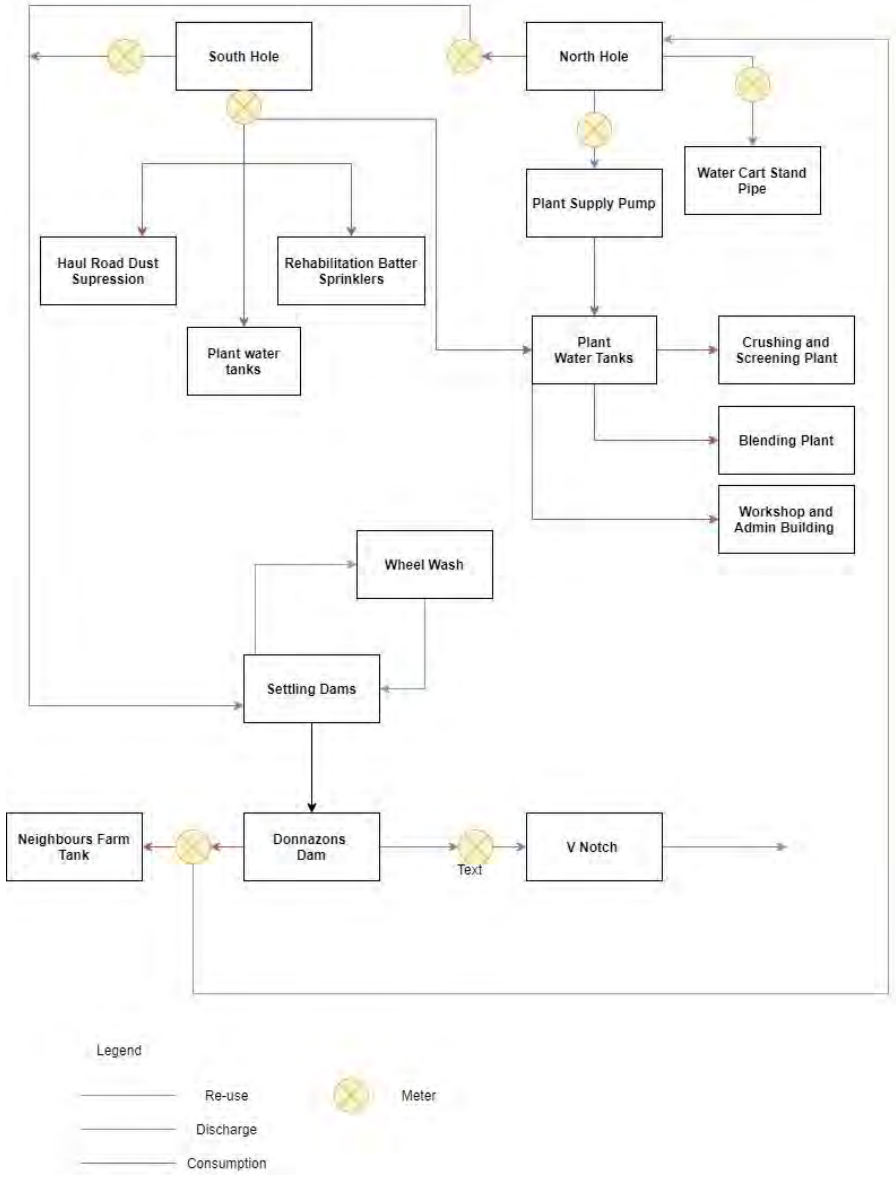


Figure 4: Quarry Water Management System - Transfer and Re-use Activities

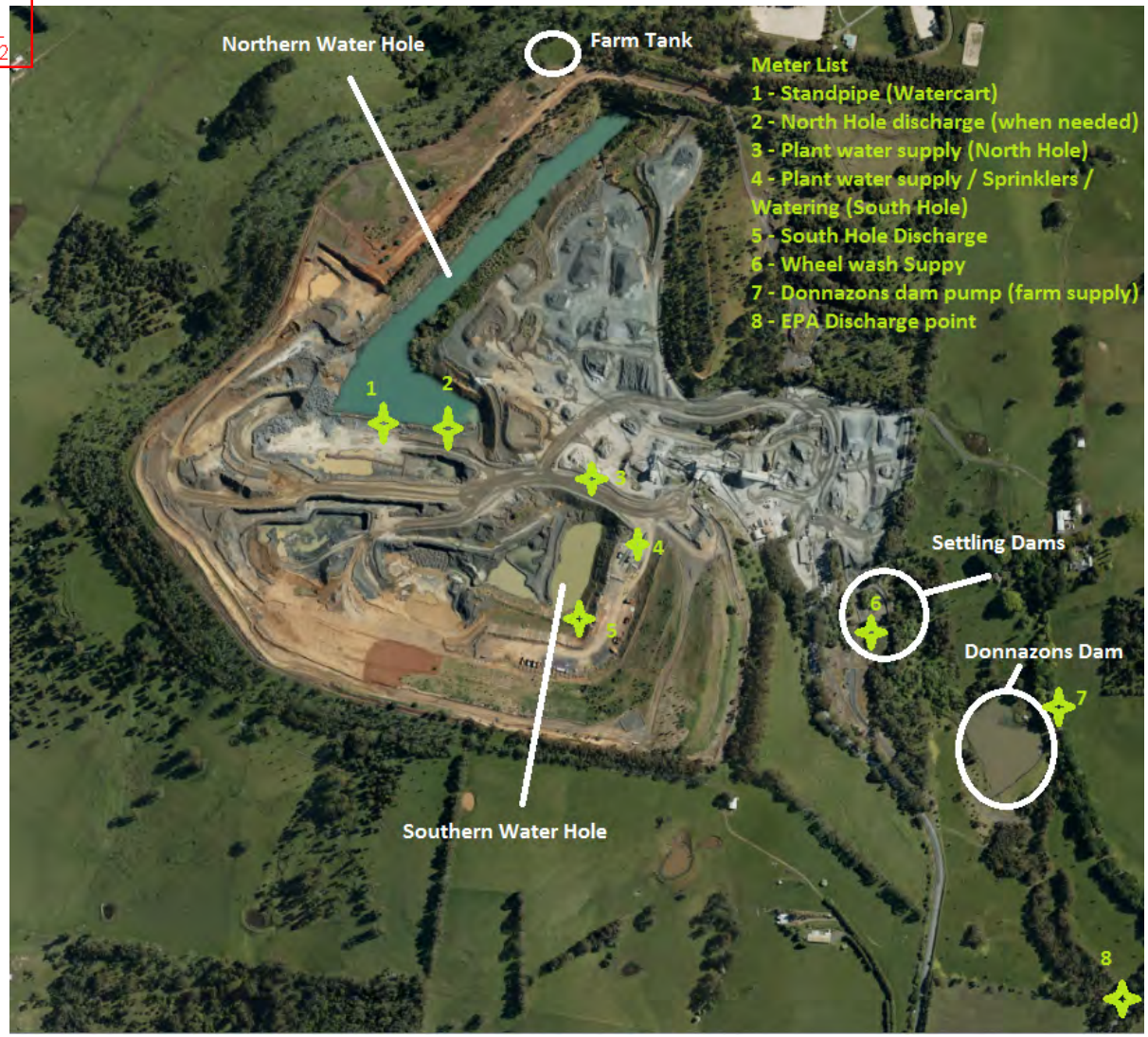


Figure 5: Quarry Water Management System Overview

2.4.4 MONITORING SCHEDULE

Item / Location	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Dams #1 and #2	Visual Inspection for sedimentation and algae.	Technical Officer (independently certified)	At least monthly	Direct Observation	N/A
Settlement Ponds #1 and #2	Visual Inspection for sedimentation and algae.	Technical Officer (independently certified)	At least quarterly	Direct Observation	N/A
Donazzan's Dam	Visual Inspection for spillway erosion, sediment build-up, algae or other objectionable matter.	Technical Officer (independently certified)	Following storm events	Direct Observation plus photo record if changes or damage evident	Non eroding spillway
V-notch Weir	Flow Rate (Volume, time, date and duration of each discharge event)	Technical Officer (independently certified)	Continuous whilst discharge occurs	Standard Spreadsheet calc.	Annual Volume (TBD by EPA)
EPA Sampling Point	As per the requirements set out in the current version of the EPA Licence. Visible floating oil, grease, scum, litter or other objectionable floating matter	Technical Officer (independently certified)	Weekly during discharge	EPA Licence Conditions; Certified Procedure	EPA Licence Conditions (Maximum)
Monitoring Bore MB01 to MB06	Level Gauging (Standing Water Height)	Quarry Personnel or Specialist consultant / technical officer	Quarterly (January, April July, October)	AS5667.11:1998 or similar	Plot trends and any significant changes in groundwater levels, report in Site Environmental Management Program
Monitoring Bore MB01 to MB06	Level Gauging (Standing Water Height)	Quarry Personnel	Monthly	Direct observation	N/A
Pit water levels	Standing water levels	Quarry Personnel	Quarterly	Direct Observation	N/A

2.5 SLOPE STABILITY

2.5.1 OBJECTIVE

To ensure slopes both outside and within the Quarry are as stable as possible to minimise the risk of landslip.

2.5.2 TARGET

No avoidable landslips.

2.5.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Natural Slopes (outside Work Authority boundary)	• Any indications of slope instability such as cracking, heaving or settlement, increased areas of seepage or any other unexpected movement will be referred to a geotechnical specialist for advice.	-	PrM	As required
	• Regular visual monitoring of the slopes in Toomuc Valley on land owned by Holcim will be conducted.	(See s.2.5.4 of EMP)	PrM	As specified in Monitoring Schedule
	• Monitoring of the condition of any vegetation or new drainage and replanting or repairs will be undertaken as necessary as part of Landscape and Rehabilitation Management Plan.	LRMP	PrM	As specified in Monitoring Schedule
Quarry Slopes (inside the Work Authority boundary)	• The progressive excavation will require on-going rehabilitation activities to control erosion, and then make all the earthworks safe and compatible as possible with the surrounding landscape. Construction and	-EES - Work Plan.pdf	QM	As required

	revegetation will be undertaken in accordance with consultants reports and requirements as per the site Work Plan.			
	• The rehabilitated slopes will require construction of internal and surface drainage, vegetation establishment, fill compaction, trial sections, development of technical specifications under the guidance of a geotechnical specialist and reviewed with the ERR in accordance with the Work Plan Landscape and Rehabilitation Report specifications.	-	QM	As required
	• Regular visual monitoring of all slopes including any rehabilitated slopes, overburden stockpiles and operating faces will be conducted and if any change in the slope conditions (such as cracking, heaving or settlement of the quarry walls or floor, increased areas of seepage or any other unexpected movement) is observed, specialist geotechnical advice will be sought.	Direct observation	PrM	As specified in Monitoring Schedule

2.5.4 MONITORING

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria#
Overburden Stockpiles, Crushed Stockpiles and Operating Faces	Visual inspection for changes in seepage conditions, cracking, movement (bulging or slips)	Technical Officer (independently certified)	Six monthly (or at completion of overburden placement or removal) After heavy rain	Direct Aerial Observation Walk-over	N/A
Rehabilitation of Operational Areas	Visual inspection for changes in seepage conditions, cracking or movement (bulging or slips)	Technical Officer (independently certified)	Annually	Direct Observation	N/A
Land Slips – Toomuc Valley, general	Visual Inspection of vegetation planting, spring and land surface stability	Technical Officer & specialist consultants	Six monthly & after heavy rain	Direct Observation	N/A
Land Slips – Toomuc Valley, general	Visual Inspection of spring	Technical Officer & specialist consultants	Six monthly & after heavy rain	Direct Observation	N/A
Land Slips – Toomuc Valley, closest to blast		Technical Officer (independently certified)	Following each blast		N/A
New Planting or drainage works	Visual Inspection of vegetation planting and land surface stability	Technical Officer (independently certified)	Within 6 months following works	Direct Observation	N/A

- subjective assessment by competent person to determine landslip risk significance .

2.6 GREENHOUSE GAS EMISSIONS

2.6.1 OBJECTIVE

To minimise greenhouse gas (GHG) emissions resulting from quarry works and operations.

2.6.2 TARGETS

Achieve combined reduction targets of 3% of combined emissions from Electricity, Fuel and Explosives

2.6.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
	● Aim for continuous improvement of GHG intensity of production by identifying and controlling energy intensive processes as part of Holcim SHE element 6.04 Energy Efficiency'		QM	All times
	● Regular monitoring and NGER reporting of energy use and GHG emissions.		QM	As required
	● Review and further evaluation of all transportation within the quarry against current internal regional fuel efficiency benchmarks;		QM	As Required
	● Incorporate energy and GHG awareness into training of managers and supervisors.		QM	All times

2.6.4 MONITORING

Overall reduction target of 3% in CO_2 – e (t) for combined fuel, electricity and explosives usage.

Item	Test	Responsibility	Frequency	Assessment Methodology
Fuel usage	-	QM	Annual	Usage per tonne
Electricity usage	-	QM	Annual	KWh per tonne
Explosives usage	-	QM	Annual	Tonne per tonne

In the event during the reporting period, the operation can not meet its reduction targets through process improvements, Holcim can engage or participate in a government approved offset arrangement. For example, additional renewable energy purchase. Verification of participation will be provided to the ERC for review.

2.7 TRAFFIC MANAGEMENT

2.7.1 OBJECTIVES

To minimise the impact of quarry traffic on the local amenity.

2.7.2 TARGETS

Compliance with (or completion of) all actions specified in the s.2.7.3 of this EMP.

2.7.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Materials from Trucks falling onto Roadways	• The wheels of all trucks leaving the site must be clean before trucks travel onto any part of the public road network. • All trucks delivering quarry products leaving the site will be cleaned by passing through the wheel and truck wash facility at the main gate (see s.2.1.3 of EMP).	Vehicle/wheel wash procedure	PrM All operations staff Contractors	All times
	• All vehicles carrying materials from the site must be loaded and transported in a manner which prevents spillage of materials onto a public road.	-		
Truck Movements	• Early morning truck movements are to be scheduled to avoid queuing outside the boundary of the site.	Site Specific Quarry Rules in SHE Guideline 3.04	PrM	All times
	• All vehicles associated with quarry activities, including trucks and machinery, must enter and exit the site via Mt Shamrock Road.		Contractors	

2.7.4 MONITORING

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Truck wheels clean before entering public roadways	Visual inspection – wheels and roads	PrM	Monthly	Housekeeping check[+]	No dirt tracked onto public roadways
Spillage of materials from vehicles leaving site	Visual inspection – vehicles and roads	PrM	Monthly	Housekeeping check[+]	No materials spilled onto public roadways
Truck queuing during early morning movements	Visual inspection – vehicles	PrM	Monthly	Housekeeping check[+]	No queuing of trucks during early morning movements (pre-7:00am)
'*Trucks avoid using engine brakes on Mt Shamrock Road*' signage	Visual inspection	PrM	Monthly	Housekeeping check	Sign is clearly visible to truck drivers leaving the quarry.

Note: + - any daily noted excursions are to be recorded within the incident register.

2.8 NET GAIN MANAGEMENT PLAN

2.8.1 OBJECTIVE

To provide vegetation that offsets the loss of vegetation associated with the Quarry and provides a net gain of Habitat Hectares.

2.8.2 TARGETS

Establishment of vegetation in accordance with the Native Vegetation Management Framework and the Net Gain Offset Management Plan (NGOMP, Biosis Research, September 2007 – Appendix 9) by January 2009 (as specified in the s.173 Agreement)

2.8.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Plant Maintenance	● Plantings that do not survive will be replaced.	NGOMP	QM	As required
	● Supplementary watering of plantings will be carried out as required and permitted by prevailing water restrictions.		QM	As required
	● Weed (including identified woody weed) control works will be conducted on a monthly basis during the primary weed season (June to December inclusive) and at other times as required.		QM	Monthly during June-December
Fire prevention	● Maintain fire breaks during bushfire season		QM	Declared (by CFA) Bushfire season
	● Preventative inspections for fire hazards		QM	Declared (by CFA) Bushfire season

2.8.4 MONITORING

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Bushfire prevention inspections	-	QM	Monthly during declared bushfire season	Completion of checklists and actions recorded in ICARE 2.0	Completion of checklists and actions recorded & closed out in ICARE 2.0

2.9 CULTURAL HERITAGE

2.9.1 OBJECTIVE

Preserve, by relocation, all items of cultural heritage identified in accordance with Wurundjeri 'Consent to Disturb' ("Consent") conditions.

2.9.2 TARGETS

100% compliance with Consent conditions.

2.9.3 MANAGEMENT MEASURES

All items required under section 2.9 are completed and noted in appendix 14

2.10 FIRE MANAGEMENT

2.10.1 OBJECTIVE

To ensure that the risk of fire is minimised.

2.10.2 TARGETS

No fires.

2.10.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Fire Prevention Works	• Undertake annual on-site fire prevention works, prior to the declaration of the "Fire Danger Period", in consultation with the Responsible Authority and the local Country Fire Authority.	-	PrM	Annually
Vehicle Access	• Access for all emergency vehicles will be provided and maintained at all times through the site.	-	QM	All times
Equipment	• Fire prevention and response equipment will be provided and maintained in accordance with the Holcim Emergency Response Procedure and Quarry Emergency Procedures flip chart.	SHE Guideline 1.07 –Emergency Response, First Aid and Injury Management	MM	All times

2.10.4 MONITORING

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Fire/evacuation drill	Fire/evacuation alarm sounded without prior notice	QM	Annually	Quarry Emergency Procedures flip chart	All personnel safely evacuate in timely manner
Smoke detectors	Detector sounded (battery replaced)	MM	6 monthly	Manufacturer's specification	All units fully operational
Fire prevention works	Inspection	PrM	Annually prior to "Fire Danger Period"	Visual observation	Completed as agreed with Responsible Authority/CFA
Fire fighting equipment - mobile	Equipment fully operational	MM	6 monthly	Manufacturer's specification	No faults
Fire fighting equipment - other	Systems and equipment fully operational	MM	AS1851	AS1851 – Maintenance of fire protection systems and equipment	No faults/failures

2.11 WATER CONSERVATION

2.11.1 OBJECTIVE

To conserve potable water supplies.

2.11.2 TARGETS

Implement measures to reduce the use of mains water supply.

All items required under section 2.11 are completed and noted in appendix 14

2.12 WASTE MANAGEMENT & MINIMISATION

2.12.1 OBJECTIVE

Minimise waste quantities, comply with legislative requirements and progress towards the recycling and re-use of all wastes.

2.12.2 TARGETS

Establishment of quantifiable and achievable waste reduction targets by December 2007.
All recyclable wastes removed from waste stream to landfill by June 2008.

2.12.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Waste Minimisation	● Characterise all waste streams and develop measures to: ● minimise site waste generation; ● segregate waste groups; and ● direct landfilled wastes to recycle/re-use wherever possible	SHE Guideline 6.31 - Waste Management	QM	Complete
	● Develop quantifiable and achievable targets for the reduction of waste volumes for each of the identified waste groups, and the measures to be taken to achieve the targets.	-	QM	Complete
	● Sediment in the settlement ponds is removed at least once every 12 months and stockpiled within other areas of the quarry.	-	PrM	Annually
	● All prescribed industrial waste (PIW) such as waste oil is to be stored, and transported from the site, in accordance with EPA prescribed waste transport guidelines (references 7 & 8)	EPA PIW Guidelines	MM	As required

	• The site's septic sewage system will be pumped out regularly.	-	QM	Annually
Monitoring	• Conduct an annual waste survey to establish the types, quantities and recycling/ re-use percentages for all site wastes.	-	QM	Annually
	• Use the outcomes of the annual survey to set quantifiable and achievable annual waste reduction targets for the site for each waste stream identified.	-	QM	Annually

2.13 HOUSEKEEPING/PREVENTATIVE MAINTENANCE(PM)

2.13.1 OBJECTIVE

Establish effective housekeeping checks and preventative maintenance programs to control environmental hazards.

2.13.2 TARGETS

Housekeeping audits identify no more than 5% non-conformance practices (except where applied to Consent conditions, where 0% non-conformance applies)

2.13.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Management	Responsibility	Timing
Housekeeping	• Housekeeping checks will include the following environmental issues: • Chemical and fuel bunding; • Bund content and drainage point valve in off position; • Spill clean-up and spill kit equipment contents; • Waste container labelling; • Tarping practices; • Road and vehicle cleanliness; • Unusual noises; • Visual dust presence of significance; and • Segregation of Inert type wastes from solid and from industrial wastes.	EPA Bunding Guidelines	PrM/MS/MM	Monthly
Preventative Maintenance	• PM system checklists are available to capture: • Fixed System Dust Suppression • Watering truck and sweeper vehicles • Water spays and lines	PM schedules	MM	Monthly/ annually

	• Spill Kits • Dust extraction units will be serviced annually.			Annually

2.14 STORAGE & HANDLING CONTROLS

2.14.1 OBJECTIVE

To minimise chemical and fuel run-off and land contamination due to spillage/ release/ stormwater flushing.

2.14.2 TARGETS

No visible oils/fuels in stormwater discharging from discharge point.
No significant soil contamination.

2.14.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Management	Responsibility	Timing
Storage Controls	● Signage will be maintained around bunded fuel tanks describing the filling procedure to be followed.	-	MM	All times
	● All fuels and chemicals in containers over 100 litres will be bunded when stored or in use.	EPA Bunding Guidelines		All times
	● Captured rainwater within fuel/oil storage bunds will be released through triple interceptor prior to release to the stormwater system.	-		As required
Soil Clean up	● Areas of significantly hydrocarbon-contaminated soil will be excavated and remediated in accordance with the Hydrocarbon Land-farming Procedure.	Hydrocarbon Land-farming Procedure	PrM	As required

2.14.4 EXPLOSIVES USE & STORAGE

Explosives are used for primary blasting in accordance with the requirements of the ERR. Bulk explosives are used on site and these are delivered from an external supplier. The quantity of bulk explosives required for one shot is predetermined and only the required explosives are delivered to the site. Surplus explosive is removed from the site by the supplier.

2.15 DONAZZAN'S DAM INTEGRITY

2.15.1 OBJECTIVES

To maintain the structural integrity of Donazzan's Dam.

2.15.2 TARGETS

No leakages, spills or other containment failures associated with the Dam.

2.15.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Management	Responsibility	Timing
Monitoring	Engage specialist geotechnical consultant to review dam structural integrity.	-	QM	Every 5 years. Next review 2025

2.15.4 MONITORING SCHEDULE

Item	Action	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Dam Integrity	Monthly inspection	Technical Officer	Monthly	Visual inspection, BH1 and BH6	No changes
Dam Integrity Review	To be nominated by Specialist	Specialist Geotechnical Consultant	5 years	To be nominated by Specialist	Certification statement by specialist

SECTION C – REHABILITATION: PROVISION, STATUS & PLAN UPDATE

1.0 REHABILITATION & VEGETATION

1.1 OBJECTIVES

The main objectives for the landscape and rehabilitation of the quarry operations area are to:

- create an ecological community with a predominance of indigenous species to provide a contribution to net gain objectives and habitat hectares.
- minimise the visual impact of the proposed extension from surrounding viewpoints
- stabilise soil.
- create an environment that will provide habitat for local and migratory fauna.
- create a safe and functional landscape.
- reinforce the local landscape character through the use of indigenous EVC units of the Pakenham area
- address drainage issues.

Further objectives are to:

- ensure that existing vegetation is maintained where practicable,
- ensure that landscape screening and rehabilitation is successfully established and subsequently maintained. Minimise the visual impact of the quarry operation upon the existing landscape of the local area,
- ensure that vehicles entering or leaving the site do not spread weed seeds to or from the site.

1.2 TARGETS

Successful establishment and maintenance of landscape screening and rehabilitation in accordance with the Work Plan attachment *Landscape and Rehabilitation Report, ERM* (January 2005) and the *Landscape & Rehabilitation Management Plan, 2007*, (LRMP) to the satisfaction of the ERR and the Responsible Authority.

Maintenance of existing vegetation where practicable.

1.3 DESIGN METHODOLOGY

The Landscape & Rehabilitation Report, sets out design methodologies to achieve these objectives and targets. The progressive quarry excavation will require on-going rehabilitation activities to control erosion, and make all earthworks safe and as compatible as possible with the surrounding landscape. Construction and revegetation will be undertaken in accordance with the LRR and other studies forming part of the EES Technical Supplement (as applicable) to achieve successful rehabilitation. These are fully described in the respective reports and are briefly summarised below.

Batter and Bench Profiles

- The rehabilitation batters will be developed at a grade not steeper than 1V:1.5H with 5m wide benches every 10m of vertical height.
- The benches will be backsloped at a grade of 1:10 towards the toe of the batter so that surface drainage water flows into the drains at the toe of the batter.
- The benches will be sloped at a low longitudinal grade so that the drainage water can move towards a surface, rubble lined drain to the next lower bench.

This system will be repeated around the perimeter of the quarry so that water leads to the purpose-designed water bodies in the floor of the quarry.

Planting Programs

- Rehabilitation batters will be hydro-seeded with sterile Rye Grass to form an immediate cover and protect the surface before the native species establish and develop.
- All subsequent plantings will comply with the Ecological Vegetation Communities Mapping of Port Phillip and Westernport and the Cardinia Shire Planting Schedule (Zone 3). It is proposed to use the Lowland Forest species for benches above RL165 and the Grassy Forest for benches below RL 165.
- A variety of planting techniques such as tube and cell planting, direct seeding and hydro-mulching to achieve the final development of canopy species, mid-storey species, low shrubs and ground covers.

The full details of the planting modules, species densities and a schedule of revegetation operations is given in the LRR.

Quarry Floor

- The infrastructure on the quarry floor consists of a series of drains and water bodies. The water bodies will be designed in part to provide habitat for native fauna.
- Prior to quarry closure, a Rehabilitated Quarry Water Management System will be developed which will incorporate (as appropriate) the recommendations of s.12 of the **EES – URS Surface Water Report**.
- Adjacent to the floor drains riparian species would be used to cope with the occasional inundation.
- The remaining area will be planted to grassland, scattered shrub and overstorey canopy.
- It is planned to use sterile rye grass as an initial ground cover and then introduce native grass species.

Maintenance

- Plant growth will be monitored to identify the success of the various species and assess future requirements.
- Monitoring and record keeping are essential components for assessing which species will be the most successful at the site.
- Plants will be watered as required until established or to the satisfaction of a ERR inspector in consultation with the Responsible Authority.
- Weeds will be controlled.
- Tube stock will be protected with tree guards which provide some protection from browsing animals, both native and exotic.
- Fencing will be maintained to exclude stock from newly planted areas.

Maintenance of rehabilitated areas is described in further detail in the following section.

1.4 MANAGEMENT MEASURES

1.4.1 GENERAL

The Landscape and Rehabilitation Management Plan (LRMP) has been prepared to deal with general rehabilitation and landscaping under the Work Plan and associated documentation, slope stability planting, net gain planting and surface water plantings, as required by the Permit. This plan addresses issues relating to maintenance including plant establishment, erosion control, weed control, planting protection, fencing, safety and other relevant management issues.

The LRMP covers all planting and rehabilitation within the quarry operational and non-operational areas. Detailed management measures associated with the net gain area are set out in the Net Gain Offset Management Plan (NGOMP) referenced in s.2.8 of this EMP.

The LRMP deals in detail with the management of the following aspects of quarrying operations as they relate to landscape and rehabilitation:

- Vehicle Management - Inspection of Vehicles, Clean down of Machinery, Vehicles and Equipment, Use of public roads and pathways, Provision of public safety
- Topsoil Scraping and Stockpiling
- Weed and Vermin Control, and Herbicide Use
- Existing Vegetation Management, including:
    - Seed Collection
    - Topsoil spreading
    - Hydro-seeding
    - Setting out works
    - Fencing and Signage
    - Supervision
    - Cleaning Up
    - Erosion control
    - Maintenance during plant establishment period of 52 weeks
- Soil Testing

Reference should be made to the LRMP for all such issues arising as part of the on-going maintenance of landscaped and rehabilitated areas.

1.4.2 ONGOING AND POST OPERATIONS MANAGEMENT

Ongoing maintenance, monitoring and rectification will be carried out by, and under the direction of, the site Rehabilitation ("Rehab") Manager and will include (but not necessarily be limited to):

- Maintenance of the surface of site access tracks.
- Maintenance of all fences and signs.
- Pruning branches overhanging and imposing on access tracks.
- Monitoring and control of weeds as necessary, ensuring weed controllers have attended a DSE 'Farm Chemical User Course' or equivalent and have appropriate approvals.
- Monitoring health of retained and planted vegetation and checking for pests and diseases.
- Monitoring stability of berms and berm walls.

- Replant terrestrial planted areas that have failed and provide significant gaps on the horizon line.
- Regrading necessitated by erosion and washouts.
- Rehabilitation of quarry water management system.
- Treatment of disease or other infestation in vegetation as necessary and as approved in consultation with DSE.
- Control of pest animal species.

At the completion of all quarrying activities, the site is to be reviewed to ascertain plant losses. Replanting as part of the ongoing monitoring and maintenance is to continue for a period of 12 months after completion of extraction after which the planting will rely on natural regeneration.)

1.4.3 MONITORING, REPORTING AND REVIEW

A site Rehab Manager is to be appointed with responsibility for the following:

- Ensuring any contractors and staff are aware of the LRMP and its requirements;
- Carrying out any monitoring, testing and corrective actions;
- Reporting and reviews as specified in this LRMP;
- Land management practices undertaken;
- Rehabilitation works completed;
- Complaints received and properly recorded and actioned;
- Non-conformances and corrective actions; and
- Results of site inspections.

The Rehab Manager is to submit land management reports to Holcim Management and the ERC during the quarrying phase every 6 months from the commencement of rehabilitation. These reports will summarise the implementation of the LRMP and consider environmental impacts and processes and will include comment on:

- Land management practices undertaken;
- Rehabilitation works completed;
- Complaints received;
- Non-conformances and corrective actions; Examples:
  - Excessive weed invasion
  - Significant loss of plantings
  - Failure to implement weed management program

- Soil contamination
- Failure to complete scheduled inspections
- Failure to close out audit actions in a timely manner

- Results of site inspections
- Results of water quality testing;
- Health of existing indigenous vegetation;
- Recruitment of indigenous vegetation into rehabilitation and landscape areas;
- Weed invasion;
- Erosion;
- Water quality; and
- Proposed alterations to the LMRP in line with the current best practice

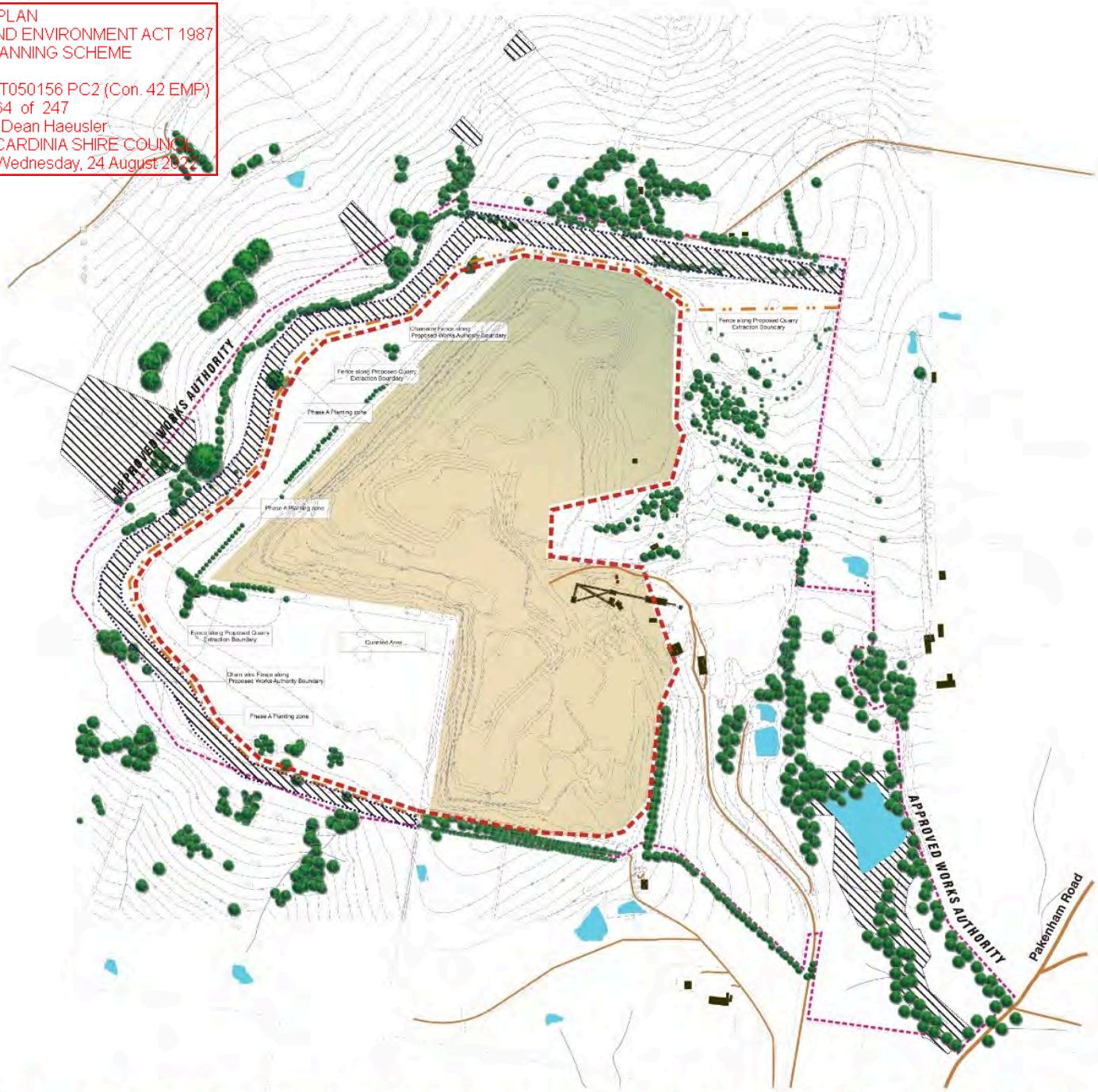
1.5 MONITORING

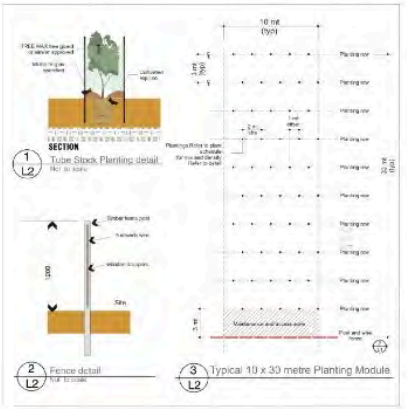
Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Landscape & Rehabilitation Development	Status Report & Recommendation	Independent Expert	2 yearly or as required by ERR Inspector in consultation with Council	EES - Work Plan LRMP	Compliance with LRMP
		Rehab Manager	6 monthly	LRMP	Compliance with LRMP
Litter (Work Authority boundaries and office/ operational areas)	Status Report & Recommendation	Rehab Manager	6 monthly	LRMP	Compliance with LRMP
Erosion & Sediment Control (Work Authority boundaries)	Visual inspection during stripping and earthworks	Rehab Manager	Weekly when stripping	Clear water, (suspended solids test if requested)	

Weed Control (Whole Work Authority Area)	Visual monitoring & Spraying Follow up Inspection & spraying	Rehab Manager	Twice yearly (October, December/ January)	LRMP	Absence of noxious weeds; Effective control achieved

APPROVED PLAN
PLANNING AND ENVIRONMENT ACT 1987
CARDINIA PLANNING SCHEME

Permit No.: T050156 PC2 (Con. 42 EMP)
Sheet: 64 of 247
Approved by: Dean Haeusler
CARDINIA SHIRE COUNCIL
Date: Wednesday, 24 August 2022





Plant Species

			Height	Spread	Density
GUM	Eucalyptus viminalis	Manna Gum	10.0 - 30.0m	3.0 - 15.0m	10%
EUR	Eucalyptus radiata	Narrow Leaf Peppermint	10.0 - 30.0m	5.0 - 15.0m	10%
MAG	Eucalyptus obliqua	Messmate	10.0 - 30.0m	4.0 - 7.0m	20%
ACM	Acacia mearnsii mollis	Blackwood	10.0 - 30.0m	4.0 - 5.0m	20%
ACD	Acacia dealbata	Silver Wattle	8.0 - 30.0m	6.0 - 10.0m	10%
CAS	Casuarina cunninghamiana	Common Oergwood	2.0 - 4.0m	1.0 - 2.0m	5%
EUF	Eucalyptus fulgens	Green Scented Gum	8.0 - 30.0m	5.0 - 12.0m	10%

	Tasks	Details
Prior to planting and seed collection	Mark out planting areas for approval by site superintendent and install safety fence	To be done prior to seed collection to determine exact planting areas and numbers and establish safety zones. All planting areas to be approved in writing prior to any cultivation, weed or vermin control.
Seed collection	Collect Seed	Prepare detailed seed collection program including seed collection techniques, seed source locations, sub-contractors and preferred nursery's or growers. This is to be approved by the site superintendents prior to the collection of any seed material.
Prior to planting	Preliminary weed / pest control	Prepare and submit a Rabbit management program. Weed control be required for all planting sites.
	Follow-up Weed control	Repeat spray with a contact herbicide.
Tube Planting Autumn	Plant Seed or Tubestock	Deep rip the proposed planting areas. Remove from site any stone and rock greater than 50mm diameter. Rotary hoe or cultivate along planting lines.
Maintenance		Maintenance includes the regular mowing between planted strips. Maintenance of vegetation will include fertilising and pruning of trees, replacement of dead plants as and when directed by Site superintendent, cleaning up of ground and care of tree guards and protecting fences and all other works to ensure satisfactory upkeep.

Legend

- Existing Vegetation
- Phase A Planting (Refer L2a)
- Phase B Planting - URS proposed landslip Tree Planting (Refer L3a)
- Phase C Scattered Planting (Refer L4a)
- Proposed Quarry Extraction Boundary (L2)
- Fenceline along Proposed Quarry Extraction
- Net Gain Offset Sites (to be fenced and maintained by Readymix)
- New Chainwire fence along Approved Works Authority Boundary

Readymix™

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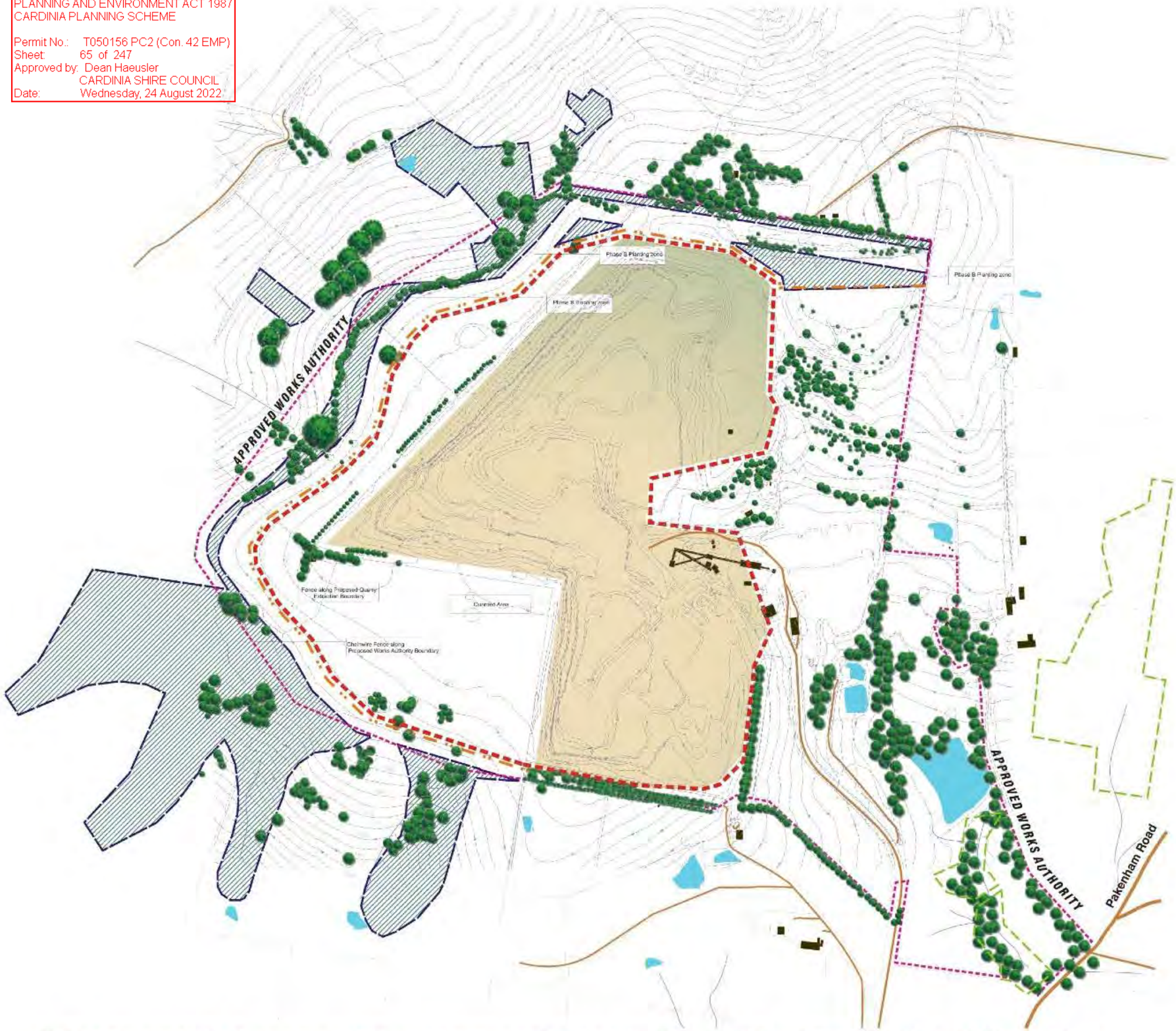
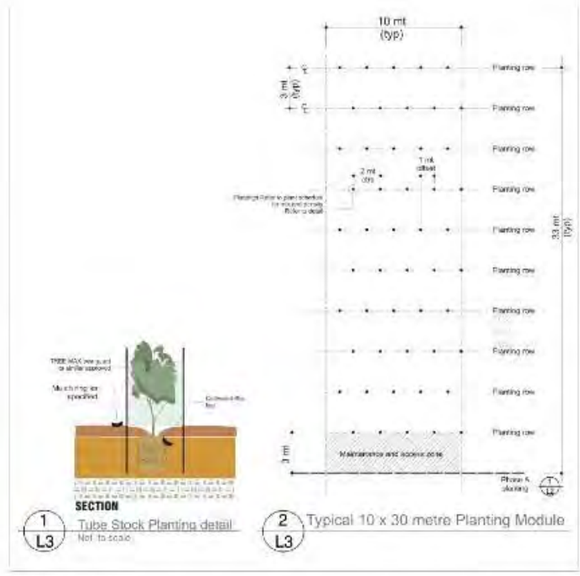
Project No 0029999
January 2008

Mt Shamrock Quarry, Pakenham
Non-Quarry Operational Area: Landscape Plan
Planting Phase A

Drawing: L2a

Refer to updated Species list recommendations in 2021 edition of EMP as they have been changed in line with LRMP reviews





Plant Species

			Height	Spread	Density
ELV	Eucalyptus viminalis	Manna Gum	10.0 - 30.0m	6.0 - 15.0m	15%
EUR	Eucalyptus radiata	Narrow Leaf Peppermint	10.0 - 30.0m	6.0 - 10.0m	15%
EUO	Eucalyptus obliqua	Messmate	10.0 - 50.0m	4.0 - 7.0m	20%
ACM	Acacia melanoxylon	Blackwood	10.0 - 30.0m	4.0 - 6.0m	25%
ACD	Acacia dealbata	Silver Wattle	8.0 - 30.0m	6.0 - 10.0m	10%
CAS	Cassinia aculeata	Common Dogwood	2.0 - 4.0m	1.0 - 2.0m	5%
EUF	Eucalyptus fulgens	Green Scarlet Gum	5.0 - 20.0m	5.0 - 12.0m	10%

Tasks		Details
Prior to planting and seed collection	Mark out planting areas for approval by site superintendent and install safety fence	To be done prior to seed collection to determine exact planting areas and numbers and establish safety zones. All planting areas to be approved in writing prior to any cultivation, weed or vermin control.
Seed collection	Collect Seed	Prepare detailed seed collection program including seed collection techniques, seed source locations, sub-contractors and preferred nursery's or growers. This is to be approved by the site superintendents prior to the collection of any seed material.
Prior to planting	Preliminary weed / pest control	Prepare and submit a Rabbit management program. Weed control be required for all planting sites.
	Follow-up Weed control	Repeat spray with a contact herbicide.
Tube Planting Autumn	Plant Seed or Tubestock	Deep rip the proposed planting areas. Remove from site any stone and rock greater than 50mm diameter. Rotary hoe or cultivate along planting lines.
Maintenance		Maintenance includes the regular mowing between planted strips. Maintenance of vegetation will include fertilising and pruning of trees, replacement of dead plants as and when directed by Site superintendent, cleaning up of ground and care of tree guards and protecting fences and all other works to ensure satisfactory upkeep.

Legend

- Existing Vegetation
- Phase A Planting (Refer L2a)
- Phase B Planting - URS proposed landslip Tree Planting (Refer L3a)
- Phase C Scattered Planting (Refer L4a)
- Proposed Quarry Extraction Boundary (1)
- Fenceline along Proposed Quarry Extraction
- Net Gain Offset Sites (to be fenced and maintained by Readymix)
- New Chainwire fence along Approved Works Authority Boundary

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Scale 1:2000 (A0)

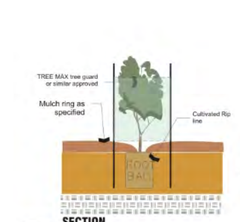
Mt Shamrock Quarry, Pakenham

Non-Quarry Operational Area:Landscape Plan
Planting Phase B

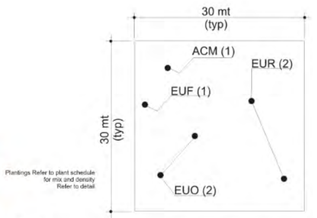
Project No 0002666
January 2006

Drawing:L3a

Refer to updated species list recommendations in the 2021 edition of the EMP as they have changed in line with LRMP reviews



1 L4 Tube Stock Planting detail
Not to scale



2 L4 Typical 30 x 30 metre Planting Module

Plant Species

			Height	Spread	Quantity
EUR	Eucalyptus radiata	Narrow Leaf Peppermint	12.0 - 30.0m	5.0 - 10.0m	40%
EUO	Eucalyptus obliqua	Messmate	13.0 - 70.0m	4.0 - 7.0m	40%
ACM	Acacia melanoxylon	Blackwood	10.0 - 30.0m	4.0 - 6.0m	10%
EUF	Eucalyptus fulgans	Green Scented Gum	5.0 - 20.0m	5.0 - 15.0m	10%

	Tasks	Details
Prior to planting and seed collection	Mark out planting areas for approval by site superintendent and install safety fence	To be done prior to seed collection to determine exact planting areas and numbers and establish safety zones. All planting areas to be approved in writing prior to any cultivation, weed or vermin control..
Seed collection	Collect Seed	Prepare detailed seed collection program including seed collection techniques, seed source locations, sub-contractors and preferred nursery's or growers. This is to be approved by the site superintendents prior to the collection of any seed material.
Prior to planting.	Preliminary weed / pest control	Prepare and submit a Rabbit management program. Weed control be required for all-planting sites.
	Follow-up Weed control	Repeat spray with a contact herbicide.
Tube Planting Autumn	Plant Seed or Tubestock	Deep rip the proposed planting areas. Remove from site any stone and rock greater than 50mm diameter. Rotary hoe or cultivate along planting lines.
Maintenance		Maintenance includes the regular mowing between planted strips. Maintenance of vegetation will include fertilising and pruning of trees, replacement of dead plants as and when directed by Site superintendent, cleaning up of ground and care of tree guards and protecting fences and all other works to ensure satisfactory upkeep.

Legend

- Existing Vegetation
- Phase A Planting (Refer L2a)
- Phase B Planting - URS proposed landslip Tree Planting (Refer L3a)
- Phase C Scattered Planting (Refer L4a)
- Proposed Quarry Extraction Boundary (2 L2)
- Fenceline along Proposed Quarry Extraction
- Net Gain Offset Sites (to be fenced and maintained by Readymix)
- New Chainwire fence along Approved Works Authority Boundary

0 200m
Scale 1:2500 (A0)

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Project No.0022666
January 2008

Mt Shamrock Quarry, Pakenham

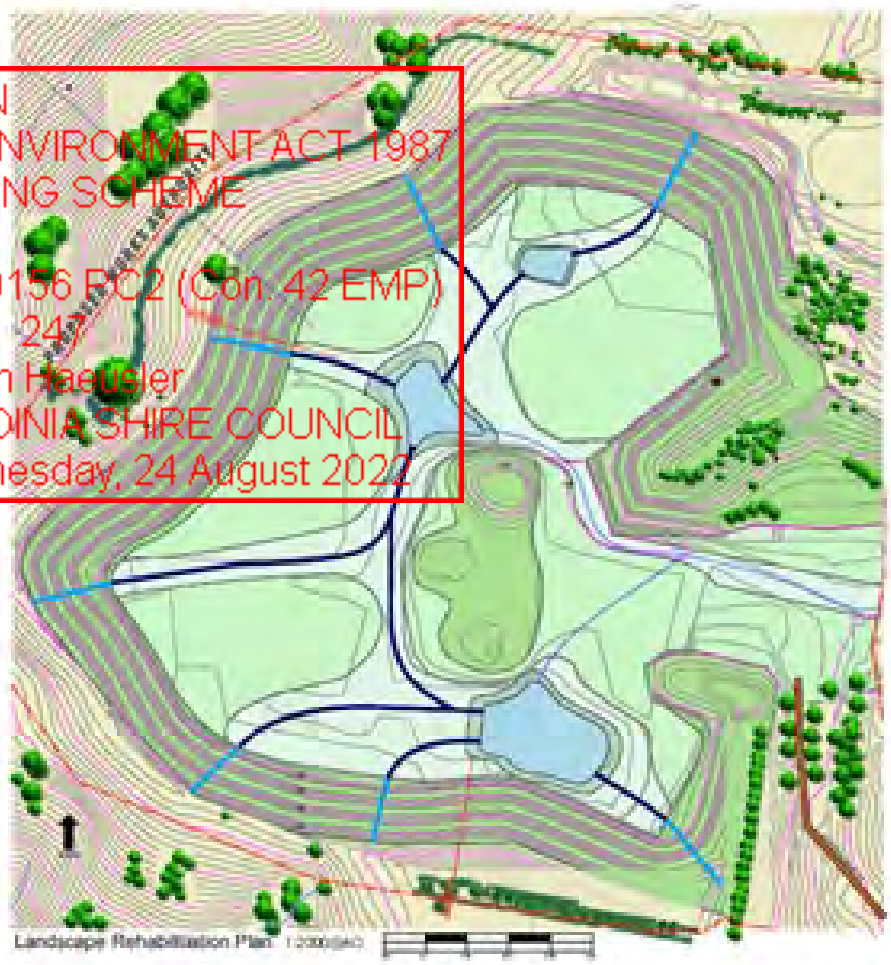
Non-Quarry Operational Area:Landscape Plan
Planting Phase C

Drawing:L4a

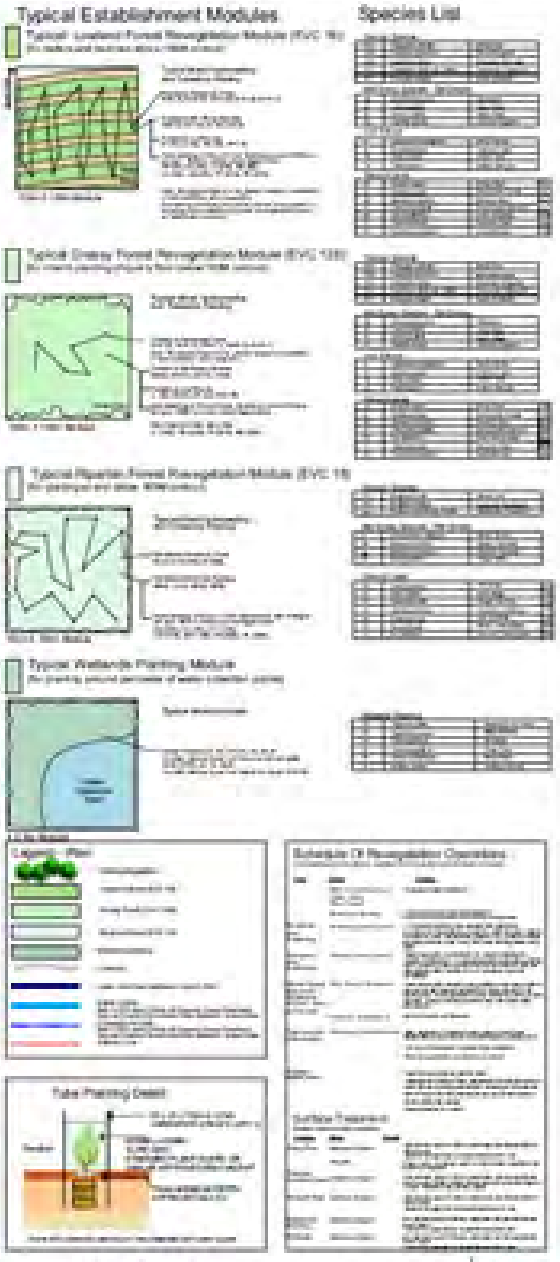
refer to 2021 EMP edition, species list have changed in line with LRMP reviews

APPROVED PLAN
PLANNING AND ENVIRONMENT ACT 1987
CARDINIA PLANNING SCHEME

Permit No.: T050156 RC2 (Con. 42 EMP)
Sheet: 67 of 247
Approved by: Dean Haeusler
CARDINIA SHIRE COUNCIL
Date: Wednesday, 24 August 2022



Landscape Rehabilitation Plan 1:2000@A0



Legend - Sections A-A' and B-B'

Readymix

Drawing 11a

ERM

Appendix 1

PROCEDURE FOR THE APPOINTMENT OF ENVIRONMENTAL TRAINING SPECIALISTS

This document specifies the appointment of specialist consultants/experts to provide environmental training and certification of staff at the site in conducting monitoring activities as specified in Section 5.1 of the site's Environmental Management Plan.

Site: Pakenham Quarry

Date prepared: 28.11.13

Scope of Work

- Prepare a draft scope of work for each of the required training processes and select a preferred contractor.
- Where new or amended drafts of the scope of works are generated they will be presented to the ERC for review and comment.
- Only upon acceptance of the new or amended draft scope of works will relevant appointments be made.

Structure of Training

- Training must be structured to include both theoretical and practical instruction.
- Trainees must be required to demonstrate that they have acquired sufficient competency in the subject material to undertake the required monitoring activities accurately and reproducibly.

Form of Certificate Certifying Competence.

- The training specialists appointed will nominate the form of the Certificate certifying competence.

Refresher Training

- The training specialists appointed will nominate the appropriate interval for refresher training to be conducted.

Appendix 2

ENVIRONMENTAL REPORTING PROCEDURE

This document specifies all environmental reporting requirements (statutory and non-statutory) to external parties under the site's Environmental Management Plan (EMP).

Site: Pakenham Quarry

Date updated : July 2021

Incidents

- All detected EMP non-compliances will be reported to management and discussed with the site at toolbox talks.
- All EMP non-compliances will be entered and recorded in the ICARE 2.0 electronic database.
- Incident reports are to be made to relevant Regulatory Authorities in accordance with their requirements.

Quarterly Reports

- A report of activities and actions carried out under the site EMP will be prepared each quarter
- The reports will contain:
  - A summary providing highlights
  - A brief summary of activities carried out
  - Any variances from the EMP and the reason for such variance
  - All results of environmental monitoring
  - All non-compliances with descriptions of actions taken and the results of those actions (it will suffice to attach copies of the completed Incident Forms for this purpose)
  - The results of the independent audit and Holcim's response to the audit report will be prepared and provided to management, technical staff and all members of the ERC.

- Quarterly report summaries are to be provided to management and quarry operating staff.
- Quarterly reports are to be provided to technical staff and presented to ERC meetings.
- Copies of this report should also be made available to operating staff.

EPA Licence Reporting

- The following are the EPA Licence reporting requirements –
  - Annual reporting as per Conditions G3 – by 30 September every year
  - Incident and Exception reporting as per Conditions G1

Appendix 3

EMP REVIEW PROCEDURE

This document specifies the procedure to be followed when reviewing the site Environmental Management Plan (EMP).

Site: Pakenham Quarry

Date updated: January 2021

General

- A review of the entire EMP will be carried out by Holcim Quarry management, in consultation with the relevant Authorities.
- Site Management will ensure that all the necessary information is collected beforehand to allow management to carry out the review.

Review Items

- Management reviews will identify any need to make changes to the objectives & targets, operating procedures and measures being taken to implement the EMP.
- The review items include, but may not be limited to:
  - Environmental objectives, targets and environmental performance.
  - Findings in EMP audits.
  - Corrective action arising from Incident Reports
  - Lessons learned from environmental incidents
  - Results of environmental monitoring
  - Complaints history
  - Changes to legislation or government policies
  - Changing expectations and requirements of interested parties
  - Advances in science and technology
  - Effectiveness of reporting and communication.

Frequency

- The site EMP will be reviewed at least every five (5) years.
- More frequent reviews may be conducted of all or part of the EMP.
- All reviews will be documented, records maintained and both record of reviews and minutes of review meeting(s) will be retained.
- A summary of the outcomes of the review will be communicated to all staff in the organisation.
- A copy of the draft reviewed EMP will be submitted to the ERC for its comments.
- The final agreed version of the draft reviewed EMP will be submitted to the Responsible Authority for approval.

Appendix 4 - Significant Environment Hazards Register

Site:	***Pakenham Quarry***
Completed by:	***Garry Pirie [Environment Manager Vic/SA/Tas]***
Date Completed:	***April 2014***

Hazard / Aspect	Potential Impact	Current Controls	Risk Rating With Current Controls		
			Consequence	Likelihood	Risk Rating
Quarry Development					
Removal of vegetation and land disturbance.	Potential damage to fauna and habitat	Strict rules for approval to clear vegetation in place. Approval required from Aggregates Planning & Environment Team prior to any vegetation clearing or land disturbance. Any approved works must be carried out in accordance with permit conditions and local requirement for clearing permits.	Severe	Unlikely	**Medium**
Removal of vegetation and land disturbance.	Clearing outside approved area resulting in breach of legal/permit requirements or loss of reputation.	Approved extraction and clearing boundaries marked on the ground in accordance with Holcim boundary marking guidelines.	Severe	Unlikely	**Medium**
Removal of vegetation and land disturbance.	Waste generated from the management of stripped vegetation	Excavated vegetation is stockpiled for habitat provision or is mulched for use in landscaping and erosion control.	Significant	Possible	**Low**
Removal of vegetation and land disturbance.	Loss or destruction of heritage areas, items or artefacts.	Assessment of archaeological and heritage impacts are undertaken and management plans are in place as required.	Severe	Unlikely	**Medium**
Stripping and stockpiling of topsoil and overburden.	Erosion due to land disturbance and stockpile management	Silt fences, bunding, hay bailing, rock walling or other erosion control devices are installed around disturbed areas on a needs basis.	Significant	Possible	**Low**
Stripping and stockpiling of topsoil and overburden.	Airborne dust creating air emissions	Disturbed areas are watered using water cart during stripping activities.	Significant	Possible	**Low**
Stripping and stockpiling of topsoil and overburden.	Airborne dust creating air emissions	Adequate buffer distances or screening bunds are created between the stripping location and any nearby sensitive receivers.	Serious	Unlikely	**Low**
Stripping and stockpiling of topsoil and overburden.	Air emissions caused by excessive exhaust from mobile equipment.	Mobile haulage equipment is maintained to OEM requirements to maintain emission standards. 10 second rule used as a trigger for the scheduling of repairs or maintenance.	Minor	Possible	**Low**
Stripping and stockpiling of topsoil and overburden.	Visual amenity issues resulting from the removal of vegetation.	Adequate buffer distances or screening bunds are created between the stripping location and any nearby sensitive receivers.	Significant	Unlikely	**Low**

Stripping and stockpiling of topsoil and overburden.	Loss of biological activity, contamination or erosion of topsoil	Top soil is managed in separate stockpiles that are limited to 2m in height or is reused in thin layers for rehabilitation or landscaping works.	Significant	Unlikely	**Low**
Stripping and stockpiling of topsoil and overburden.	Loss of biological activity, contamination or erosion of topsoil	Temporary crop cover is established on topsoil stockpiles to reduce potential for erosion and to maintain biological activity.	Significant	Unlikely	**Low**
Stripping and stockpiling of topsoil and overburden.	Waste generated from the management of overburden.	Adequate volumes of overburden are retained for future rehabilitation requirements. Excess overburden is disposed of in properly constructed and approved overburden dumps.	Significant	Unlikely	**Low**
Stripping and stockpiling of topsoil and overburden.	Impact on water quality from sediment carried in runoff water.	Silt fences, bunding, hay bailing, rock walling or other erosion control devices are installed around disturbed areas on a needs basis.	Significant	Possible	**Low**
Stripping and stockpiling of topsoil and overburden.	Impact on water quality from disturbance of acid sulphate soils	The potential for acid sulphate is known and where identified a formal plan of management is in place in accordance with site approval conditions.	Severe	Rare	**Low**
Stripping and stockpiling of topsoil and overburden.	Excessive consumption of water	Watering of disturbed areas carried out only on a needs basis. Excess water that drains from disturbed area is captured and transferred to storages for reuse.	Minor	Unlikely	**Low**
Stripping and stockpiling of topsoil and overburden.	Operation of mobile equipment creating noise emissions	In noise sensitive areas mobile equipment is fitted with modulating, low frequency directional reversing alarms.	Significant	Possible	**Low**
Drill & Blast					
Drilling in hard rock	Air emissions due to dust generated from drilling	Functional and well maintained dust extraction and collection equipment is fitted to all drill rigs.	Significant	Possible	**Low**
Drilling in hard rock	Air emissions due to exhaust from drill rig	Drill rigs well maintained. 10 second rule used as trigger to arrange the scheduling of maintenance or replacement with drilling contractor.	Minor	Possible	**Low**
Blasting	Air emissions due to dust generated from blast detonation.	Dust generated from blasting controlled by the topography of the pit and surrounding bund walls and provision of buffer areas.	Significant	Unlikely	**Low**
Blasting	Air emissions due to explosive burn.	Each blast is designed by a qualified shot firer to optimise fragmentation and muck pile profile with minimum explosive use within site blasting approval conditions.	Significant	Unlikely	**Low**
Blasting	Explosive waste due to inappropriate storage and handling.	Explosives are not stored on site. Blasting contractors/suppliers bring required explosives on site for a specific blast and take away any unused explosives following the blast.	Severe	Rare	**Low**
Blasting	Explosive waste due to failure to use prior to expiry date.	Blasting contractors/suppliers bring in date explosives on site for a specific blast and take away any unused explosives following the blast.	Severe	Rare	**Low**

Blasting	Uncontrolled fly-rock, ground vibration or air blast.	All blasts and drill holes are set out and checked by accurate survey techniques.	Serious	Possible	**Medium**
Blasting	Uncontrolled fly-rock, ground vibration or air blast.	Strict company policy that laser profiling and bore tracking is used as a minimum on all front row blast holes to confirm that minimum burdens are achieved.	Serious	Unlikely	**Low**
Blasting	Neighbour complaints due to blasting ground vibration or air blast.	Air blast and ground vibration is monitored at sensitive locations and video records are maintained to confirm compliance with approval conditions and to assist in investigations in the event of a compliant.	Significant	Possible	**Low**
Blasting	Neighbour complaints due to blasting ground vibration or air blast.	Neighbours are made familiar with the site blast schedule, and/or are informed prior to blast events.	Significant	Possible	**Low**
Blasting	Neighbour complaints due to blasting ground vibration or air blast.	Attempts are made to limit blasting during unfavourable weather conditions that are likely to enhance the propagation of air blast in the direction of sensitive receivers.	Significant	Possible	**Low**
Blasting	Neighbour complaints due to blasting ground vibration or air blast.	In sensitive locations drilling is scheduled for periods other than when background noise levels are low e.g.. Drilling is conducted during daytime period.	Significant	Possible	**Low**
Extraction					
Loading material into dump trucks	Air emissions due to generation of airborne dust.	Muck pile is watered as required to moisten feed material prior to loading.	Significant	Possible	**Low**
Loading material into dump trucks	Air emissions due to excessive vehicle exhaust.	Loading tools are maintained to OEM requirements to maintain emission standards. 10 second rule used as a trigger for the scheduling of repairs or maintenance.	Minor	Possible	**Low**
Hauling material using dump trucks	Air emissions due to generation of airborne dust.	Haul roads are watered to reduce dust emissions.	Significant	Possible	**Low**
Hauling material using dump trucks	Air emissions due to excessive vehicle exhaust.	Mobile haulage equipment is maintained to OEM requirements to maintain emission standards. 10 second rule used as a trigger for the scheduling of repairs or maintenance.	Minor	Possible	**Low**
Tipping material into boot or hopper	Air emissions due to generation of airborne dust.	Muck pile is watered to moisten feed material prior to loading.	Significant	Possible	**Low**
Watering of haul roads	Dust suppression water use causing sediment laden runoff.	Where required drainage works are provided to capture runoff and direct it through silt fences, bunding, hay bailing, rock walling or other sediment control devices on its way back to on-site water storages for reuse.	Significant	Unlikely	**Low**
Watering of haul roads	Excessive consumption of water resources.	Haul roads watered on a needs basis only. Any excessive water runs off to on-site water storages for reuse.	Minor	Unlikely	**Low**

Mobile equipment use in extraction areas	Land degradation due to spillage of hydrocarbons resulting from hose or component failure.	All spills are cleaned up promptly, reported and investigated with the generation of corrective actions as required.	Minor	Likely	**Low**
Mobile equipment use in extraction areas	Land degradation due to spillage of hydrocarbons resulting from hose or component failure.	Spill response equipment is available and maintained to allow ready use in the event of a hydrocarbon spill. All appropriate personnel have been trained in its use.	Minor	Likely	**Low**
Mobile equipment use in extraction areas	Generation and management of waste soil due to spillage of hydrocarbons resulting from hose or component failure.	All spills are cleaned up promptly with contaminated soil collected and stored until it can be collected and transferred to an appropriately licenced waste facility.	Minor	Likely	**Low**
Mobile equipment use in extraction areas	Operation of mobile equipment creating noise emissions	Adequate buffer distances or screening bunds are created between the extraction area and any nearby sensitive receivers.	Significant	Possible	**Low**
Mobile equipment use in extraction areas	Operation of mobile equipment creating noise emissions	Access tracks and haul roads are well maintained to prevent potholes and corrugations that contribute to truck noise.	Significant	Possible	**Low**
Mobile equipment use in extraction areas	Operation of mobile equipment creating noise emissions	Mobile equipment is well maintained to OEM standards to reduce operational noise.	Significant	Possible	**Low**
Mobile equipment use in extraction areas	Operation of mobile equipment creating noise emissions	Site operated in accordance with approved hours of operation contained within licence conditions and approvals.	Significant	Possible	**Low**
Mobile equipment use in extraction areas	Operation of mobile equipment creating noise emissions	Access tracks and haul roads are well maintained to prevent corrugation that contributes to truck noise.	Significant	Possible	**Low**
Mobile equipment use in extraction areas	Operation of mobile equipment creating noise emissions	In noise sensitive areas mobile equipment is fitted with modulating, low frequency directional reversing alarms.	Significant	Possible	**Low**
Material Transfer, Crushing, Screening, Stockpiling and Ancillary Processes					
Operation of fixed material processing plant	Air emissions due to discharge of airborne dust at discharge or transfer points.	The site has a dust management strategy in place that includes controls for the suppression or containment of dust.	Significant	Possible	**Low**
Operation of fixed material processing plant	Air emissions due to discharge of airborne dust at discharge or transfer points.	Dust suppression and containment controls are included within the sites maintenance program to ensure they are available and effective when required to be operated.	Significant	Possible	**Low**
Operation of fixed material processing plant	Air emissions due to discharge of airborne dust at discharge or transfer points.	Dust suppression controls are monitored during operation to ensure they are being employed as needs and working effectively.	Significant	Possible	**Low**
Operation of fixed material processing plant	Air emissions due to discharge of airborne dust at discharge or transfer points accumulating and passing the site boundary.	Adequate buffer distance and local topography assist in preventing dust from leaving the boundary of the site during operation	Serious	Unlikely	**Low**

Operation of fixed material processing plant	Air emissions due to creation of airborne dust from disturbing accumulated dust on horizontal surfaces.	Dust suppression and containment controls minimise the accumulation of dust on horizontal surfaces. Housekeeping procedures are in place to keep dust accumulation as low as practicable.	Significant	Possible	**Low**
Operation of mobile equipment (moving or pushing up stock, loading back feed bins etc.)	Air emissions generated from material movement.	The loading faces of stock is watered on a needs basis to reduce dust emissions.	Significant	Possible	**Low**
Storage and handling of dry powders (including cement, claypro etc.).	Air emissions generated during transfer of dry powder into storage silos.	Inspection and dipping points are sealed to prevent dry powder escape.	Significant	Possible	**Low**
Storage and handling of dry powders (including cement, claypro etc.).	Air emissions generated during transfer of dry powder into storage silos.	Silos are fitted with a functional and adequately sized revers pulse filter to remove dry powder from air being exhausted from the silo during filling processes.	Significant	Unlikely	**Low**
Storage and handling of dry powders (including cement, claypro etc.).	Air emissions generated during transfer of dry powder into storage silos.	Regular inspections during dry powder transfer and carried out to identify any sources of escape during filling processes.	Significant	Unlikely	**Low**
Storage and handling of dry powders (including cement, claypro etc.).	Air emissions generated during transfer of dry powder into storage silos.	Silos are fitted with dust prevention and in-fill controls as specified in the Holcim Australia Environmental Specifications.	Significant	Unlikely	**Low**
Storage and handling of dry powders (including cement, claypro etc.).	Air emissions, waste and contamination of water sources due to silo failure.	Silos are fitted with a pressure release valve that activates before internal pressure reaches dangerous levels.	Significant	Unlikely	**Low**
Storage and handling of dry powders (including cement, claypro etc.).	Air emissions, waste and contamination of water sources due to silo failure.	The silo is fitted with a compliant fail safe in-fill system.	Significant	Unlikely	**Low**
Storage and handling of dry powders (including cement, claypro etc.).	Air emissions, waste and contamination of water sources due to silo failure.	Silo filters and fill systems are subject to regular formal maintenance procedures by specialist contractors.	Significant	Unlikely	**Low**
Stockpiling of products	Water source contamination due to sediment laden run off from stockpile area.	Where required drainage works are provided to capture runoff and direct it through silt fences, bunding, hay bailing, rock walling or other sediment control devices on its way back to on-site water storages for reuse.	Significant	Unlikely	**Low**
Operation of fixed material processing plant	Excessive consumption of water resources.	Water runoff is collected and diverted back to water storages for reuse. water runs off to on-site water storages for reuse.	Significant	Unlikely	**Low**
Operation of fixed material processing plant	Excessive consumption of electricity.	Electricity use is monitored and consumption tracked.	Significant	Possible	**Low**
Operation of fixed material processing plant	Operation of fixed plant creating noise emissions	Fixed plant is well maintained to reduce operational noise. Excessive noise is used as a trigger to schedule repair and maintenance tasks.	Significant	Unlikely	**Low**

Operation of mobile equipment (moving or pushing up stock, loading back feed bins etc.)	Operation of fixed plant creating noise emissions	In noise sensitive areas mobile equipment is fitted with modulating, low frequency directional reversing alarms.	Significant	Unlikely	**Low**
Management of concrete waste	Water source contamination due to leaching of high pH stormwater runoff from concrete waste stockpiles.	Water leachate from concrete waste stockpiles is captured and diluted or treated to manage pH. Monitoring procedures are in place to ensure low pH water is not discharged from site as a result of waste concrete stockpiles.	Serious	Rare	**Low**
Operation of fixed material processing plant	Excessive generation of quarry by-products (dust, slime, tailings etc.)	Market outlets and sought to reduce the accumulation of by-products. Where possible these products are blended into other sealable products. Where not possible to sell the products into the market they are transferred to appropriately engineered and approved dumps within the quarry.	Significant	Rare	**Low**
Operation of fixed material processing plant	Generation of waste such as used oil, filters, batteries, steel, containers and packaging etc.)	Wastes streams are appropriately identified and segregated. Where possible waste items are recycled but where this is not possible they are transferred to appropriately licenced waste management facilities.	Significant	Rare	**Low**
Loadout, Weigh Bridge & Despatch					
Product loading and despatch	Dust emissions due to material transfer	Stockpiles are kept moist to reduce disturbance air emissions.	Significant	Possible	**Low**
Delivery of quarry products to customers along public roads	Dust emissions due to air movement across loaded trucks	Trucks are tarped prior to leaving quarry site and entering public roadway.	Significant	Unlikely	**Low**
Delivery of quarry products to customers along public roads	Dust emissions due to deposition of mud or other materials from trucks onto public roads.	Controls are in place to ensure material is not tracked onto public roadways, e.g. extended driveways, wheel wash, where it can dry out and become airborne when exposed to subsequent traffic movement.	Significant	Unlikely	**Low**
Delivery of quarry products to customers along public roads	Dust emissions due to deposition of mud or other materials from trucks onto public roads.	Roadways immediately beyond site entrance are regularly inspected and swept to prevent build up of material (dust and slip hazard).	Significant	Unlikely	**Low**
Delivery of quarry products to customers along public roads	Dust emissions due to deposition of mud or other materials from trucks onto public roads.	Residual product from tailgate and other horizontal surfaces is broomed off to prevent material blowing from truck during transport.	Significant	Unlikely	**Low**
Product loading and despatch	Deposition of material to stormwater at drop off point.	Delivery site selection at customer sites are inspected prior to tip-off to ensure that material cannot enter stormwater drains and waterways.	Serious	Possible	**Medium**
Plant & Vehicle Maintenance & Refuelling					
Vehicle & Plant Maintenance	Contamination of land or water due to fluid release during maintenance tasks.	Fluids released during machinery maintenance operations are collected and removed to an approved disposal site or are recycled.	Significant	Possible	**Low**
Vehicle & Plant Maintenance	Contamination of land or water due to fluid release during maintenance tasks.	Good housekeeping ensures that there is no spillage of oils or lubricants onto unsealed areas.	Significant	Possible	**Low**

Vehicle & Plant Maintenance	Air emissions due to excessive vehicle exhaust.	Mobile haulage equipment is maintained to OEM requirements to maintain emission standards. 10 second rule used as a trigger for the scheduling of repairs or maintenance.			#N/A
Vehicle & Plant Maintenance	Contamination of land or water due to release of wash water during equipment washdown tasks..	Trucks are washed in designated vehicle wash stations with wastewater capture, treatment and re-use.	Significant	Possible	**Low**
Storage & Handling of liquid fuels and chemicals	Contamination of land or water due to release of fuel or chemicals due to poor storage facilities.	All liquid fuels and chemicals are stored in a bunded area in accordance with the Holcim Bunding Guidelines.	Serious	Unlikely	**Low**
Storage & Handling of liquid fuels and chemicals	Contamination of land or water due to release of fuel or chemicals due to unattended transfer.	Operators remain with their vehicle at all times during the delivery of fuel and chemicals to permit immediate response in the event of any spill or leakage.	Serious	Unlikely	**Low**
Storage & Handling of liquid fuels and chemicals	Contamination of land or water due to release of fuel or chemicals due to poor storage facility maintenance.	Bunded areas must be regularly maintained. This includes checking and inspecting the integrity of bund and actively minimising ponding of stormwater by regular inspection and clean out of the bund after significant rain events.	Serious	Unlikely	**Low**
Storage & Handling of liquid fuels and chemicals	Contamination of land or water due to release of fuel or chemicals due to poor storage facility maintenance.	Maintenance of refuelling equipment is incorporated into the site maintenance schedule.	Serious	Unlikely	**Low**
Storage & Handling of liquid fuels and chemicals	Contamination of land or water due to release of fuel or chemicals due to poor storage facility site selection.	Storage areas are located away from waterways and areas prone to flooding.	Serious	Unlikely	**Low**
Refuelling of mobile equipment in extraction areas.	Degradation of land or stored water due to fuel spillages.	Tanks on mobile fuel carts are either self bunded type of fitted to a bunded vehicle.	Significant	Unlikely	**Low**
Refuelling of mobile equipment	Degradation of land or stored water due to fuel spillages.	Fuel delivery lines on mobile fuel carts are fitted with a breakaway coupling to avoid fuel losses in the event of a drive away incident.	Significant	Unlikely	**Low**
Refuelling of mobile equipment	Degradation of land or stored water due to fuel spillages.	Spill response equipment is available and maintained to allow ready use in the event of a fuel spill. All appropriate personnel have been trained in its use.	Significant	Unlikely	**Low**
Refuelling of mobile equipment	Degradation of land or stored water due to fuel spillages.	All spills are cleaned up promptly, reported and investigated with the generation of corrective actions as required.	Significant	Unlikely	**Low**
Water Management					
Storm water runoff management	Contamination of off site stormwater system due to discharge of water with high sediment load.	Runoff from disturbed areas is collected in sedimentation ponds or other sediment control devices (e.g. aggregate filter, vegetation buffer strips, wetlands) prior to being discharged from the site.	Serious	Unlikely	**Low**
Storm water runoff management	Contamination of off site stormwater system due to discharge of water with high sediment load.	Where practical, runoff is directed through a vegetation filter prior to reaching any watercourse to enable further filtering of sediment.	Serious	Unlikely	**Low**

Storm water runoff management	Contamination of off site stormwater system due to discharge of water with high sediment load.	The capacity of sediment traps, ponds, drains and banks are maintained to ensure excess sediment does not build up impacting final water quality.	Serious	Unlikely	**Low**
Storm water runoff management	Contamination of off site stormwater system due to discharge of water with high sediment load.	Settling ponds discharge into drainage lines that are stable and vegetated via properly constructed spillways, ripraps or culverts.	Serious	Unlikely	**Low**
Process water runoff management	Contamination of off site stormwater system due to discharge of water with high sediment load.	Process water and settling pond water is recycled for dust suppression, washing and promoting revegetation etc.	Serious	Unlikely	**Low**
Noise Management					
Quarry Operations	Non-compliance with state based legislative noise requirements.	Noise emissions from the site should not exceed permit conditions or State-based noise limits. Monitoring data is available to confirm compliance with noise requirements of licence and approval conditions.	Significant	Unlikely	**Low**
Quarry Operations	Neighbour complaints due to operational noise.	Solid barriers such as bund walls and topographical features are used to minimise noise transmission	Significant	Unlikely	**Low**
Quarry Operations	Neighbour complaints due to operational noise.	Access tracks and haul roads are well maintained to prevent corrugation that contributes to truck noise.	Significant	Possible	**Low**
Quarry Operations	Neighbour complaints due to operational noise.	Machinery is well maintained to reduce operational noise	Significant	Unlikely	**Low**
Spill Response					
Spill response	Contamination of land or water due to poor emergency response.	Spill response equipment is available and readily accessible in high-risk areas	Significant	Unlikely	**Low**
Spill response	Contamination of land or water due to poor emergency response.	A documented spill response procedure is in place and employees have been trained in its use.	Significant	Unlikely	**Low**
Spill response	Contamination of the offsite stormwater system due to flow of spilt substances.	During refuelling, nearby stormwater drain entry points are isolated to prevent any spilt substance entering the drain.	Significant	Unlikely	**Low**
Spill response	Contamination of land or water due to poor emergency response equipment availability.	Spill response equipment is regularly maintained including replacement of used equipment.	Significant	Unlikely	**Low**
Waste Management					
Waste Management	Generation of wastes due to cross contamination of waste types	Wastes are appropriately segregated (e.g.. oils separated from general refuse)	Significant	Rare	**Low**

Waste Management	Non-compliance with state based legislative waste requirements.	Wastes including waste oil, batteries, filters, coolant, tyres and scrap steel are suitably stored, labelled and disposed of or recycled at appropriately licensed facilities.	Significant	Unlikely	**Low**
Waste Management	Non-compliance with state based legislative waste requirements.	All transport and disposal practices meet State regulations including waste tracking where required.	Significant	Unlikely	**Low**
Waste Management	Generation of wastes due to poor housekeeping processes	All rubbish, equipment, structures and waste material is removed on a progressive basis from the premises and recycled wherever possible or disposed of at an approved disposal site.	Significant	Unlikely	**Low**
Waste Management	Generation of wastes due to poor housekeeping processes	Waste is stored in an area that will not contaminate any watercourse, waterway, groundwater, wetland or lake and soil.	Significant	Unlikely	**Low**
Waste Management	Generation of wastes due to poor housekeeping processes	Empty drums are stored in a designated hardstand area until collected for recycling.	Significant	Unlikely	**Low**
Waste Management	Generation of wastes due to poor housekeeping processes	Any leakage from empty drums is contained and not permitted to enter waterways or come into contact with soil.	Significant	Unlikely	**Low**

Attachment 4.2G - Environmental Risk Matrix

Step 1 - Consider the Consequence

What are the consequences of the most reasonable worst case scenario considering a credible failure of existing controls?

Consequence	Disaster	Severe	Serious	Significant	Minor
Environment On Site & Off Site	Major event, unconfined impact, severe permanent damage with low likelihood of recovery.	Significant permanent damage; reversible damage with recovery time of years; high potential for prosecution	Minor permanent damage; temporary damage that is widespread or that has moderate impact	Damage that is near source confined, temporary and minor	No measurable damage to environment
Compliance With Legal and Other Requirements	Blatant or serious breech of legal requirement, leading to operation being suspended or severely reduced. Prosecution expected.	Breach of external requirement (license, legislation, regulation, contract etc) with high potential for prosecution and/or high impact.	Non-compliance with external requirement with moderate potential for impact.	Repeated non-compliance with internal procedure, non-compliance with external requirement with low potential impact	Minor non-compliance with internal procedures.
Community Perception and Reputation	Significant adverse media attention (state or national level), loss of reputation or work nationally or across product groups.	Prosecution, significant impacts on social license to operate, loss of reputation or ability to secure work across product groups.	Local adverse media attention, loss of reputation or ability to secure work in local area, complaints that result in changes to external requirements.	Multiple community complaints or complaints that require changes to internal operating procedures.	Community complaint resolved with no changes to existing operating procedures.

Note: Temporary environmental damage has a duration of up to approximately one week to rectify

Step 2 - Consider the Likelihood

What is the likelihood that the proposed consequence will occur with a credible failure of existing controls?

Likelihood	Certain	Likely	Possible	Unlikely	Rare
Description	Event that is expected to occur on multiple occasions	Event that is likely to occur at least once	Event that may occur	Event that is unlikely to occur	Event that may occur only in exceptional circumstances
Frequency	Event is likely to occur more than twice a year.	Event is likely to occur once or twice a year.	Event is likely to occur more than once or twice in a 10 year period	Event is likely to occur once or twice in a 10 year period	Event is likely to occur once or twice in a 100 year period

Step 3 - Determine Risk Rating from the Risk Matrix

Liklihood	Consequence				
	Disaster	Severe	Serious	Significant	Minor
Certain	High	High	High	Medium	Medium

Likely	**High**	**High**	**Medium**	**Medium**	**Low**
Possible	**High**	**Medium**	**Medium**	**Low**	**Low**
Unlikely	**Medium**	**Medium**	**Low**	**Low**	**Low**
Rare	**Medium**	**Low**	**Low**	**Low**	**Low**

Appendix 5

DUST Management Procedure

Purpose

The purpose of this process guide is to give direction to all personnel at the Pakenham quarry as to the methods and procedures for reducing the emission of airborne dust

Scope

This guide is to be followed by all Personnel & Contractors without exception. The quarry manager is responsible for the implementation & maintenance of this procedure.

Responsibilities

Position	Responsibility
Quarry Manager	• Owner of this procedure and must ensure all personnel and contractors are aware and understand their roles and responsibilities. • Monitor PM10 live data through dashboard • Ensure dust monitoring activities are in compliance with EMP • Report any exceedances through ICARE and the ERC and put mitigation strategies in place
Production Manager	• Monitor PM10 live data through dashboard • Monitor and control dust emissions from fixed plant • Monitor and control dust emissions from stockpiling and material handling activities. • Minimise spillage and apply good housekeeping practices • Report any maintenance items related to dust control devices around site (both fixed and mobile) • Ensure all running plant inspections are complete to track performance of dust control devices. • Ensure plant housekeeping is kept to a high standard • Ensure all doors to sheds are closed during normal operation
Quarry Supervisor	• Monitor and control dust emissions from all load and haul activities (including stripping / overburden removal and placement) • Ensure minimum safety hardware checklists are completed, on drill rig arrival to site to assess dust extractor operation • Ensure drill rig operators are using their dust extractors • Report any maintenance items related to dust control devices

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	around site (both fixed and mobile)
Position	**Responsibility**
Maintenance Manager	• Ensure all dust control assets (both fixed and mobile) are maintained according to OEM or Holcim SHE requirements • Maintain equipment maintenance history for all dust control devices (sprays / extraction units/ filter units) • Maintain all spillage control equipment (scrapers etc) around site • Ensure plant housekeeping is maintained to a high standard
Maintenance Supervisor	• Ensure all doors to the crusher buildings are closed post maintenance activities • Maintain adequate stock of dust spray replaceable parts • Ensure Plant housekeeping is maintained to a high standard • Execute maintenance plan for dust control devices
Fixed plant operators	• Ensure adequate sprays are applied during the day to control dust • Report on any defects of dust control equipment • Maintain plant housekeeping to a high standard • Report on any spillage • Ensure all access doors are closed during operation • Complete fixed plant running maintenance inspections
Mobile plant operators	• Apply stockpile sprinklers • Apply haul road sprinklers • Apply sprinklers around final screenhouse • Report on any faults relating to sprinkler systems or dust control systems • Operate machine in a safe and efficient manner
Water Cart operator	• Operate water cart safely and efficiently inline with the SWP
Weighbridge Operator	• Monitor operation of the wheel wash and report on any defects or drag out • Report any faults relating to the wheel wash for rectification

In the event that airborne dust cannot be controlled due to extreme weather conditions or equipment failure, each of the roles listed above can call for the cease of dust generating operations until such time they can be adequately controlled.

Appendix 5

Fixed Plant Dust control measures.

To control dust that is generated from the fixed plant , the Quarry has a number of devices including water sprays, dust extractors, and silo venting filters. Each item is controlled via the plant automation system.

Stacking conveyors

Stacking conveyors should be lowered as necessary to minimise drop heights of material especially when it is dry material

Extraction Systems

Tertiary Dust collector: - 5385-331-BF01

This dust collector is located at the rear of the Tertiary building. It collects fine dust from BC09, VI03 & CZ04 and deposits it into the Tertiary wedge pit for collection from a front end loader. It is operated remotely and turns off and on automatically when the Tertiary startup/shutdown sequence is initiated.

It is has a preventative maintenance program and all service history and repair logs are maintained in the Maintenance Managers office

Blending Plant Dust collector: - 5385-361-BF02

This dust collector is located on the side of the pugmill building. It collects dust from the pugmill box and deposits it into a skip bin. It is controlled automatically when the pugmill is operating.

It is has a preventative maintenance program and all service history and repair logs are maintained in the Maintenance Managers office

Silo vent filter: - 5385-361-3B01

The cement silo has a filter unit on it and operates automatically during the pump in process.

It is has a preventative maintenance program and all service history and repair logs are maintained in the Maintenance Managers office

Appendix 5

Dust Spray Systems

In the table below describes the location and the method of operation for the water sprays in the fixed plant.

Plant ID	QTY	Location description	Method of operation
JC01	4	Feed chute	Solenoid control
CZ02	3	Head chute	Solenoid control
BC05	2	Head chute	Solenoid control (operates of CZ02 control)
BC06	2	Transfer point CZ02/BC06 Ring spray in head chute	Operates off CZ02 Solenoid Operates off BC06 Solenoid
BC07	1	Inside surge tunnel	Operates off BC07 Solenoid
BC09	2	Inside Tertiary building Outside Tertiary building	Both on BC09 Solenoid
BC10	1	Outside screenhouse	Operates on BC10 solenoid
BC15	1	Inside screenhouse	Operates on BC16 solenoid
BC16	2	Head chute of BC16 Transfer point BC15/BC16	Operates on BC16 solenoid
BI03	1	Underneath clam shell	Automatic activation upon bin opening
BI04	1	Underneath clam shell	Automatic activation upon bin opening
BI05	1	Underneath clam shell	Automatic activation upon bin opening
BI06	1	Underneath clam shell	Automatic activation upon bin opening
BI07	1	Underneath clam shell	Automatic activation upon bin opening
BI08	1	Underneath clam shell	Automatic activation upon bin opening

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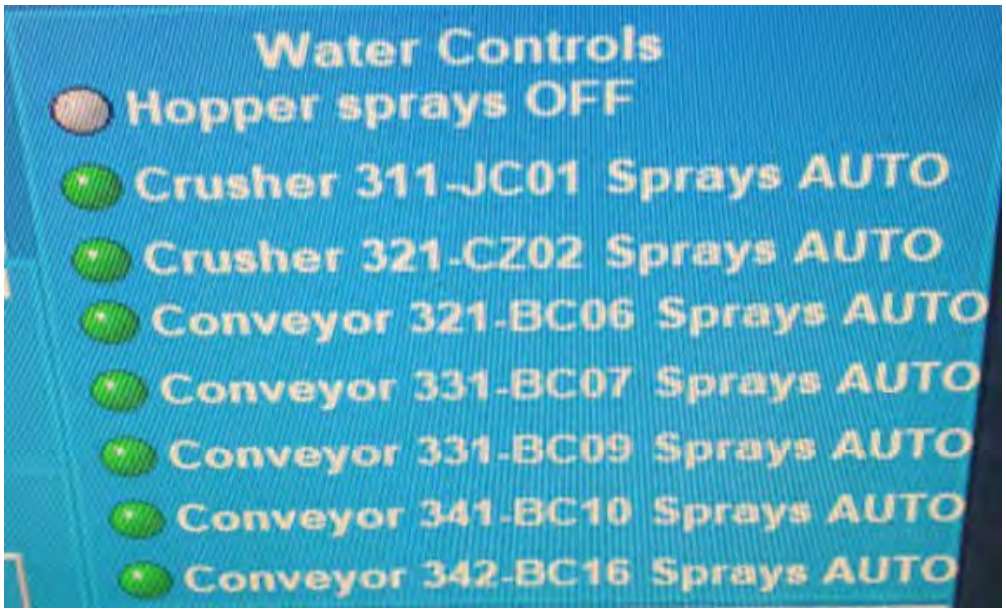
BI09	1	Underneath clam shell	Automatic activation upon bin opening
BI10	1	Underneath clam shell	Automatic activation upon bin opening
BI11	1	Underneath clam shell	Automatic activation upon bin opening
BI12	1	Underneath clam shell	Automatic activation upon bin opening

Operation of sprays

Depending on the weather and the in situ moisture of the raw material, the operator will turn on the required amount of sprays to minimise airborne dust. This will vary during the day and additional sprays may need to be activated or deactivated.

The sprays are turned on or off by clicking on the respective icon on the automation package as shown below.



When the sprays are activated in 'AUTO', they will turn on and off automatically depending on the % load on the conveyor or crusher so as not to over/under supply the water. This must be the standard mode of operation.

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Getting the correct amount of water added is critical as excess water can create spillage and product quality problems, and too little or no water can potentially cause exceedances of compliance limits.

It is the responsibility of the plant operator to adjust / activate or deactivate sprays during the production shift in consultation with the Production or Quarry Manager

The flow to each spray can be adjusted by a manual valve, however sprays are not to be turned off at the valve without the approval of the Production manager.

Walk around inspections should occur during the production shift to review and monitor performance of the sprays. Any defects are to be reported so that corrective maintenance can be performed.

Aggregate Bin sprays

Operation of the sprays from BI03 - BI12 are supplied by the blending plant water tank, and are controlled via the bin truck control panel.

When the operator drives under a bin and presses the open button for the bin, the sprays come on automatically and shut off when the loading process is complete. Below is an example of the Recrush dustbin sprays in operation.

Appendix 5

Fixed sprinklers

The site has a number of fixed sprinklers in key areas where potential dust generations are likely to be higher than other areas. This also coincides with high traffic areas to help reduce the risk of a collision. See the map below for locations. Further information on the operation and responsibilities of these are described below

Haul road sprinklers:

There are a number of sprinklers that run from the Level 2 hold point along to the Boot, these are fed via a pump in the south dam. It is the responsibility of the load and haul team to activate these as required. The locations of these are shown in blue.

Low Road sprinklers:
These sprinklers are fed from the tank and the truck body wash, it is the responsibility of the sales loader operators and or bin truck operator team to operate these as required.

Aggregate stockpile sprinklers:
These sprinklers are fed from WP3 in the primary switchroom, the valve to operate these is behind the tank at the truck body wash it is the responsibility of the sales loader operators to turn these on.

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Watercart Operations:

The site watercart is a key asset in the dust management process. It is currently a Caterpillar 740 articulated water truck. The safe and efficient operation of this machine is defined by PAKSWP13 ' Articulated water cart operations'

The water trucks sole purpose is to spray water on roads/stockpiles/Quarryfaces where there is no fixed dust suppression system.

The watercart is equipped with batter sprays, water cannon and rear sprays and when correctly operated provide adequate dust suppression.

Depending on the level of site activities, (eg, overburden removal) a 2nd water cart may be required.

On days of severe weather such as hot and dry winds, the water cart is to be relieved during the day.

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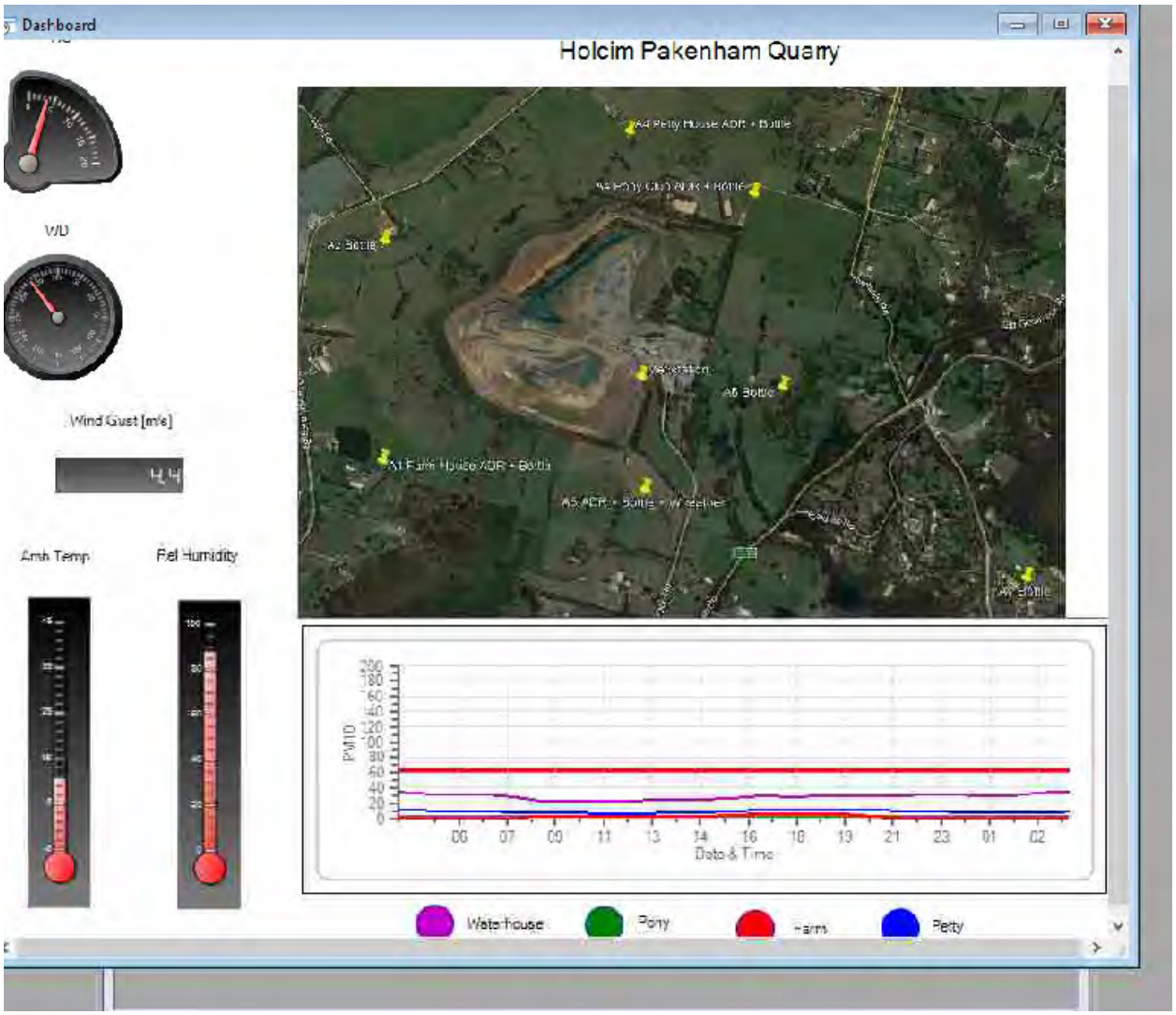
Appendix 5

Monitoring controls

All management/supervision staff have access to view live PM10 data through the consultant's online portal.



In the event that the trending is showing a potential reactive exceedance (greater than 64µm^3/hr, then immediate action must be taken and entered into INX. Any exceedances need to be discussed in the next pre-start toolbox talk and SIT meeting

Appendix 5

Spillage through the plant is monitored and actioned based on the weekly fixed plant inspections and hazard and housekeeping inspections.

In the event due to equipment failure or extreme weather conditions where airborne dust cannot be adequately controlled, the site shall reduce the level of activities (i.e load and haul or crushing and screening) until such time the airborne dust can be controlled.

Landscape & Rehabilitation Management Plan

Mt SHAMROCK QUARRY,

PAKENHAM

July 2021

Appendix 6

CONTENTS

Attachments

1. Quarry Operational Area – Rehabilitation Plan – Dwg. L1a,
2. Non-quarry Operational Area: Landscape Plan Planting Phase A – Dwg. L2a,
3. Non-quarry Operational Area: Landscape Plan Planting Phase B – Dwg.L3a, and
4. Non-quarry Operational Area: Landscape Plan Planting Phase C – Dwg.L4a,

1.0 INTRODUCTION

This Landscape & Rehabilitation Management Plan (LRMP) has been prepared as part of the rehabilitation strategy for the extension of the Holcim Mt Shamrock Quarry. It is designed to specifically address issues relating to maintenance activities associated with landscaping and rehabilitation of quarry and non-quarry operational areas, as identified in section 9 of the Landscape and Rehabilitation Report appended to the Work Plan for the variation to Work Authority No. 174 submitted as part of the Environmental Effects Statement for that variation prepared in May, 2005.

A planning permit was issued to Holcim in June, 2007, allowing the extension to proceed subject to conditions. It is a requirement of the planning permit that an Environmental Management Plan (EMP) be prepared which will incorporate the management requirements for the site. As part of the EMP, the following landscape and rehabilitation management strategies and monitoring systems in this LRMP are outlined for incorporation within the EMP implementation program.

This LRMP complements, and should be read in conjunction with, ERM's Landscape and Rehabilitation Report (January, 2005) appended to the Work Plan in Volume 1 of the Technical Supplement to the EES.

1.1 Summary of Landscape and Rehabilitation Strategy

Rehabilitation will respond to each of the four stages of extraction to treat batters, benching, quarry floors, plant, hardstand and stockpile areas, and water collection points (wetlands). At the completion of all quarrying activities, it is proposed that the site be reviewed to ascertain plant losses. Replanting as part of the ongoing monitoring and maintenance will continue for a period of **12 months** after completion of extraction, after which the planting will rely on natural regeneration.

1.2 Accompanying Drawings

This LRMP is to be read in conjunction with the following plans of the development prepared by ERM for Mt Shamrock Quarry:

5. Quarry Operational Area – Rehabilitation Plan – Dwg. L1a,
6. Non-quarry Operational Area: Landscape Plan Planting Phase A – Dwg. L2a,
7. Non-quarry Operational Area: Landscape Plan Planting Phase B – Dwg.L3a, and
8. Non-quarry Operational Area: Landscape Plan Planting Phase C – Dwg.L4a,

as amended to comply with planning permit Condition 8. The amended complying plans are attached to this LRMP.

1.3 Guidelines

It is the responsibility of the quarry operators to ensure that they are aware of legislation, guidelines and other relevant requirements relating to their activities. It is also the responsibility of the operator to ensure that the requirements of legislation and the particular requirements of this LRMP are followed throughout the construction / planting rehabilitation, management phases of the project.

1.4 Local Ordinances

Works on site shall comply with all Corporations, Municipal, or other Local By-Laws and Regulations.

1.5 Codes, Standards, Permits and Regulations

All work shall comply with current relevant Codes, Australian Standards, Permit requirements and Regulations currently in operation for the respective works types.

2.0 MONITORING, REPORTING & REVIEW

2.1 Rehabilitation Manager

A Rehabilitation ("Rehab") Manager is to be appointed with responsibility for the following:

- Ensuring any contractors and staff are aware of the LRMP and its requirements;
- Carrying out any monitoring, testing and corrective actions;
- Reporting and reviews as specified in this LRMP;
- Land management practices undertaken;
- Rehabilitation works completed;
- Complaints received and properly recorded and actioned;
- Non-conformances and corrective actions; and
- Results of site inspections.

The Rehab Manager may change as the project progresses through the detailed design, quarrying/planting stages, to the on-going management phases, during rehabilitation.

2.2 Reporting

The Rehab Manager will submit land management reports to the Quarry Management on a 6 monthly basis during the quarrying phase. These reports will summarise the implementation of the LRMP and will include:

- Land management practices undertaken
- Rehabilitation works completed
- Complaints received
- Non-conformances and corrective actions
- Results of site inspections
- Results of water quality testing.

and consider environmental impacts and processes including:

- Health of existing indigenous vegetation
- Recruitment of indigenous vegetation into rehabilitation areas
- Weed invasion
- Erosion
- Water Quality.

Land management reports should be prepared every two years from the commencement of rehabilitation. These reports will include:

- Land management practices undertaken
- Health of existing indigenous vegetation
- Recruitment of indigenous vegetation into rehabilitation areas
- Complaints received
- Non-conformances and corrective actions
- Results of site inspections and water quality testing
- Proposed alterations to the LRMP in line with the current best practice.

2.3 Complaints Register

Any complaints received from the public regarding land management issues associated with the conservation and rehabilitation components of the quarry's activities will be entered and retained in the ICARE 2.0 electronic incident database. The minimum details to be recorded will include:

- Date and time of alleged incident.
- Nature of the complaint.
- Name, telephone and address of the complainant.
- Investigation or actions initiated.
- Response / mitigation measures undertaken / additional monitoring.

The ICARE 2.0 electronic database will be kept throughout the quarrying, planting and rehabilitation and ongoing land management phases.

2.4 Non Conformance and Corrective Actions

Non-conformances may be identified through the process of monitoring, the complaints register, site inspections and site audits or through the LRMP review process. It is the responsibility of the Rehab Manager to ensure that these non-conformances and required corrective actions are documented and corrective actions implemented within a reasonable time frame.

2.5 Soil Testing

Where testing of soils for contaminants is indicated, sampling will be done by trained personnel and analysis conducted by an analytical laboratory that is NATA accredited for each analysis. Results will be evaluated against the requirements of State Environment Protection Policy (Prevention and Management of Contamination of Land) and any associated standards referenced in the SEPP (as applicable).

2.6 LRMP Review

It will be necessary to review and revise the LRMP to ensure that it contains up to date and relevant land management practices during the course of the rehabilitation. The Quarry Manager and nominated management personnel will review the LRMP prior to commencement of each stage of the rehabilitation operations, and annually thereafter following the LRMP reports outlined above.

All reviews will be documented, records maintained and both record of reviews and minutes of review meeting(s) will be retained. A summary of the outcomes of each review will be

communicated to all relevant staff. A copy of the draft reviewed LRMP will be submitted to the Environmental review Committee (ERC) for its comments before finalisation.

3.0 SITE AND SURROUNDS

3.1 Location

The Mt Shamrock Quarry is located approximately 5km to the north of Pakenham township. The site is accessed from Mt Shamrock Road. The work authority incorporates approximately 122Ha with areas surrounding the quarry generally cleared and used for rural lifestyle purposes.

3.2 Vegetation

Vegetation selected for rehabilitation in the quarry operation includes species listed under the following EVC classifications (EVC Mapping of Port Phillip and Westernport):

EVC16 – Lowland Forest
EVC45 – Shrubby Foothill Forest
EVC128 – Grassy Forest

Refer Biosis Report Proposed Extension of the Mt Shamrock Quarry, Pakenham: Vegetation and Habitat Assessment (Ecology), February, 2005.

4.0 OPERATIONAL MANAGEMENT STRATEGIES

The purpose of these strategies is to provide a practical system for the ongoing management of the site. They are used to achieve the following objectives:

- To ensure that vehicles entering or leaving the site do not contaminate or spread weed seeds to either this site or to other properties;
- To conserve the existing conservation areas.

4.1 Vehicle Management

Adopt the following practices to lessen the possibility of importing or exporting weed seeds on vehicles entering or leaving the site.

Vehicles working exclusively within the extractive limit area do not have to be inspected or washed down. The following recommendations are based upon a set of similar recommendations within the 'Queensland Guideline for limiting weed seed spread', *Queensland Weed Seed Spread Project*, July 2000, p5-6.

Machinery, vehicles and equipment in the following recommendations refers to equipment used during:

- Rehabilitation works / clearing / farm operations.
- Vehicles involved in land management. (Patrolling tracks, tractors and farm equipment).

It is **not** the intention of this guideline to include vehicles that simply travel from constructed asphalt roads to the quarry.

4.1.1 Inspection of Vehicles

- Inspection of machinery and vehicles coming from infested or unknown areas
- Determine inspection requirements for vehicles, machinery and equipment moving between jobs, districts
- Request that all contract vehicles and machinery are inspected prior to arrival on site
- Develop inspection procedures and locations to suit industry and environmental requirements
- Establish and maintain a checklist for vehicles, machinery and equipment inspected.

4.1.2 Clean Down of Machinery, Vehicles and Equipment

- Determine appropriate cleaning practices for vehicles, machinery and equipment moving between jobs, districts
- Clean down machinery, vehicles and equipment from contaminated or unknown areas in accordance with established practices above, prior to arrival on site
- Clean down all machinery before departing site, at an on-site clean down facility
- Clean down facilities away from water courses, in an area that can be monitored for future germination, are available at the site workshop.
- Avoid moving machinery in wet conditions where clay removal is difficult
- Develop work practices which avoid contamination of vehicles and machinery and prevent the spread or introduction of additional weed seeds. Ensure contractors conform to these practices
- Develop remedial action plans for controlling isolated weed outbreaks that occur within the work project area.

4.1.3 Use of Public Roads and Pathways

Where public roads and pathways are used, the Rehab Manager shall ensure they are maintained free of earth, rock or other materials that may fall from plant and equipment. All such material dropped onto public roads and pathways shall be properly removed and cleared.

4.1.4 Provision of Public Safety

The Rehab Manager shall ensure adequate provision is made for the safety of the public by providing suitable temporary barriers, fencing, ramps, warning signs, lighting and any other protective devices at all locations of potential risk.

All necessary measures shall be taken to protect the health of persons on or within the vicinity of the site from conditions that are or may be dangerous to health, including the noxious effect of dust, fumes, or other hazards.

4.2 Topsoil Scraping and Stockpiling

Existing site topsoil that is to be re-used on site shall be stockpiled within the works boundary, in an area that will not be subject to traffic or other compaction. The stockpile is not to be located on areas of native vegetation to be retained, or within the drip-line of existing trees.

Consideration should be given to bulkage factor, settling and some natural spreading of the topsoil into adjacent areas. The stockpile will be limited to <2m high.

4.3 Weed and Vermin Control

A weed control program will be implemented focusing on noxious weeds utilising a combination of knock-down and pre-emergent herbicide . Noxious weed eradication in the area to be planted will be an ongoing requirement.

During the plant establishment and maintenance phase, weeds will be kept clear of individual plants through the use of a mulch ring and spot spraying. The mulch shall be located within a diameter of 1m of tree seedlings. *Refer Quarry Operational Area – Rehabilitation Plan – Drawing L1a.*

The following weed species are based on site observations, existing management practises. The threat rating is taken from the 2019 Cardina shire weed management strategy

Scientific name	**Common name**	**State classifications (where listed in a noxious weed category)**	**Cardinia Shire Threat rating (2019) **Threat rating (Low, Medium, Medium High, High, Very high)**
Anthoxanthum odoratum	Sweet Vernal-grass		
Arctotheca calendula	Cape Weed		M
Allium triquetrum	Angled Onion	R	H
Brassica fruticulosa	Twiggy Turnip		
Bromus sp	Bromus species		
Cirsium vulgare	Spear Thistle	Noxious (RC)	MH
Cratageus monogyna	Hawthorn	Noxious (RC)	H
Cynodon dactylon var. dactylon	Couch		
Cyperus erogrostis	Drain Flat-sedge		M
Cortaderia selloana	Pampas Grass		H
Dittrichia graveolens	Stinkwort		
Dactylis glomerata	Cocksfoot		
Ehrharta erecta	Panic Veldt-grass		H
Erica lusitanica	Spanish Heath		VH
Erigeron bonariensis	Tall Fleabane		
Erigeron spp	Fleabane		
Festuca arundinaceae	Tall Fescue		
Galium aparine	Cleavers		H
Genista linifolia	Flax-leaf Broome	Noxious (RC)	VH
Genista monspessulana	Montpellier Broome	Noxious (RC)	VH
Hedera helix	English Ivy		VH

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Helminthotheca echioides	Ox-tongue		
Holcus lanatus	Yorkshire Fog		H
Hypochaeris radicata	Cat's Ear		
Lonicera japonica	Japanese Honeysuckle		VH
Malva nicaeenis	Mallow-of-Nice		
Onopordum acanthium ssp. acanthium	Scotch Thistle		
Oxalis Pes-carpae	Soursob	R	VH
Paspalum dilatatum	Paspalum		
Phalaris aquatica	Toowoomba Canary-grass		L
Plantago lanceolata	Ribwort		
Polygonum arenastrum	Wireweed		
Raphanus raphanistrum	Wild Radish		
Solanum nigrum s.l	Black Nightshade		
Sonchus asper ssp. asper	Rough Sow-thistle		
Sonchus oleraceus	Sow-thistle		
Ranunculus repens	Creeping Buttercup		VH
Rubus fruticosus spp. agg.	Blackberry	Noxious (RC) WONS	VH
Salix cinerea	Willow	WONS, R	VH
Senecio jacobeana	Ragwort	Noxious (RC)	MH
Silybum marianum	Variegated Thistle		
Solanum nigrum	Black Nightshade		M
Ulex europeas	Gorse	Noxious (RC), WONS	H

All methods of control should be selected having regard to current best practice, published guidelines and (as required) in consultation with DSE staff.

Please see table below for control method and approximate timing for weed and vermin control

Species	Control Method	Timing
Blackberry	Spraying	December - April
Broom	Spraying	Spring
Thistle	Spraying	September
Ragwort	Spraying	November / December

Pampass grass	Spraying	July / August
Pitossporum	Cut & Paint	Autumn
Rabbits	• Warren destruction • Fumigation • Ripping	• Spring • Spring • Spring
Foxes	Fumigation	Spring

Records will be kept to monitor the location, type and extent of all weed infestation. Used as a reference, these records can be used over time to establish the most appropriate and effective means of control for this site.

4.3.1 Herbicide Use

Any areas to be planted, which have been colonised by noxious weed species, should be herbicide treated with a non-residual knock-down herbicide at a minimum of twice prior to planting.

Where it has been shown that a residual knock-down herbicide is more effective than non residual herbicide, justification of its use must be provided to the Rehab Manager prior to use.

Spraying of herbicides is not recommended near drainage lines. It is recommended that cut and paint methods be used on woody weeds in these areas.

NOTE: The application of herbicides must be undertaken by a contractor or trained quarry personnel with a valid licence, Agricultural Chemical Users Permit (ACUP) as required, and in accordance with the manufacturer's recommendations for concentration of herbicide and frequency of application.

4.4 Existing Vegetation Management

Aside from control of weed species as listed above, maintenance should include:

- Monitoring health of retained and planted vegetation and checking for pests and diseases,
- Treatment of disease or other infestation in vegetation, as necessary and as approved in consultation with DSE, and
- Control of pest animal species.

Management measures include:

- Dead or fallen timber should not be moved from the site, as it may form breeding or roosting habitat for native fauna, or a source of food for birds or invertebrates.

- Protect vegetation liable to damage with suitable temporary guards or protective enclosures for the duration of work under the contract and remove once all planting

is completed. Enclosures should be at a minimum on the outer edge of the canopy drip line for trees and at the boundary of zones as shown on the drawings or confirmed on site.

- To protect existing vegetation, take necessary precautions, including the following:
  - Do not store, stockpile, dump or otherwise place under or near vegetation any bulk materials or harmful materials such as oil, paint, other chemicals, excavated material, even if for short periods.
  - Prevent wind blown materials, such as cement, from harming vegetation.
  - Prevent damage to tree bark.
  - Do not attach stays, guys and the like to existing trees.
  - Do not remove topsoil from within the drip line of trees unless otherwise specified. If it is necessary to excavate within the drip line, use hand methods such that root systems are preserved intact and undamaged. Open up excavations under tree canopies for as short a period as possible.
  - Do not cut any roots exceeding 50mm diameter unless permitted by the Rehab Manager. Where it is necessary to cut tree roots, use a chainsaw or similar means so that cutting causes minimal disturbance. Immediately after cutting, paint roots with an approved root-inducing hormone.

- Avoid compaction of the ground, especially under trees. If the soil does become compacted loosen by coring 40 mm diameter holes 450 mm deep at 600 mm centres. Backfill holes with coarse river sand mixed with slow release fertiliser and water in.

4.5 Seed Collection

Seed collection from on-site indigenous vegetation is to be undertaken by a qualified specialist in indigenous revegetation. Collected seed will be supplemented by seed collected off-site. Supplementary seed must be sourced locally, and be collected in accordance the necessary permits. *Refer to the DSE Landcare Notes and Information Series for guidelines on seed collection, labelling, drying, and storage.*

Collection should conform to the requirements of any necessary permits, and collection should not exceed more than 5% of available cutting material or 10% of the seed on any one plant, from a maximum of 25% of the plants of that species in the area; this will ensure that sufficient quantities of seed are left as a food source for local insects and small animals, and that enough seed remains to allow for natural regeneration.

Manual collection methods should be used unless other methods can be applied to appropriate species with minimal disturbance to the existing vegetation.

Only mature fruit should be gathered; immature fruits, buds and flowers should be left to ripen. Seed should not be gathered from isolated specimens or very small vegetation stands. At no time should the viability of the existing vegetation community to regenerate be put at risk.

Sufficient time must be allowed for seed collection, as species ripen at different times throughout the year, and poor seasonal weather may limit availability of certain species.

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Collection of seed from all species listed below may take a period of up to two years.

Trees	
Manna Gum	*(Eucalyptus viminalis)*
White Messmate	*(Eucalyptus globiodea)*
Swamp Gum	*(Eucalyptus ovata)*
Messmate Stringybark	*(Eucalyptus obliqua)*
Narrow-leafed Peppermint	*(Eucalyptus radiata)*
Green Scentbark	*(Eucalyptus fulgens)*
Swamp Paperpark	*(Melaleuca ericifolia)*
Scented Paperbark	*(Melaleuca squarrose)*
Blackwood	*(Acacia melanoxylon)*
Silver Wattle	*(Acacia dealbata)*
Myrtle Wattle	*(Acacia myrtifolia)*
Common Dogwood	*(Cassinia aculeate)*
Shrubs	
Woolly Tea-Tree	*(Leptospermum lanigerum)*
Common Heath	*(Epacris impressa)*
Yellow Hakea	*(Hakea nodosa)*
Golden Bush-Pea	*(Pultenea gunni)*
Hedge Wattle	*(Acacia paradoxa)*
Grasses, Sedges and Groundcovers	
Tall Sedge	*(Carex appressa)*
Knob Sedge	*(Carex inversa)*
Kidney weed	*(Dichondra repens)*
Black Anther Flax Lily	*(Dianella revolute)*
Rough Tree Fern	*(Cyanthea australis)*
Common Ground Fern	*(Calchlaena dubia)*
Hop Goodenia	*(Goodenia ovata)*
Sword Tussock Grass	*(Poa ensiformis)*
Common Tussock Grass	*(Poa labillardieri)*
Grey Tussock Grass	*(Poa seiberiana)*

Quantities collected are to be determined by the collector, taking into account:

- seasonal condition
- timing of works
- available seed
- required density of seeding and seed viability of each species
- the area to be rehabilitated.

4.6 Topsoil Spreading

Existing site topsoil, sourced from onsite stockpiles established prior to excavation, will spread over the quarry floor to a minimum depth of 200mm to provide a growing medium

for indigenous vegetation and exotic grasses. Timing is to be determined to maximise the viability and germination of the indigenous seed collected and minimise weed invasion.

4.7 Hydro- Seeding

Hydro-seeding or other soil stabilisation/seeding/mulching methods should be undertaken by a qualified specialist in indigenous revegetation, in consultation with Landscape Contractors. Timing is to be coordinated with the spreading of topsoil, to maximise the viability and germination of the indigenous seed collected and minimise weed invasion.

Typical species used in the hydroseeding process shown in the table below

Common Name	Scientific name
Common Wallaby Grass	*Rytidosperma caespitosum*
Bristley Wallaby Grass	*Rytidosperma setaceum*
Racesmosum	*Rytidosperma racesmosum*
Tussock Grass	*Poa labillardierii*
Weeping Grass	*Microlaena stipoides*
Kangaroo Grass	*Themeda triandra*

4.8 Setting Out Works

Holcim shall be responsible for accurately setting out the works prior to breaking any soil and for checking the works in progress.

4.9 Fencing and Signage

A cyclone mesh fence is to be located at the perimeter of the proposed Works Authority Boundary. Signage is to be compliant with industry standards

4.10 Supervision

The Rehab Manager or nominated quarry staff shall be present at the site of works at all times. Nominated representatives shall have had experience in executing work equal in nature and magnitude to the work described in this Plan.

Contractors shall designate in writing to the Quarry Manager the name of their approved representative who shall have authority to direct work and to whom site instructions will be given by the Quarry Manager of their nominee.

Contractors shall also designate how they will have authority over any subcontractors, and who will issue instructions to any subcontractors.

Contractors shall keep one full set of drawings and specifications on site at all times to be available for inspection by the Rehab Manager or his/her nominee, or Inspectors from authorities with jurisdiction over the works. The drawings shall be adequately protected to sustain the documents in a clear and readable form for the duration of the works.

4.11 Cleaning Up

All equipment and debris will be removed from the site at the completion of each stage of planting. The site shall be left tidy. During the implementation of planting, piles of rubbish shall be removed leaving the site in a tidy condition at the end of each working day.

4.12 Erosion Control

Areas susceptible to erosion will be treated with approved erosion control techniques. The specific technique will be dependent on site conditions but may include hydro-mulching, erosion control matting or other approved techniques. *Refer to EPA Guidelines, eg. "Doing it Right on Subdivisions", Publication No. 960, September, 2004.*

4.13 Maintenance during Plant Establishment Period - 52 weeks

Maintenance during the Plant Establishment Period should include the care of the landscaped areas by accepted horticultural practices, as well as rectifying any defects that become apparent in the works. This shall include, but shall not be limited to, the following items where and as required:

- Weed control,
- pest management,
- replacement of plants,
- monitoring of fences & signs,
- cultivation, and
- maintaining the site in a neat & tidy manner.

5.0 ONGOING & POST OPERATIONS MANAGEMENT

Holcim shall continue to monitor and maintain the site, however, plant replacement will be undertaken solely for visual screening reasons. The landscape will operate as a "natural" system and is expected to be self-sustaining, similar to surrounding forest environments.

Ongoing maintenance, monitoring and rectification will include, but will not be limited to:

- Maintenance of the surface of site access tracks
- Maintenance of all fences and signage
- Pruning branches overhanging and imposing on access tracks

- Monitoring and control of weeds as necessary, ensuring weed controllers have attended a DSE 'Farm Chemical User Course' or equivalent and have appropriate ACUP and other relevant permits
- Monitoring health of retained and planted vegetation and checking for pests and diseases
- Monitoring stability of berms and berm walls
- Replant terrestrial planted areas which that have failed and provide significant gaps in the horizon line
- Future plantings will include Multi story / multi species to provide a more natural ecosystem
- Re-grading necessitated by erosion, washouts
- Treatment of disease or other infestation in vegetation, as necessary and as approved in consultation with DSE.
- Control of pest animal species.

If the site is sold in the future, the responsibility for ongoing maintenance should form part of the contract of sale.

6.0 CONCLUSION

The LRMP is a flexible document that allows for the continued monitoring and improvement of land management and remediation strategies throughout each stage of quarrying. Its use, together with good site management practices, should ensure successful rehabilitation of this site.

Attachments

Appendix 7 –Noise Management Plan

Site:	***Pakenham Quarry***
Completed by:	***D. Vardy [Area Manager] & G. Pirie [Environment manager Vic/SA/Tas]***
Date Completed:	***April 2014***

Performance Standard	■ Comply with all limits specified in permit and approval requirements ■ Comply with all requirements contained within SHE Guideline 6.09 Noise ■ Minimise noise emissions at all times.
Significant Noise Sources	■ Raw material transfer (FEL & conveyors) ■ Delivery of raw materials (tipping in bins) ■ Maintenance Activities ■ Vehicle movement (on and off site) ■ Compressors, Pumps and Ancillary Equipment ■ Crushing & Screening Plant ■ Drilling, Blasting & Secondary Breakage

Item	Control Measure	Persons Responsible	Review Frequency
Induction Training:	■ Provide and/or reinforce induction requirements for staff & visitors to ensure the relevant requirements and objectives of the Noise Management Plan are known and understood.	All staff & visitors	Daily
Drilling, Blasting & Secondary Breakage	■ Blasting activities to be carried out in accordance with blasting procedure. ■ Operations will occur during operating hours specified in licencing conditions only. ■ Where noise levels from drilling, blasting and secondary breaking are excessive despite existing controls, engage specialist engineering advice regarding suitable noise barriers or enclosures.	Quarry Supervisor	Complete on a risk basis

Material Transfer:	■ Where noise levels from bin gates, batch buckets, conveyors etc are excessive, engage specialist engineering advice regarding suitable noise barriers or enclosures.	Production Manager	Complete on a risk basis
Maintenance Activities:	■ Maximise the separation distance between noise generating activities and sensitive receivers. ■ Relocate the activity if possible. ■ Consider completing the task off site where possible.	Maintenance Manager & Contactors	Complete on a risk basis
	■ Maximise noise shielding by utilising existing structures ie. Buildings ■ Carryout the activity in a location that uses existing structures as noise barriers.	Maintenance Manager & Contactors	Complete on a risk basis
	■ Use maintenance techniques that generate less noise (cut with oxy gas equipment rather than angle grinder where appropriate, nylon capped hammers rather than steel hammers, pneumatic tools in preference to electric tools, etc)	Maintenance Manager & Contactors	Complete on a risk basis
	■ Plant and equipment to be inspected regularly to ensure that they are in good working order. ■ Immediately carry out repairs or maintenance on any plant and equipment that is generating unacceptable noise levels. ■ Ensure all noise mitigation measures are located correctly and are well maintained.	Maintenance Manager & Contactors	Ongoing
Vehicles	■ Heavy equipment to be fitted with low frequency directional reversing alarms	Production Manager	Ongoing
	■ Idling trucks to be positioned in areas that minimise the potential for adverse impacts a nearby residence.	Production Manager	Daily
	■ Noise emissions during the operation of vehicles and FEL will be minimised by implementing good heavy-vehicle driver habits at all times	Production Manager	Ongoing
	■ Engine brakes fitted to on-road trucks will be banned from use on-site	Quarry Manager	Ongoing
	■ Entrance and exit roads are sealed and maintained to prevent vehicle noise from corrugations and potholes.	Quarry Manager	Ongoing
Compressors, Pumps and Ancillary Equipment	■ Engine operated equipment to be fitted with residential grade silencers.	Maintenance Manager	Complete on a risk basis
	■ Compressors, pumps and ancillary equipment to be housed within a suitable noise absorbing enclosure.	Maintenance Manager	Complete on a risk basis

Alarms & Sirens	■ Visual alarms are fitted in preference to audible alarms where appropriate. ■ Any audible alarms or sirens face away from sensitive receivers. ■ Phone speakers are switched off during noise sensitive periods.	Quarry Manager	Ongoing
Training	■ Run operator-education programs on the effects of noise and the use of quiet work practices.	Quarry Manager	As required
	■ Promote the use of good heavy-vehicle driver habits at all times	Quarry Manager	Ongoing
	■ All staff and visitors are to be made aware of the objectives and requirements of this Noise Management Plan	Quarry Manager	Ongoing
General	■ Where there are several noisy pieces of equipment, operations will be scheduled so they are used separately rather than concurrently	Quarry Manager	Ongoing
	■ Operations will occur during operating hours specified in licencing conditions only.	Quarry Manager	Complete on a risk basis
	■ Noise generating activities will be minimised on the weekends	Quarry Manager	Complete on a risk basis
Community	■ Consult regularly with sensitive receivers ■ Where possible carryout noisy activity at times that are not noise sensitive (avoid early morning or evenings). ■ Inform sensitive receivers ahead of time if atypical noise levels are expected.	Quarry Manager	Ongoing
Monitoring and Auditing	■ Conduct operational noise monitoring to determine compliance or otherwise. Address any non-compliant sources as appropriate.	Quarry Manager	As required
	Record details of any complaints, including: ■ Person making complaint and contact details ■ Time the noise was at unacceptable levels ■ Description of the noise source if possible ■ Refer to an acoustics specialist if unable to be resolved	Quarry Manager	As required
Reporting	■ Internal reporting as necessary i.e. records of complaints, noise measurements conducted, dates and results of plant and equipment inspection, correspondence. Relevant forms to be completed and filed for reference.	Quarry Manager	As required

Corrective Action	■ If corrective action for a noise source is deemed necessary, attempt the following in order: 1. Repair the item of plant if deemed to be faulty 2. Locate the activity so as to maximise shielding behind a structure or noise barrier. 3. Seek advice of an acoustic specialist if a solution is not found.	Quarry Manager	Complete on a risk basis

Appendix 8

QUARRY BLASTING PROCEDURE

This document specifies all blasting requirements for the site.

Notification Requirements

Neighbours

Where quarry activities are planned which have the potential for off-site impacts, the following procedure will apply for notifying potentially affected residents:

- Notify Don Petty by text message or phone call
- Notify Bo Waterhouse by phone when firing in the Southern Extension

Note that blasting or other works (except for maintenance) outside of Hours of Operation as set out in condition 13 of the Planning Permit cannot be undertaken without the written approval of the Responsible Authority (Cardinia Shire Council).

Government Department

- Nil

Shire

- Nil

Others

- Staff/employees/contractors notify verbally in the pre start meetings or via the scope of task, place "Blasting Today" in front of the office. Notify the radio room if the blast will affect sales.

Monitoring Requirements

Ground Vibration

- Suitably qualified blasting consultant to complete ground vibration at 4 points if firing in the Southern Area (Quarry Office, North East Corner of Site, 540 Toomuc Valley Road (The Rises) and Waterhouse Shed.)

Air blast

- Suitably qualified blasting consultant to complete air blast at 4 points if firing in the Southern Area (Quarry Office, North East Corner of Site, 540 Toomuc Valley Road (The Rises) and Waterhouse Shed.)

Videoing

- Video recording (including story board showing; date, time, site aerial photograph or drone flight grid reference, ground vibration, air blast)

Appendix 8

Clearance of persons from hazardous areas / Site Security

Persons on site

- Everyone (all site staff/employees, Drivers and Visitors) to assemble in stockpile area, workshop, office, lunchroom except shot firer and siren operator (in primary booth) or other area as determined by Quarry Manager or Shot Firer
- All road trucks to be parked in stockpile area
- Manager/sentry to check the damstra 'onsite list' to ensure that they have been located in the designated assembly area
- Barricade haul road at pugmill to prevent any vehicles travelling towards shot.

Neighbours / Others

- Manager to drive around site perimeter road to check for neighbours

Blasting Shelter

The approved blasting shelter for this site is a 50 tonne dump truck.

Blast time limitations

Blasting can only occur between 11am to 12pm and 2pm to 3pm on Weekdays (excluding public holidays)

Appendix 8

This section summarises the activities involved in conducting blasting operations at the Pakenham Quarry and lists the responsibilities and actions/decisions required by the various people involved. It lists the decisions and authorisations to be made by the Quarry Manager.

Legend

Abbrev.	Description	Abbrev.	Description
QM SF S	Quarry Manager Certified Shotfirer (may be quarry personnel or contractor) Weighbridge Operator/Siren Operator	C	Contractor: CD - Contractor – Drilling CE - Contractor – Explosives Supply CS - Contractor – TEchnical Services CV - Contractor – Vibration Monitoring
D A ✔	Decision Approval necessary Action by	L	Loading Crew (may be quarry personnel or contractor):

Activity	Action by				
	QM	SF	L	C	S
Blast Design and Layout					
• Need to blast/decide blast location.	D	D			
• Visually assess face	✔	✔			
• Prepare blast site, access and bunding, including edge protection) for drill rig		✔			
• Face profiling, hole design, hole layout.	A	✔		CS	
Drill Blast Holes					
• Holes drilled to design (record any unusual events during the drilling such as; cavities, soft rock, inability to drill holes in accordance with plan, etc)				CD	
• Front row bore tracked				CS	
• Hole profiles produced and reviewed	A	✔		CS	
• Redrill, if required		D		CD	
• Inspect face from floor and note face weaknesses, shattered ground on profiles	✔	✔			
• Check hole depths	✔	✔			
• Review Drillers log .	✔	✔			
Design Blast And Source Explosives					
• Hole loading design and review	A	✔		CS	
• Prepare hole loading chart	A	✔		CS	
• Initiation sequence design	A	✔		CS	
• Determine quantities of explosives and detonators		✔		CS	

Appendix 8

• Check availability of explosive supplier; decide time and date	D	✔		CE	
• Notify vibration monitoring contractor of shot time and monitoring locations	✔	✔		CV	
• Organise loading crew	✔	✔	✔		
• Check site access for bulk tanker	✔	✔			
• Check weather forecast.	✔	✔			
Day Of Blast - Preliminaries					
• Observe weather conditions (Blasting is not conducted in overcast and other weather conditions, which are likely to enhance propagation of air blast noise in the direction of sensitive residents/receivers)	✔	✔			
• Decide to proceed with blast	D	✔			
• Notify Don Petty on the day of blast	✔	✔			
• Place advisory signs, e.g. “Danger Charged Shot Holes”	✔	✔			
• Place stemming material near blast holes (usually day before)	✔	✔			
• Remove all unnecessary machinery from blast area	✔	✔			
• Display blasting time	✔	✔			
• Check weather forecast.	✔	✔			
Loading Explosives					
• Ensure no other quarry activities are occurring or can occur on the bench above or below the blasting activities	✔	✔			
• Bulk tanker arrives at Quarry; and weighs in at weighbridge: Contractors sign in, proceed to blast site and prepare for operation			✔	CE	
• Contractor explosive’s truck arrives at Quarry; Contractors sign in and proceed to blast site			✔	CE	
• Conduct Day of shot risk assessment with explosives crew	✔	✔		CE	
• Lay out boosters and down hole detonators (keep 1 metre apart, do not drop or throw)		✔	✔		
• Check hole depths and record		✔	✔		
• Make up primers; lower booster down hole; secure lead lines at surface		✔	✔		
• Determine hole charge from hole depth and density of product plus minimum stemming height		✔	✔		
• Commence loading and lift primer from bottom		✔	✔	CE	
• Ensure column rises – be aware of the possibility of cavities – especially in front row holes		✔	✔	CE	

Appendix 8

• Stop loading at required delivery count and stemming height (mark on hose) or top up to required stemming height – systematically load all blast holes		✔	✔	CE	
• Add stemming material allowing for any gassing time		✔	✔		
• When loading complete, the Contractors clean up the bulk tanker, weigh out and sign out			✔	CE	
• Check explosive loading log (including densities)		✔			
• Connect up surface detonators, commencing with echelon rows with control row last		✔	✔		
• Ensure loaded shot holes are constantly supervised and shot is not left unprotected at any time		✔			
• 2 qualified shot firers to walk the shot to check that all surface connections and initiation point is tied in correctly and as per design for timing	✔	✔			
Firing the Blast					
• Blast shelter in position		✔			
• Exploder and caps are taken to the shelter		✔			
• Decide time of blast		D			
• Complete evacuation process including positioning of sentries	✔				
• Advise Shotfirer when evacuation is complete and sentries have been posted	✔				
• When ready to blast, advise Quarry Manager and Plant Operator for sirens and request radio silence		✔			✔
• Three short warning sirens are sounded to indicate that a blast is imminent		✔			✔
• Connect lead in line to non electric exploder		✔			
• The blasting area is checked to ensure that the blast site is clear. After a pause of at least three minutes, two audible signals are given		✔			✔
• After a pause of at least one minute, a continuous siren is sounded, the shot fired as soon as possible after the siren has sounded for at least ten seconds. The siren will cease after the shot has been fired		✔			✔
• When the dust and fumes have cleared, the blast is inspected for signs of a misfire		✔			
• If all holes have fired, the "ALL CLEAR" is sounded by a long continuous siren of 10 seconds duration.		✔			
After The "All Clear"					

• Guards or sentries stand down and quarry operation returns to normal	✔	✔			
• Any missing edge protection bunding should be reinstated	✔				
• The floor is swept before trucks enter the loading area		✔			
• The lead in line is wound up and disposed of, the exploder are returned to the office		✔			
• Shotfirer's Report completed	A	✔			
• Video of blast is viewed	✔	✔		CV	
• Slope stability check is completed in the pit and closest land slips to blast site	v	✔			
• Vibration results are reviewed and entered in Manager's Report, pending full report	✔	✔		CV	
• Blast Vibration Report prepared and sent to Quarry.	✔	✔		CV	
Precautions When A Storm Approaches					
If an electrical storm, thunderstorm or dust storm approaches a shot during loading, the Shotfirer must:					
• If loading can be completed and the shot fired before the storm comes dangerously close then fire the shot		✔			
• If loading cannot be completed then make all circuits safe; collect and return all unloaded explosives to the contractors explosives utility; withdraw all persons to a safe distance from the blast or any explosive in the course of transportation		✔			
• Keep the blast site under observation from a safe place until the storm passes		✔			
• Where applicable, on the approach of a thunderstorm, all work in magazines must cease, the doors closed and locked, and people withdraw to a safe distance until the storm passes		✔			
• No person to return to the magazine until the shotfirer determines it is safe to do so.		✔			
Dealing With Misfires					
• Establish cause of misfire	✔	✔			
• Treat misfire as per Attachment 3.14A.	✔	✔			
Transporting Explosives Around The Quarry					
• Vehicles used to transport explosives and detonators shall comply with Attachment 3.14D "Vehicles used to transport explosives"	✔	✔			
• The driver has a licence to use explosives		✔	✔	CE	

• Explosives shall be transported in Explosive Receptacles complying with Attachment 3.14E "Explosive Receptacles".		✔	✔	CE	
Storage Of Explosives On Site					
• Storage of explosives not permitted on site	✔				

tivity Responsibilities

Legend

Abbrev.	Description	Abbrev.	Description
QM SF S	Quarry Manager Certified Shotfirer (may be quarry personnel or contractor) Weighbridge Operator/Siren Operator	C	Contractor: CD - Contractor – Drilling CE - Contractor – Explosives Supply CS - Contractor – TEchnical Services CV - Contractor – Vibration Monitoring
D A ✔	Decision Approval necessary Action by	L	Loading Crew (may be quarry personnel or contractor):

Activity	Action by				
	QM	SF	L	C	S
Blast Design and Layout					
• Need to blast/decide blast location.	D	D			
• Visually assess face	✔	✔			
• Prepare blast site, access and bunding, including edge protection) for drill rig		✔			
• Face profiling, hole design, hole layout.	A	✔		CS	
Drill Blast Holes					
• Holes drilled to design (record any unusual events during the drilling such as; cavities, soft rock, inability to drill holes in accordance with plan, etc)				CD	
• Front row bore tracked				CS	
• Hole profiles produced and reviewed	A	✔		CS	
• Redrill, if required		D		CD	
• Inspect face from floor and note face weaknesses, shattered ground on profiles	✔	✔			
• Check hole depths	✔	✔			
• Review Drillers log .	✔	✔			
Design Blast And Source Explosives					
• Hole loading design and review	A	✔		CS	
• Prepare hole loading chart	A	✔		CS	
• Initiation sequence design	A	✔		CS	
• Determine quantities of explosives and detonators		✔		CS	

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• Check availability of explosive supplier; decide time and date	D	✔		CE	
• Notify vibration monitoring contractor of shot time and monitoring locations	✔	✔		CV	
• Organise loading crew	✔	✔	✔		
• Check site access for bulk tanker	✔	✔			
• Check weather forecast.	✔	✔			
Day Of Blast - Preliminaries					
• Observe weather conditions (Blasting is not conducted in overcast and other weather conditions, which are likely to enhance propagation of air blast noise in the direction of sensitive residents/receivers)	✔	✔			
• Decide to proceed with blast	D	✔			
• Notify Don Petty on the day of blast	✔	✔			
• Place advisory signs, e.g. “Danger Charged Shot Holes”	✔	✔			
• Place stemming material near blast holes (usually day before)	✔	✔			
• Remove all unnecessary machinery from blast area	✔	✔			
• Display blasting time	✔	✔			
• Check weather forecast.	✔	✔			
Loading Explosives					
• Ensure no other quarry activities are occurring or can occur on the bench above or below the blasting activities	✔	✔			
• Bulk tanker arrives at Quarry; and weighs in at weighbridge: Contractors sign in, proceed to blast site and prepare for operation			✔	CE	
• Contractor explosive’s truck arrives at Quarry; Contractors sign in and proceed to blast site			✔	CE	
• Conduct Day of shot risk assessment with explosives crew	✔	✔		CE	
• Lay out boosters and down hole detonators (keep 1 metre apart, do not drop or throw)		✔	✔		
• Check hole depths and record		✔	✔		
• Make up primers; lower booster down hole; secure lead lines at surface		✔	✔		
• Determine hole charge from hole depth and density of product plus minimum stemming height		✔	✔		
• Commence loading and lift primer from bottom		✔	✔	CE	
• Ensure column rises – be aware of the possibility of cavities – especially in front row holes		✔	✔	CE	

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• Stop loading at required delivery count and stemming height (mark on hose) or top up to required stemming height – systematically load all blast holes		✔	✔	CE	
• Add stemming material allowing for any gassing time		✔	✔		
• When loading complete, the Contractors clean up the bulk tanker, weigh out and sign out			✔	CE	
• Check explosive loading log (including densities)		✔			
• Connect up surface detonators, commencing with echelon rows with control row last		✔	✔		
• Ensure loaded shot holes are constantly supervised and shot is not left unprotected at any time		✔			
• 2 qualified shot firers to walk the shot to check that all surface connections and initiation point is tied in correctly and as per design for timing	✔	✔			
Firing the Blast					
• Blast shelter in position		✔			
• Exploder and caps are taken to the shelter		✔			
• Decide time of blast		D			
• Complete evacuation process including positioning of sentries	✔				
• Advise Shotfirer when evacuation is complete and sentries have been posted	✔				
• When ready to blast, advise Quarry Manager and Plant Operator for sirens and request radio silence		✔			✔
• Three short warning sirens are sounded to indicate that a blast is imminent		✔			✔
• Connect lead in line to non electric exploder		✔			
• The blasting area is checked to ensure that the blast site is clear. After a pause of at least three minutes, two audible signals are given		✔			✔
• After a pause of at least one minute, a continuous siren is sounded, the shot fired as soon as possible after the siren has sounded for at least ten seconds. The siren will cease after the shot has been fired		✔			✔
• When the dust and fumes have cleared, the blast is inspected for signs of a misfire		✔			
• If all holes have fired, the "ALL CLEAR" is sounded by a long continuous siren of 10 seconds duration.		✔			
After The "All Clear"					

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• Guards or sentries stand down and quarry operation returns to normal	✔	✔			
• Any missing edge protection bunding should be reinstated	✔				
• The floor is swept before trucks enter the loading area		✔			
• The lead in line is wound up and disposed of, the exploder are returned to the office		✔			
• Shotfirer's Report completed	A	✔			
• Video of blast is viewed	✔	✔		CV	
• Slope stability check is completed in the pit and closest land slips to blast site	v	✔			
• Vibration results are reviewed and entered in Manager's Report, pending full report	✔	✔		CV	
• Blast Vibration Report prepared and sent to Quarry.	✔	✔		CV	
Precautions When A Storm Approaches					
If an electrical storm, thunderstorm or dust storm approaches a shot during loading, the Shotfirer must:					
• If loading can be completed and the shot fired before the storm comes dangerously close then fire the shot		✔			
• If loading cannot be completed then make all circuits safe; collect and return all unloaded explosives to the contractors explosives utility; withdraw all persons to a safe distance from the blast or any explosive in the course of transportation		✔			
• Keep the blast site under observation from a safe place until the storm passes		✔			
• Where applicable, on the approach of a thunderstorm, all work in magazines must cease, the doors closed and locked, and people withdraw to a safe distance until the storm passes		✔			
• No person to return to the magazine until the shotfirer determines it is safe to do so.		✔			
Dealing With Misfires					
• Establish cause of misfire	✔	✔			
• Treat misfire as per Attachment 3.14A.	✔	✔			
Transporting Explosives Around The Quarry					
• Vehicles used to transport explosives and detonators shall comply with Attachment 3.14D "Vehicles used to transport explosives"	✔	✔			
• The driver has a licence to use explosives		✔	✔	CE	

• Explosives shall be transported in Explosive Receptacles complying with Attachment 3.14E "Explosive Receptacles".		✔	✔	CE	
Storage Of Explosives On Site					
• Storage of explosives not permitted on site	✔				

Appendix 9

NET GAIN OFFSET MANAGEMENT PLAN

BIOSIS RESEARCH

Net Gain Offset Management Plan for the Readymix Mt. Shamrock Quarry, Pakenham

13 September 2007

BIOSIS RESEARCH

Plan prepared for
Readymix

Net Gain Offset Management Plan for the Readymix Mt. Shamrock Quarry, Pakenham

September 2007

FINAL REPORT

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- Stephen Jenkins

Biosis Research Pty Ltd
- Maria Pham (mapping)

ABBREVIATIONS

DSE	Department of Sustainability & Environment, Victoria
DPI	Department of Primary Industry, Victoria
EPBC	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EVC	Ecological vegetation class
FFG	*Flora and Fauna Guarantee Act 1988* (Vic.)
FIS	Flora Information System (DSE)

CONTENTS

1.0 INTRODUCTION

1.1 Background

This offset management plan has been prepared in order to achieve a net gain offset for the habitat hectares lost and large old trees removed for the expansion of the Readymix Mt. Shamrock Quarry, Pakenham (Figure 1). It satisfies the requirements of Planning Permit # T050156. This plan refers to specific planning permit conditions, which are detailed in this document.

An assessment of the flora and fauna values associated with the approved expansion of the quarry is contained in Biosis Research (2005).

Readymix will coordinate the conservation management of the offset area for the ten year duration of this plan. However beyond that the offset site could fall under different ownership. In this case, any gains achieved by the revegetation and management of the offset site will be of an ongoing and secure nature. Readymix will be financially responsible for the ten year management program and affiliated activities.

1.1.1 Native Vegetation Management Framework

The Native Vegetation Management Framework (NRE 2002) is State Government policy for the protection, enhancement and revegetation of native vegetation in Victoria. The Framework is an incorporated document in all planning schemes in Victoria. The primary goal of the Framework is:

> *a reversal, across the whole landscape, of the long-term decline in the extent and quality of native vegetation, leading to a Net Gain* (NRE 2002).

In association with the regional Native Vegetation Plans, the Framework provides decision-making tools for native vegetation management.

Where an application is made to remove native vegetation, a proponent for a development must explain the three steps that have been taken to:

- Avoid adverse impacts, particularly through vegetation clearance.
- Minimise impacts if impacts cannot be avoided.
- Identify appropriate offset options.

A proponent for a development must demonstrate that the option to avoid and minimise vegetation clearance has been explored before considering offsets.

An offset may be achieved by improvements in the quality or extent of native vegetation in a selected 'offset area', either within a project area or off-site. An area that is revegetated and protected or set aside for natural regeneration may provide some, or all, of the required offset. The conservation significance of vegetation to be removed is also taken into account when offsets are determined.

1.1.2 Port Phillip and Westernport Native Vegetation Plan

This document (Port Philip and Westernport Catchment Management Authority 2006) has been prepared to develop a strategic and co-ordinated approach to the management of native vegetation within the region. The plan is designed to complement the Native Vegetation Management Framework and contains specific information and objectives relating to the region.

The plan has four strategic directions:

- Retain the quantity of native vegetation by minimising clearing.
- Protect native vegetation with reservation and management agreements.
- Maintain and improve the quality of native vegetation.
- Increase the quantity of native vegetation.

Responses and offset options for applications to clear native vegetation are outlined in Appendix 3.4 of the native vegetation plan (page 52). Offsets for unavoidable and permitted tree losses are calculated using this plan.

The objectives of the Native Vegetation Plan are similar to those of the Native Vegetation Management Framework and both sets of objectives can be met through the three step approach to achieving net gain.

Offsets for unavoidable tree losses are calculated using the Port Phillip and Westernport Native Vegetation Plan (PPWCMA 2006).

Implications for the proposal

Meeting the net gain vegetation policy objectives is a requirement of the planning agencies (Council and DSE) and is a condition of the planning permit (T050156).

1.2 Objective

This management plan addresses the third step of the net gain three-step approach – offsetting the loss of native vegetation. The objective is to achieve a net gain offset for native vegetation and large old trees removed during the expansion of the Mt. Shamrock Quarry in accordance with the planning permit.

Implementation of this vegetation management plan is the responsibility of Readymix.

The planning permit contains the following conditions:

Planning Permit Section 8
The landscape plan required in accordance with condition 5 of this permit must be drawn by a suitably qualified landscape architect or designer and must be generally in accordance with plans included in the endorsed Work Plan and marked as drawing numbers L1a (January 2005), L2a (November 2004), L3a (November 2004) and L4a (November 2004), but modified to show:

(d) full details of Net Gain requirements including the Net Gain offset area of no less than 1.71 hectares, to the satisfaction of the Regional Director, Port Phillip Region, Department of Sustainability and Environment (DSE); and

(e) plantings associated with surface water quality, including;

- Reinstatement of riparian vegetation along the waterway downstream of Donazzan's Dam to provide additional protection and improvement to the aquatic ecosystem.

Planning Permit Section 39
The EMP must include but not be limited to the following matters:

(a) rehabilitation and vegetation;

(b) Native Vegetation Offset Plan (that must be to the satisfaction of the Department of Sustainability and Environment);

Planning Permit Section 44
Before the commencement of Extractive industry works in the extension area, the permit holder must enter into an agreement with the Responsible Authority under Section 173 of the Planning and Environment Act 1987 *(the Act) that must provide for:*

(b) Maintenance and permanent protection of Net Gain offset areas identified in the Native Vegetation Offset Plan required under condition 40(k) of this permit.

The offset management plan will commence within six months of approval, assuming all other project approvals to facilitate site preparation are in place. The Department of Sustainability and Environment expects the offset management plan to commence within one year of the start of the vegetation clearance. The offset is to be actively and appropriately managed for ten years to ensure long-term viability.

1.3 Prescribed Offsets

The following offsets were defined for the expansion of the Mt. Shamrock quarry (Biosis Research 2005):

- 0.24 habitat hectares provided by 1.71 hectares of revegetation;
- Protection of 38 Large Old Trees (LOTs) and 20 Medium Old Trees (MOTs); and
- Recruitment of 290 Trees.

All the prescribed offsets are provided in the context of the exemptions provided within the Framework to mining and quarry industries (NRE 2002:page 24). In that context offsets are provided within the like-for-like guidelines for losses of Low conservation significance. As such the revegetation works can be for any EVC within the bioregion, must provide a similar or more effective land protection function and any habitat hectare losses may be completely offset by revegetation works.

1.4 Nominated Offset Site

The areas identified to provide the prescribed net gain offsets are outlined in Figure 2. These areas are all within existing property owned by Readymix contiguous with the Mount Shamrock quarry. The offset areas include an existing fenced area protecting the riparian vegetation below Donazzan's Dam and a parcel of land encompassing the stand of remnant indigenous trees about 400 metres to the north north east of this creek line and about 100 metres east of the existing house on this land.

The section of the offset site associated with the riparian vegetation below Donazzan's Dam is divided into two sections by an existing stock crossing and covers an area of about **1.8 ha**. This area supports 16 LOTs and 8 MOTs including:

- two large old Green Scentbark *Eucalyptus fulgens*
- two large and two medium old Manna Gum *Eucalyptus viminalis*
- one large and six medium old Messmate *Eucalyptus obliqua*
- 11 large old Swamp Gum *Eucalyptus ovata*

The large section of the offset site is to the north east of the driveway to this property and east of the existing house. It covers an area of **6.9 ha** and includes:

- two large old Mountain Grey Gum *Eucalyptus cypellocarpa*
- four large old Manna Gum *Eucalyptus viminalis*
- 16 large and 20 medium old Swamp Gum *Eucalyptus ovata*
- two large old Narrow-leaf Peppermint *Eucalyptus radiata*
- three large old Messmate *Eucalyptus obliqua*

About two hectares of this site is required to provide for the protection of the LOTs present (an area with twice the canopy diameter of the tree fenced and protected from adverse impacts to ensure natural regeneration or planting can occur). The site also supports over 1.71 ha of cleared pasture available for revegetation and a further two hectares of pasture to provide space for the natural recruitment of trees.

DSE (2006: Section 3.1) prescribes an area of one hectare for the establishment of 150 trees within a lowland/foothill forest environment. Therefore the prescribed recruitment of 290 trees through the stimulation of natural regeneration from existing trees requires an area of about two hectares to provide the prescribed offset. This area is available within the northern offset block.

Offset Summary

The prescribed offsets for Large Old Tree protection, revegetation and recruitment are all provided for within the defined offset sites within the Readymix property, adjacent to the eastern boundary of the Mt. Shamrock quarry.

2.0 MANAGEMENT ISSUES

Management for the natural values of the offset site aims to improve the condition of vegetation by allowing the natural recruitment of trees and the regeneration/revegetation of indigenous understorey species to replace the existing dominance of exotic species.

The vegetation throughout the offset site has been altered significantly from its original condition and is now dominated by introduced pasture and weed species beneath the remnant trees. A long history of grazing by domestic stock, and in more recent times, the invasion of noxious, environmental weeds (plants that invade and displace indigenous flora and fauna) throughout the study site has dramatically altered the floristic composition of the site.

The key management issues to improve the condition of indigenous vegetation within the offset site are:

- tree protection;
- retention of logs and organic litter;
- natural recruitment and enrichment planting;
- woody and grassy weed control;
- biomass control;
- pest control;
- access;
- signage;
- fire safety management; and
- long-term protection.

Qualified contractors with experience in the rehabilitation of indigenous vegetation should undertake bushland regeneration works. Audits will be necessary to review the success of the works program, and ensure appropriate forward planning.

Management issues are discussed below, and should be read in conjunction with the management activities outlined in Appendix 1. Suggestions are made as to how some of the management issues should be addressed, but techniques could be adapted or alternative techniques employed by the bushland management contractor according to experience and results from ongoing monitoring of the offset site.

2.1 Tree protection

All existing canopy trees are to be protected. This requires a minimum area of twice the canopy diameter to be protected from adverse impacts (DSE 2007). Management of the site should allow enough space surrounding each tree for fallen limbs and to allow future recruitment to eventually replace the old tree.

Tree canopy health should be monitored to ensure it is sustained. Mechanisms for maintaining tree health, may be required if tree health declines.

2.2 Logs and organic litter

Fallen trees and branches must be retained as coarse woody debris is an important habitat feature of natural forest systems.

Current levels of fallen timber within the offset site are low and there is an opportunity to strategically place additional logs within the site. Logs created from permitted removal of trees within the quarry extraction limit should be retained and placed within the offset site to enhance its habitat value. Logs should be trimmed to the maximum practical length and placed in such a way that management activities (e.g. slashing) are not impeded.

All fallen logs, branches and leaf litter should be retained in situ.

2.3 Recruitment and enrichment planting

Past management of the site has resulted in a loss of habitat features such as an indigenous ground-cover, eucalypt saplings, mid-storey shrubs, and woody debris. The lack of these features reduces its attractiveness for many woodland fauna species. Management for recruitment and revegetation of indigenous vegetation can restore these features, and in turn, encourage indigenous fauna to utilise the area.

To meet the recruitment requirement, it should be emphasised that natural recruitment is preferable to planting in order to maintain the ecological integrity of the site. Apart from the presence of scattered remnant trees, this offset site supports few natural remnants of the natural vegetation of this site. Therefore while natural tree recruitment is possible, planting is required to establish most other species indigenous to this site.

2.3.1 Natural Recruitment

Eucalypts generally recruit well in the absence of grazing. Therefore once grazing has been removed the occurrence of tree recruitment should be

monitored. A dense cover of exotic pasture grasses has the potential to inhibit tree recruitment and some level of pasture control may be required. Options include boom spraying bands of pasture to generate strategically placed areas of bare ground. Once the seedlings have been able to establish, they may need to be protected to avoid being destroyed by other management activities (i.e. weed control works, patch burning, slashing).

It should be noted that due to the often prolific nature of eucalypt recruitment, not all of the recruits will be retained. There is a natural process of thinning that would occur if left over time. Once the recruiting eucalypts reach a height of approximately two metres (this will take up to five years), this process of thinning may be accelerated by the bushland regenerator to remove the less viable trees and improve the survival of the remaining, healthier recruits. Prolific recruitment around very old eucalypts may also affect their health due to stress from competition. If this is observed then seedlings around such trees should be more heavily thinned.

The following information is provided as a guide for managing land for natural regeneration:

- Areas proposed for regeneration/revegetation should be prepared by undertaking biomass control (see section 2.5) and recruitment may also be enhanced by 'scratching' the soil surface prior to seed dispersal.
- Where the distance from a mature tree canopy is greater than about 20 m, seed should be collected and scattered over the site. Seed can be collected from any remnant indigenous eucalypt in the local area.
- Under this new management regime, it is possible that additional native species with dormant seeds will begin to regenerate. However natural recruitment in this agricultural environment is expected to be limited and enhancement planting should occur after an initial period of site preparation.
- Additional species propagated from locally collected seed will be planted throughout the offset site, in accordance with the densities indicated in the Lowland Forest benchmark (Appendix 2).
- No infrastructure should be erected under the trees.
- As mentioned previously, some thinning of young eucalypts may be required.

2.3.2 Understorey enhancement

The understorey vegetation over virtually all of the offset sites is dominated by a suite of introduced grasses and Blackberry *Rubus fruticosus* spp. agg. and as a result is in poor condition. The removal of these weeds needs to be undertaken in conjunction with the re-establishment of the indigenous understorey species including species from all the life forms identified by the relevant EVC benchmark.

Enhancement planting for the northern section of the offset site should be based on the Lowland Forest (EVC 16) benchmark while the northern area was predominantly Swampy Riparian Woodland (EVC 83), although more elevated areas should use the Lowland Forest Benchmark. These benchmarks are provided in Appendix 2.

The re-establishment of this indigenous understorey requires a reduction in competition from introduced grasses, followed by the introduction of indigenous seed. A bush regenerator with experience in re-establishing indigenous species could provide advice on the most up-to-date best practice techniques for re-establishing indigenous vegetation. **It is important that a contactor with expertise in revegetating the local indigenous vegetation community be appointed.** The contractor should provide further detail on the methods to be used in a detailed works program, to be approved by the land manager prior to commencement of works. This would involve specific site preparation works followed by direct seeding, hand dispersal of seed or planting of nursery grown tube stock.

All species selected should be of local provenance and suitable for the relevant EVC (suggestions in Appendix 3).

Where feasible weed control should be carried out using non-herbicide dependant methods such as slashing, mulching and hand removal. Often, a combination of herbicide and non-herbicide based methods is most appropriate. Where it is necessary to utilise herbicides ensure that chemicals are appropriate for use in areas adjacent to waterways. Also consider that some chemicals are residual, and may contaminate waterways and affect regeneration or revegetation efforts.

2.3.3 Minimum Revegetation Standards

The DSE revegetation standards (DSE 2006) require minimum densities for different life forms when establishing native vegetation for net gain accounting. The minimum requirements for each life form are presented in Table 1.

2.4 Woody weed control

There are a small number of high threat woody weeds located within the offset site including Briar Rose *Rosa rubiginosa*, Hawthorn *Crateagus monogyna* and Blackberry. These species should be controlled / removed in the first year of management. Ongoing monitoring and control of any seedlings will be required, as these species are widely dispersed by birds and are likely to recolonise the site. Refer to Appendix 4 for descriptions and control guidelines of these key woody weeds.

Table 1: Minimum 10 year revegetation survival targets per hectare.

EVC Life Form	Lowland Forest	Swampy Riparian Woodland
Understorey Tree /Large Shrub	100	250
Medium Shrub	1200	800
Small Shrub	500	100
Large tufted Graminoid	500	1500
Total No. of Plants per Hectare	**2300**	**2650**

The weed management program needs to also account for the potential introduction of new weeds, or changes in population sizes of existing weeds that may change their priority for control.

2.5 Biomass control

In the absence of grazing by domestic stock the biomass of pasture grasses and associated environmental weeds may accumulate to form a dense ground cover. This accumulation would inhibit the proposed revegetation works and also provides a significant fire hazard.

The easiest and most economic way to control the biomass levels surrounding the trees is to slash/mow. However with the broad-scale revegetation works proposed, the regeneration of trees and shrubs is likely to make slashing impractical. In that context it is important to reduce or eliminate species likely to cause significant problems for biomass accumulation such as Toowoomba Canary-grass *Phalaris aquatica* during the site preparation phase of the revegetation program.

Fire is not an appropriate biomass management tool in vegetation supporting a high density of shrubs although in this environment the small scale use of fire to remove areas dominated by rank exotic grasses could be possible and efficient, especially if burning at times of low fire danger. Otherwise where the accumulation of biomass retards revegetation objectives these areas could be brush cut and mulched.

2.6 Pest control

Control of rabbits and foxes should be compatible with the surrounding land use. The site should be fenced with a rabbit-proof fence and monitored to determine

the extent of the populations. A strategy for vermin control should then be developed, and may include fumigation, hand destruction of burrows, and/or baiting. Ongoing monitoring will be required to ascertain the success of these techniques and to recommend any additional measures.

Control of rabbits should be undertaken in accord with *Victorian Pest Management: A Framework for Action – Rabbit Management Strategy* (NRE 2002).

2.7 Access

A secure and permanent perimeter fence should be erected to exclude stock and restrict public and vehicular access to the site. This fence will be rabbit-proof to facilitate the control of this exotic browser which provides a significant threat to revegetation objectives.

Access should be limited to management activities only, although limited interpretive access may be permitted if Readymix wish to utilise the site for education purposes.

2.8 Signage

If public access is permitted, interpretive signage will be installed in the offset site. The information boards will be designed to inform the public of the ecological values of the offset site, including descriptions of the vegetation/habitats, and pictures of some of the common flora and fauna within the reserve. They will also include information on ways the public can help to retain the values of the reserve, such as:

- staying on the access track;
- not littering;
- not dumping garden waste into the reserve;
- not letting dogs off lead;
- recommended indigenous plants for landscaping in the area;
- common garden plants which are environmental weeds; and
- not removing branches and logs for firewood.

Signs should be low enough for children to read, and could allow the information to be changed/updated either with the seasons or as the offset site improves over time.

2.9 Rubbish removal

Windblown litter and or dumped rubbish may be an issue. Litter should be periodically removed, as it will smother ground level vegetation. Dumped garden rubbish is a potential source of new weeds and must be removed immediately.

2.10 Fire safety management

As the offset site is to be managed for conservation, there will be an accumulation of leaf litter and woody debris over time. It is not planned to undertake fuel reduction activities within the offset site during the initial 10 years of this plan.

The site is surrounded by pasture and readily accessible for fire control if required. Vehicle access gates will be provided in the boundary fence at selected locations.

Readymix undertakes to negotiate any fire safety management requirements with the Country Fire Authority (CFA) and incorporate any requirements into the Net Gain Offset Management Plan.

2.11 Long-term protection

Readymix is responsible for the management of this site for the next ten years. Subject to mutual agreement, formal arrangements may be made within this period to delegate responsibility and funding to undertake management to the a third party. Permanent protection of the trees and designated offset areas will be ensured through a legal agreement, to be negotiated with Council.

2.12 Planning, monitoring and audit

Once a contractor is appointed to deliver the works program, the bushland management contractor and an ecologist should conduct an initial site inspection together to discuss specific management issues and requirements for the site. The bushland management contractor should then prepare and implement an annual works program, including achievable management objectives consistent with this management plan.

Ongoing monitoring of the reserve will be required to ensure that the required gains (in terms of tree recruitment and revegetation) are achieved. This could be undertaken by the bushland regenerator on an annual basis as part of the ongoing management of the reserve.

Audit by an independent ecologist is also recommended following years 1, 2, 3, 5 and 7. The reserve should be inspected by a qualified ecologist after 10 years of management to document the achievement of Net Gain offsets, and the results of this inspection should be reported to DSE.

3.0 MANAGEMENT PROGRAM

Implementation of this management plan/program is the responsibility of Readymix.

The offset site manager is responsible for:

1. Site definition and protection;
2. Organising plant propagation and/or plant purchasing;
3. Site preparation;
4. Planting/stimulating tree recruitment;
5. Maintenance of plantings/revegetation for 10 years;
6. Organising independent audit/monitoring procedures (years 1, 2, 5, 7 & 10);
7. Implementation of any further management actions identified by audit; and
8. Reporting to responsible authority (forwarding of audits).

All management works are to be undertaken only by qualified and experienced horticulturalist / landscape contractors.

This offset management plan is current to January 2018, unless it is superseded by another plan.

Site identification and protection

1. Establish an approved 173 Agreement under the *Planning and Environment Act 1987*.
2. The offset site will be fenced in order to clearly delineate the site's extent. Fencing will be of a standard rabbit-proof farm fence.
3. Install an appropriate sign to inform residents/visitors of the site's ecological characteristics, purpose and value.

Plant propagation

4. Propagate plants or collect seed for dispersal for species listed per Appendix 3. These species are selected because they are components of Lowland Forest or Swampy Riparian Woodland and/or are locally indigenous species that are suitable for the offset site. Local provenance (material collected within 20 km) is essential. Non-local provenance is not to be used, and any inadvertent plantings are to be removed. Species substitution within life forms is acceptable if species are not available.

   It is recommended that the plants/seed be ordered from an indigenous nursery 6 to 12 months in advance as they are not all likely to be in stock and most may need to be propagated from seed or cuttings specifically for this project. Since local provenance is required, failure to plan ahead may result in long delays in meeting the planning permit conditions.

Site preparation

5. Prepare the site over a minimum six month period through:
   (a) monthly sprays of existing (introduced) vegetation to deplete the weed soil seed bank;
   (b) cut and paint and/or drill and fill weedy shrubs such as Hawthorn, Briar Rose and Blackberry;
   (c) installation of a shallow layer of mulch (less than 5 cm deep) to prevent soil loss but not inhibit the germination of weeds; and

Planting

6. Plant / recruit appropriate species as per Appendix 3 within the offset site (Figure 2). Planting / recruitment densities need to comply with the minimum revegetation standards provided by DSE (DSE 2006).

Maintenance of plantings for 10 years

7. Maintain the plantings taking all necessary measures to ensure (a) survival and growth of the plants, and (b) good appearance or presentation of the plantings. Supplementary watering may be required during exceptionally dry periods. Plantings that do not survive are to be replaced. Substitution of species within life forms is acceptable for replacement purposes.
8. Undertake complete weed control on a monthly basis during the primary weed season (June to December inclusive) and at other times as required. All weeds are to be controlled using appropriate and efficient techniques that do not damage the plantings. Manual control is an important technique, as plantings are frequently killed by herbicide spray drift.

Offset management audit/monitoring

9. Undertake a management audit/monitoring exercise at 1, 2, 5, 7 and 10 years after planting to evaluate performance and thus compliance with the planning permit. Photo points will be set up and offset progress will be shown in audit reports.

   Implementation and monitoring of the offset site is to be conducted by a qualified ecologist, engaged by Readymix. Their responsibilities include:
   (a) Ensuring offset site management contractors are suitably qualified;
   (b) Approving plant selection and supply;
   (c) Approving works plan;
   (d) Monitoring adherence to this plan such as site management, and recommending alternative actions where appropriate; and
   (e) Completion of audit/monitoring reports for submission to Readymix.

Implementation of further management actions as identified by audit

10. Implement any further management actions as identified by the audit. The offset site manager should have a flexible adaptive approach to vegetation management and will undertake actions identified in the audits. Additional management actions that may be engaged to protect the offset site include ecological burning for biomass reduction, hand weeding between plantings, supplementary watering and targeted weed spraying.

Reporting to responsible authority

11. Readymix will forward all audit reports (sequentially) to the Cardinia Shire Council.

REFERENCES

Biosis Research 2005. *Proposed Extension of the Readymix Mt. Shamrock Quarry, Pakenham: Vegetation and Habitat Assessment (Ecology).* Report prepared by S. Mueck, S. Koehler, T. Wills and C. Meredith of Biosis Research for Readymix.

DSE 2006. *Native Vegetation. Revegetation Planting Standards – Guidelines for establishing native vegetation for net gain accounting.* Department of Sustainability and Environment, Melbourne.

DSE 2007. *Native Vegetation: Guidelines for assessment of referred planning permit applications.* Department of Sustainability and Environment, Melbourne.

NRE 2002. *Victoria's Native Vegetation Management: A Framework for Action.* Department of Natural Resources & Environment, Victoria.

PPWCMA 2006. *Port Phillip and Westernport Native Vegetation Plan.* Port Phillip and Westernport Catchment Management Authority.

APPENDICES

APPENDIX 1
MANAGEMENT ACTIVITIES

Management – Years 1-2

Organise year's team

12. Allocate staff time and appoint contractors (program ecologist, specialist bushland contractor) as appropriate for delivery of the program over the following year.

Annual management objectives

13. The bushland management contractor and the ecologist should conduct an initial site inspection together and discuss specific management issues and requirements for the site. The bushland management contractor should then prepare and implement an annual works program, including achievable management objectives consistent with this management plan.

    Management objectives are to be specific, with emphasis on the primary season for weed control (June to January).

Access

14. Control access to the Offset Site by fencing the boundary, providing adequate access for management activities through the strategic location of gates.

15. Engage appropriate personnel (eg. ecologist, graphic designer and landscape architect) to design and install information boards, as per Section 2.8 of this management plan.

Tree protection, logs and organic litter

16. All existing canopy trees are to be protected and tree canopy health should be monitored to ensure it is sustained.

17. Fallen logs and organic litter should be retained. Fallen logs may require shifting and/or trimming to ensure ease of slashing grasses where required.

Recruitment and enrichment planting

18. Facilitate recruitment of juvenile eucalypts as described in this plan.

19. Any regenerating indigenous plants should be protected during weed removal or slashing.

20. Investigate and initiate appropriate methods for revegetation of ground flora.

Weed control

21. Remove woody weeds from the offset site. Techniques and timing of control are species dependent, and include manual removal and the use of herbicides.

    Key woody weeds targeted in year one are: Sweet Briar, Hawthorn and Blackberry.

    Stage 1 – Removal of all woody weeds, including appropriate disposal of plants.
    Stage 2 – Spot spray regrowth and seedlings.

    Wherever feasible, weed control should be carried out utilising non-herbicide methods. Consider that some chemicals are residual, and may contaminate waterways and affect regeneration or revegetation efforts.

22. Undertake control of pasture grasses in conjunction with revegetation of ground flora.

    Key weed grasses are: Soft Brome, Perennial Rye-grass, Sweet Vernal-grass, and Toowoomba Canary-grass.

Pest control

23. Monitoring of rabbit and fox populations to advise required management.

Rubbish

24. On-going removal of litter from within the reserve.

Long-term protection

25. Initiate process for legal agreement to provide permanent protection of the reserve, in negotiation with Council.

Management – Years 3-10

Organise year's team

1. Allocate staff time and appoint or re-engage contractors (program ecologist, bushland manager) as appropriate for delivery of the program over the following year.

*Ecological management review / audit**

**Auditing is suggested following years 1, 2, 3, 5, 7 and 10 as a minimum.*

2. Review the results of the current year's management actions in relation to the annual management objectives.

   This requires site inspection by a qualified and experienced ecologist independent of the bushland management contractor. A report from the bushland management contractor is also required. Both reports shall be submitted to the land manager for review.

Annual management objectives

**Providing the specialist bushland management contractor has been re-engaged from the previous year, this step may only be required following years 1,2,3,5 and 7.*

3. The bushland management contractor should prepare and implement an annual works program based on the ecologist's management review, including achievable management objectives consistent with this management plan. This program shall be approved by the Responsible Authority.

   Management objectives are to be specific, with emphasis on the primary weed season (June to January).

Weed control

**This will be required for the first five years, and possibly additional years, depending on the success of the weeding, spraying, planting and natural recruitment.*

4. Continue to control recruitment of woody weeds within the offset site. This requires weed control using appropriate techniques with negligible off-target damage, and replacement with indigenous species.

   Key woody weeds targeted in years three to five are: Sweet Briar, Blackberry and Hawthorn.

5. Maintain herbaceous/grassy weed cover at low levels. This requires weed control using appropriate techniques with limited off-target damage.

   Key weed grasses are: Soft Brome, Perennial Rye-grass, Sweet Vernal-grass, and Toowoomba Canary-grass.

Recruitment and enrichment planting

6. Any regenerating indigenous plants should be protected during weed removal.

7. Thin eucalypt seedlings after 3-5 years, if necessary.

8. Review natural recruitment throughout the reserve after 2-3 years and consider supplementary planting where appropriate (refer to recommended planting list in Appendix 3).

Tree protection, logs and organic litter

9. All existing canopy trees are to be protected, and tree canopy health should be monitored to ensure it is sustained.

10. Fallen logs and organic litter should be retained. Fallen logs may require shifting and/or trimming to ensure ease of slashing grasses.

Pest control

11. If required, control and aim to eliminate rabbits within the offset site through fumigation and hand destruction of burrows.

12. Monitor for foxes and instigate control measures if required.

Public use of site

13. Update information boards as necessary to reflect ongoing management of the site.

14. On-going removal of litter from within the reserve.

APPENDIX 2

EVC BENCHMARKS

Department of Sustainability and Environment

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Gippsland Plain bioregion

EVC 16: Lowland Forest

Description:
Eucalypt forest to 20 m tall on relatively fertile, moderately well-drained soils in areas of relatively high rainfall. Characterised by the diversity of life forms and species in the understorey including a range of shrubs, grasses and herbs.

Large trees:

Species	DBH(cm)	#/ha
Eucalyptus spp.	70 cm	20 / ha

Tree Canopy Cover:

%cover	Character Species	Common Name
30%	*Eucalyptus obliqua*	Messmate Stringybark
	Eucalyptus radiata s.l.	Narrow-leaf Peppermint
	Eucalyptus consideniana	Yertchuk

Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	2	10%	T
Medium Shrub	7	30%	MS
Small Shrub	5	10%	SS
Prostrate Shrub	2	5%	PS
Large Herb	1	1%	LH
Medium Herb	7	10%	MH
Small or Prostrate Herb	7	5%	SH
Large Tufted Graminoid	2	15%	LTG
Large Non-tufted Graminoid	1	5%	LNG
Medium to Small Tufted Graminoid	7	15%	MTG
Medium to Tiny Non-tufted Graminoid	1	1%	MNG
Ground Fern	2	15%	GF
Scrambler or Climber	3	1%	SC
Bryophytes/Lichens	na	10%	BL

LF Code	Species typical of at least part of EVC range	Common Name
T	*Acacia melanoxylon*	Blackwood
MS	*Epacris impressa*	Common Heath
MS	*Leptospermum continentale*	Prickly Tea-tree
MS	*Banksia marginata*	Silver Banksia
MS	*Leptospermum myrsinoides*	Heath Tea-tree
SS	*Amperea xiphoclada var. xiphoclada*	Broom Spurge
PS	*Acrotriche serrulata*	Honey-pots
MH	*Gonocarpus tetragynus*	Common Raspwort
MH	*Drosera peltata ssp. auriculata*	Tall Sundew
MH	*Viola hederacea sensu Willis (1972)*	Ivy-leaf Violet
SH	*Opercularia varia*	Variable Stinkweed
LTG	*Xanthorrhoea minor ssp. lutea*	Small Grass-tree
LTG	*Lomandra longifolia*	Spiny-headed Mat-rush
LNG	*Gahnia radula*	Thatch Saw-sedge
MTG	*Lomandra filiformis*	Wattle Mat-rush
MTG	*Poa australis spp. agg.*	Tussock Grass
MNG	*Microlaena stipoides var. stipoides*	Weeping Grass
GF	*Pteridium esculentum*	Austral Bracken
SC	*Billardiera scandens*	Common Apple-berry

Recruitment:
Continuous

Organic Litter:
40 % cover

Logs:
20 m/0.1 ha.

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
MH	*Hypochoeris radicata*	Cat's Ear	high	low

Published by the Victorian Government Department of Sustainability and Environment April 2004

Recruitment:
Continuous

Organic Litter:
20 % cover

Logs:
20 m/0.1 ha.

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	*Cirsium vulgare*	Spear Thistle	high	high
LH	*Sonchus oleraceus*	Common Sow-thistle	high	low
MH	*Hypochoeris radicata*	Cat's Ear	high	low
MH	*Prunella vulgaris*	Self-heal	high	high
LNG	*Holcus lanatus*	Yorkshire Fog	high	high
MTG	*Anthoxanthum odoratum*	Sweet Vernal-grass	high	high
MTG	*Briza maxima*	Large Quaking-grass	high	low

Published by the Victorian Government Department of Sustainability and Environment April 2004

APPENDIX 3

FLORA PLANTING LIST

Table A3.1: Lowland Forest planting list for Net Gain offset sites: Readymix Mt. Shamrock Quarry

Life form	Species	Common name
T	*Acacia mearnsii*	Black Wattle
T	*Allocasuarina littoralis*	Black Sheoak
T	*Eucalyptus fulgens*	Green Scentbark
T	*Eucalyptus obliqua*	Messmate Stringybark
T	*Eucalyptus radiata* ssp. *radiata*	Narrow-leaf Peppermint
T	*Eucalyptus viminalis*	Manna Gum
MS	*Acacia stricta*	Hop Wattle
MS	*Acacia verticillata*	Prickly Moses
MS	*Banksia marginata*	Silver Banksia
MS	*Bursaria spinosa*	Sweet Bursaria
MS	*Coprosma quadrifida*	Prickly Currant-bush
MS	*Epacris impressa*	Common Heath
MS	*Leptospermum continentale*	Prickly Tea-tree
MS	*Ozothamnus ferrugineus*	Tree Everlasting
LNG	*Gahnia radula*	Thatch Saw-sedge
LTG	*Austrostipa rudis*	Veined Spear-grass
MH	*Acaena novae-zelandiae*	Bidgee-widgee
MH	*Gonocarpus tetragynus*	Common Raspwort
MNG	*Dianella revoluta*	Black-anther Flax-lily
MNG	*Microlaena stipoides*	Weeping Grass
MTG	*Austrodanthonia caespitosa*	Common Wallaby-grass
MTG	*Austrodanthonia fulva*	Copper-awned Wallaby-grass
MTG	*Austrodanthonia racemosa*	Stiped Wallaby-grass
MTG	*Austrodanthonia setacea*	Bristly Wallaby-grass
MTG	*Lomandra filiformis*	Wattle Mat-rush
MTG	*Lomandra longifolia*	Spiny-headed Mat-rush
MTG	*Poa morrisii*	Soft Tussock-grass
MTG	*Themeda triandra*	Kangaroo Grass
PS	*Acrotriche serrulata*	Honey-pots
SC	*Billardiera scandens*	Common Apple-berry
SC	*Rubus parvifolius*	Small-leaf Bramble
SH	*Geranium* sp. 2	Variable Cranesbill
SH	*Veronica gracilis*	Slender Speedwell
SH	*Wahlenbergia gracilis*	Sprawling Bluebell

Notes:
(1) Local (within 20km) provenance is essential, non local provenance to be removed if planted.
(2) Species substitution within life forms is acceptable if species are not available.

Lifeforms:

T	tree	MTG	medium tufted graminoid
MS	medium shrub	MNG	medium non-tufted graminoid
LTG	large tufted graminoid	LH	large herb
MH	medium herb	PS	Prostrate Shrub
LNG	large non-tufted graminoid	SH	Small Herb
SC	Scrambler		

Table A3.1: Swampy Woodland planting list for Net Gain offset sites: Readymix Mt. Shamrock Quarry

Life form	Species	Common name
T	*Acacia melanoxylon*	Blackwood
T	*Eucalyptus fulgens*	Green Scentbark
T	*Eucalyptus ovata*	Swamp Gum
T	*Eucalyptus viminalis*	Manna Gum
MS	*Acacia verticillata*	Prickly Moses
MS	*Coprosma quadrifida*	Prickly Currant-bush
MS	*Leptospermum continentale*	Prickly Tea-tree
MS	*Melaleuca ericifolia*	Swamp Paperbark
MS	*Ozothamnus ferrugineus*	Tree Everlasting
TF	*Cyathea australis*	Rough Tree-fern
LNG	*Gahnia radula*	Thatch Saw-sedge
LTG	*Carex appressa*	Tall Sedge
LTG	*Lepidosperma elatius*	Tall Sword-sedge
LTG	*Poa labillardierei*	Common Tussock-grass
MH	*Acaena novae-zelandiae*	Bidgee-widgee
MNG	*Microlaena stipoides*	Weeping Grass
MTG	*Lomandra longifolia*	Spiny-headed Mat-rush
MTG	*Poa morrisii*	Soft Tussock-grass
SC	*Billardiera scandens*	Common Apple-berry
SC	*Rubus parvifolius*	Small-leaf Bramble
SH	*Geranium potentilloides*	Soft Cranesbill
SH	*Wahlenbergia gracilis*	Sprawling Bluebell

APPENDIX 4
Woody Weeds within the Offset Site

Sweet Briar *Rosa rubiginosa*

Sweet Briar (or Briar Rose) is a deciduous shrub up to 3m high which has stems covered with sharp curved prickles. The leaves are divided into 5-7 leaflets with finely serrated margins, and fine prickles on the leaf stalks. Flowers are pale pink and appear in spring, followed by bright red rose hips. Sweet briar spreads by seeds which are bird dispersed.

Management: The most effective control method for the small patches of Sweet Briar in the reserve is using the cut-paint method. This should be undertaken in spring/summer when the plants are actively growing. Cut material with fruit should be disposed of safely, and follow up treatments may be required, as larger plants will often resprout. Smaller plants can be dug out, but to prevent regrowth the crown should be removed from the site.

Hawthorn *Crateagus monogyna*

Hawthorn is a deciduous small shrub to tree to 10m, once widely used for hedges. It has thorny branches and deeply lobed, small bright green leaves. White or pink flowers in spring are followed in autumn by red berries. Hawthorn reproduces by seed, which is dispersed by birds, foxes, possums, stock and water.

Management: Plants should be treated using the cut-paint method (for best results apply when plants are healthy and there is good foliage cover).

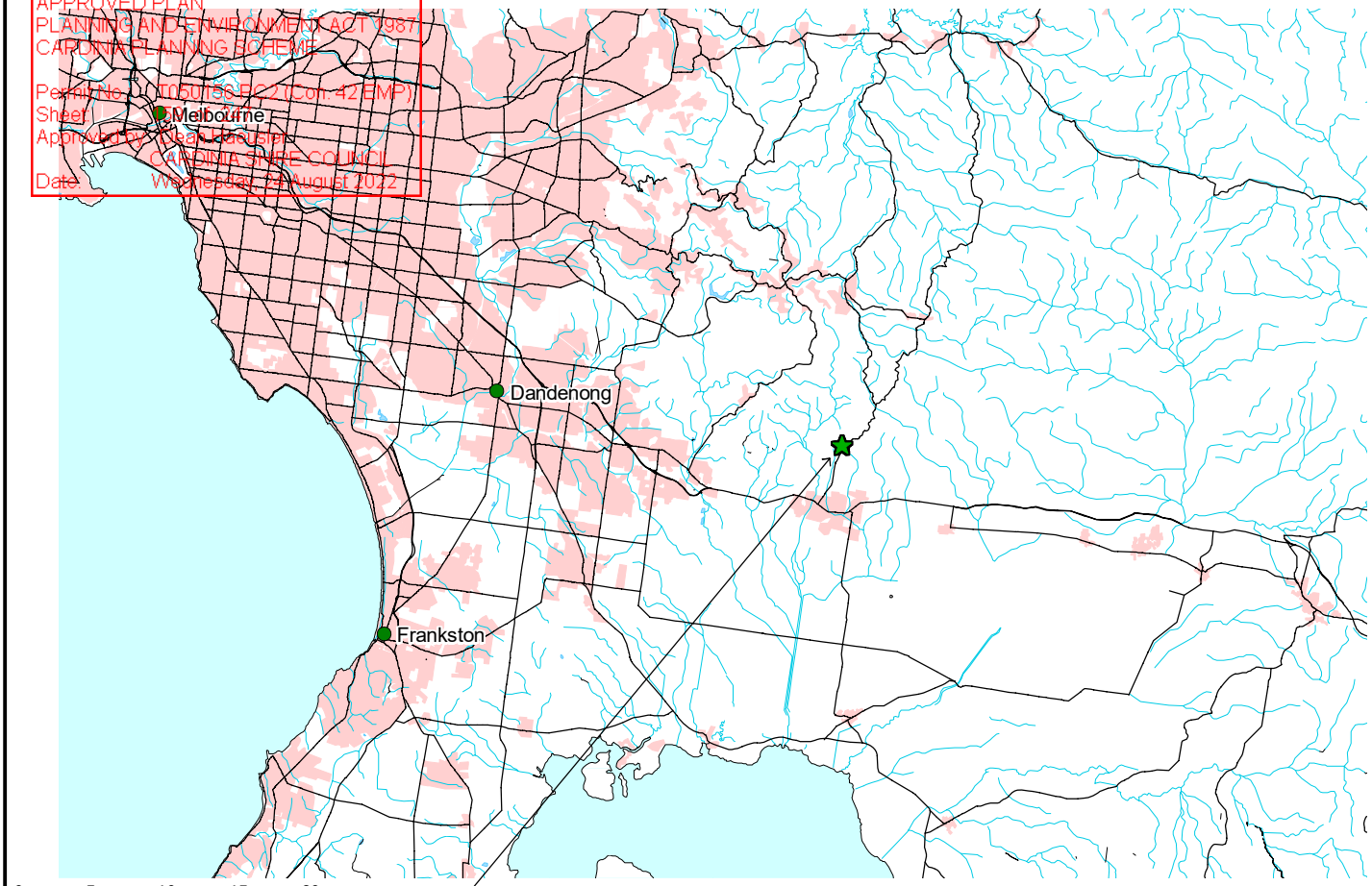
Blackberry *Rubus fruticosus* spp. agg.

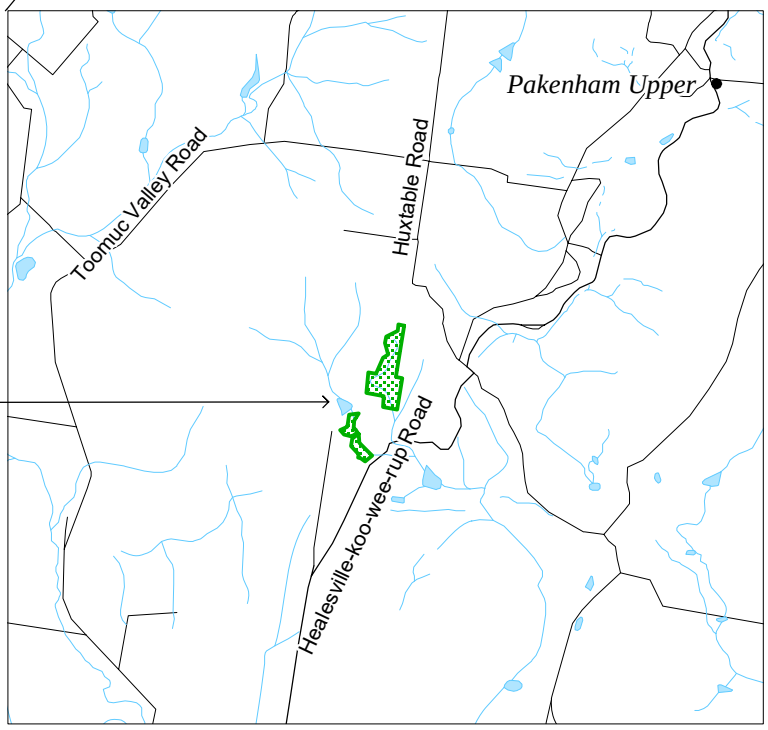
Blackberry is a semi-erect mound-forming shrub with arching, thorned stems to over two metres long. Leaves support three to seven leaflets which are typically discolourous, being lighter underneath. White or pink flowers appear in spring producing succulent fruit to 10 mm in diameter.

Reproduces vegetatively and by seed which is dispersed by birds and foxes. Small fragments of this plant can form new plants so care needs to be taken to remove or destroy all material present.

Management: Dense thickets of this species should be manually removed or burnt. Regrowth is then sprayed. Regular follow-up control is required to destroy resprouting material and new seedlings.

FIGURES





Study area

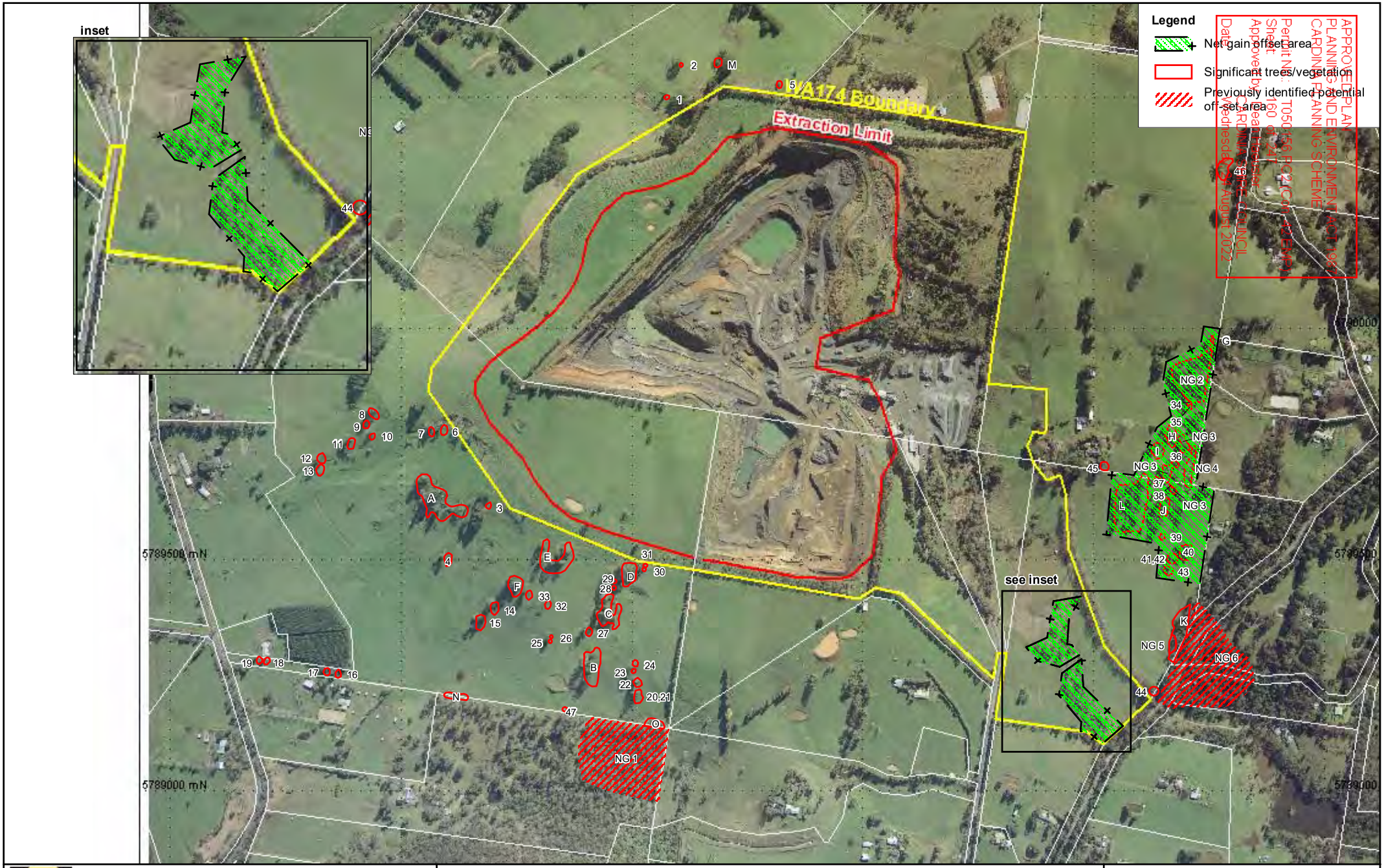
Biosis Research Pty. Ltd.
38 Bertie Street
(PO Box 489)
Port Melbourne
VICTORIA 3207

Figure 1: Location of the study area

DATE: 30 January 2008
Checked by: SGM | Drawn by: MTP | File number: 6738
Location: ..\6738\Mapping\6738 Fig 1.wor

Scale: 0 0.5 1.0 1.5 2.0 kilometres

MGA Zone 55



Biosis Research Pty. Ltd.
38 Bertie Street
(PO Box 489)
Port Melbourne
VICTORIA 3207

Figure 2: Location of the net gain offset sites for the Mt Shamrock quarry, Pakenham

DATE: 29 January 2008
Checked by: SGM
File number: 6738
Location: ...P:\MRG 6700s\6738\Mapping\6738 Fig 2.wor

Scale: 0 75 150 225 300 375 metres

Figure 2: Location of the net gain offset sites for the Mt Shamrock quarry, Pakenham

Appendix 10

CONSENT TO DISTURB

Wurundjeri Tribe Land & Compensation Cultural Heritage Council Inc.

Address: 1st Floor, Providence, 1 St Heliers Street, Abbotsford VIC 3067
Postal Address: PO Box 516, North Carlton 3054 Victoria
Phone/Fax: 9388 2561 Mobile: 0400 145 481
Email: wurundjericouncil@yahoo.com.au
Registration Number: A0005530A
ABN: 54272 749 968

3rd January 2008

Adam MacKenzie
Quarry Planning & Development Manager
Rinker Australia Pty Limited
35 Cotham Rd Kew VIC 3101

Dear Adam

Mt Shamrock Site AAV7921-680 – Shamrock AS1 – Wurundjeri Council Motion

Further to our on-site meeting late last year I am writing to inform you that the Elders on the Wurundjeri Council Committee of Management have met and have passed a motion concerning the final stages of the heritage clearance process for Mt Shamrock site AAV7921-680 – Shamrock AS1. The motion is as follows:

> "That the committee of management resolves [21 December 2007] the following in relation to the heritage clearance process at Mt Shamrock site AAV7921-680 – Shamrock AS1:
>
> - That the extensive controlled archaeological excavation that has occurred at the Mt Shamrock site AAV7921-680 – Shamrock AS1, involving over 25 Wurundjeri workers over the past 4 months, has adequately assessed the Aboriginal occupation of the site.
> - That the remaining artefact laden soil deposits be sieved by Wurundjeri monitors for a period of 2 months with two sieves and that those artefacts be analysed by the archaeologist before returning them to the Wurundjeri.
> - That 5 representatives of the Wurundjeri council will be engaged at any one time to carry out the sieving process.
> - That 2 representatives must be present during the scraping and stock piling of soil for sieving.
> - That Di Kerr continue her role as lead monitor and all monitors take direction from her.
> - That the remaining artefact laden soil deposits be moved to the edge of the quarry to ensure that they remain on the site. This removal must be monitored by Wurundjeri representatives in order that any artefacts found can be analysed by the archaeologist".

This motion has been passed within the context of the Consent to Disturb issued to Readymix on 17th May 2007 and in light of the extensive progress that has been made on the archaeological investigations at the site since August 2007. The Committee of Management noted that a large amount of controlled excavation had occurred at the site and agreed with the archaeologist's

assessment that the occupation of the site had been thoroughly investigated by the controlled excavation. To this end it was agreed that no further controlled excavation was necessary. As you are aware, this view was supported by members of the Council who attended an on-site meeting late last year.

In terms of the way forward, we will work to ensure that we have workers available to finalise the heritage clearance process at this particular site. We recognise that there will not be an archaeologist available to ferry workers and so will inform workers that they will need to make their own way to the site and that they will not be able to leave the site to go to the shops at lunch time. You will note that the Committee of Management has opted to maintain Di Kerr in her role as lead monitor as we believe that this will facilitate an effective working environment.

The Wurundjeri Council appreciates all that Readymix has done to facilitate our workers' participation in the heritage clearance process at Mt Shamrock. We look forward to working with you and your Mt Shamrock team over the next couple of months to finalise this process at Mt Shamrock site AAV7921-680 – Shamrock AS1.

Please feel free to contact on 0400 145 481 or 9416 2905 to discuss this matter further.

Yours sincerely

Megan Goulding
Interim Chief Executive Officer

Wurundjeri Tribe Land & Compensation Cultural Heritage Council Inc.

Address: 322 Park Street, North Carlton 3054 Victoria
Postal Address: PO Box 516, North Carlton 3054 Victoria
Phone/Fax: 9388 2561 Mobile: 0400 145 481
Email: wurundjericouncil@yahoo.com.au
Registration Number: A0005530A
ABN: 54272 749 968

Date: 17th May 2007

John Hann
General Manager, Quarry Planing & Development
Rinker Australia Pty Limited
PO Box 5697
West Chatswood, NSW, 1515

Dear John,

CONSENT TO DISTURB

- AAV 7921-651 – Shamrock IA1
- AAV 7921-678 – Shamrock IA2
- AAV 7921-679 – Shamrock IA3
- AAV 7921-680 – Shamrock AS1
- AAV 7921-681 – Shamrock AS2
- AAV 7921-697 – Shamrock IA4

I, Megan Goulding, the interim Chief Executive Officer of the Wurundjeri Tribe Land Compensation and Cultural Heritage Council Incorporated, give consent under 21U(4) of the Aboriginal and Torres Strait Islander Heritage Protection Act 1984, to the disturbance of the Indigenous sites AAV 7921-651 – Shamrock IA1, AAV 7921-679 – Shamrock IA3, AAV 7921-678 – Shamrock IA2, AAV 7921-680 – Shamrock AS1, AAV 7921-681 – Shamrock AS2 and AAV 7921-697 – Shamrock IA4 and all Aboriginal objects and places within the proposed extraction limit (as at Attachment A) in strict accordance with the conditions outlined in this permit.

This permit is for:

Rinker Australia Pty Limited

Permit Conditions:

1. A copy of this permit must be on-site and available for inspection during works associated with this permit.
2. That upon the discovery of suspected human remains all works must cease. The Wurundjeri Tribe Land Compensation and Cultural Heritage Council Inc. interim Chief Executive Officer, Aboriginal Affairs Victoria, the Victoria Police and the State Coroner's Office must be notified immediately.

Controlled Archaeological Excavation - AAV 7921-680 – Shamrock AS1

3. Before any ground disturbance there will be controlled hand excavation of 100% of the archaeological deposits at site AAV7921-680 – Shamrock AS1.
4. This excavation will be conducted by a qualified archaeologist and involve representative/s from the Wurundjeri Council.
5. The archaeological excavation and recording methods will meet the standards set out in the Guideline for Conducting Aboriginal Heritage Assessments (set by Aboriginal Affairs Victoria (AAV)).
6. Following the completion of the excavation there will be analysis of the artefacts excavated and a report produced outlining the results of this analysis.

Sieving of Site Deposits - AAV 7921-679 – Shamrock IA3, AAV 7921-678 – Shamrock IA2, AAV 7921-681 – Shamrock AS2 and AAV 7921-697 – Shamrock IA4

7. The sites listed above will be subject to mechanical scrapes to a depth of between in 10-15cm to allow identification of any Aboriginal cultural material.
8. The scrapes will continue to sterile deposits.
9. In the event that stratigraphic deposits or some other important Aboriginal cultural feature is uncovered during these scrapes, all work will stop and the deposits will be excavated by controlled excavation.
10. Any such deposits excavated by controlled excavation will be analysed and reported upon to the standards outlined in the AAV Guideline for Conducting Aboriginal Heritage Assessments.
11. All soil mechanically excavated at each of the above listed sites will be mechanically sieved to ensure retrieval of all artefacts down to sterile deposits, as per the definitions set out in Clause 6 of the agreement between the Wurundjeri Council and Rinker Australia Pty Limited (as attached at Annexure B).
12. This process involving artefact identification during sieving will be carried out by a qualified archaeologist and will involve representatives from the Wurundjeri Council.
13. Any artefacts found in a non-stratigraphic context will be photographed and recorded by a qualified archaeologist. This material will be analysed and appropriately documented by an archaeologist.

Monitoring Ground Disturbance

14. Prior to construction works commencing in the proposed extraction limit there will be monitoring of the disturbance of soil deposits by an archaeologist and representatives from the Wurundjeri Council.
15. Areas of ground surrounding the known sites and within the proposed extraction limit will be subject to mechanical scrapes to a depth of between in 10-15cm to allow identification of any Aboriginal cultural material.

16. The scrapes will continue to sterile deposits.
17. There will be at least one Wurundjeri representative assigned to each scraper.
18. In the event that stratigraphic deposits or some other important cultural feature is uncovered during these scrapes, all work will stop and the deposits excavated by controlled excavation.
19. Any such deposits excavated by controlled excavation will be analysed and reported upon to the standards outlined in the AAV Guideline for Conducting Aboriginal Heritage Assessments.
20. Any artefacts found in a non-stratigraphic context will be photographed and recorded by a qualified archaeologist. This material will be analysed and appropriately documented by an archaeologist.

Artefacts

21. Once all artefacts found have been properly analysed they will be returned to the Wurundjeri Council and will be relocated within the general vicinity at the discretion of the Wurundjeri Council.

Environmental Review Committee

22. A member of the Wurundjeri Tribe Land Compensation and Cultural Heritage Council Inc. will participate on the Environmental Review Committee.

Administrative Processing Fee

23. An administrative processing fee of $2,200.00 (GST inclusive) for each site is payable to the Wurundjeri Tribe Land Compensation and Cultural Heritage Council Inc. at the above address within 14 days.

Agreement

24. This consent is provided subject to the terms of the Agreement between Rinker Australia Pty Limited and the Wurundjeri Tribe Land Compensation and Cultural Heritage Council Inc. (Annexure B).

17/5/2007

Megan Goulding
Interim Chief Executive Officer

This permit is for the life of the project

APPROVED PLAN
PLANNING AND ENVIRONMENT ACT 1987
CARDINIA PLANNING SCHEME

Permit No.: T050156 PC2 (Con. 42 EMP)
Sheet: 167 of 247
Approved by: Dean Haeusler
CARDINIA SHIRE COUNCIL
Date: [illegible] 2022

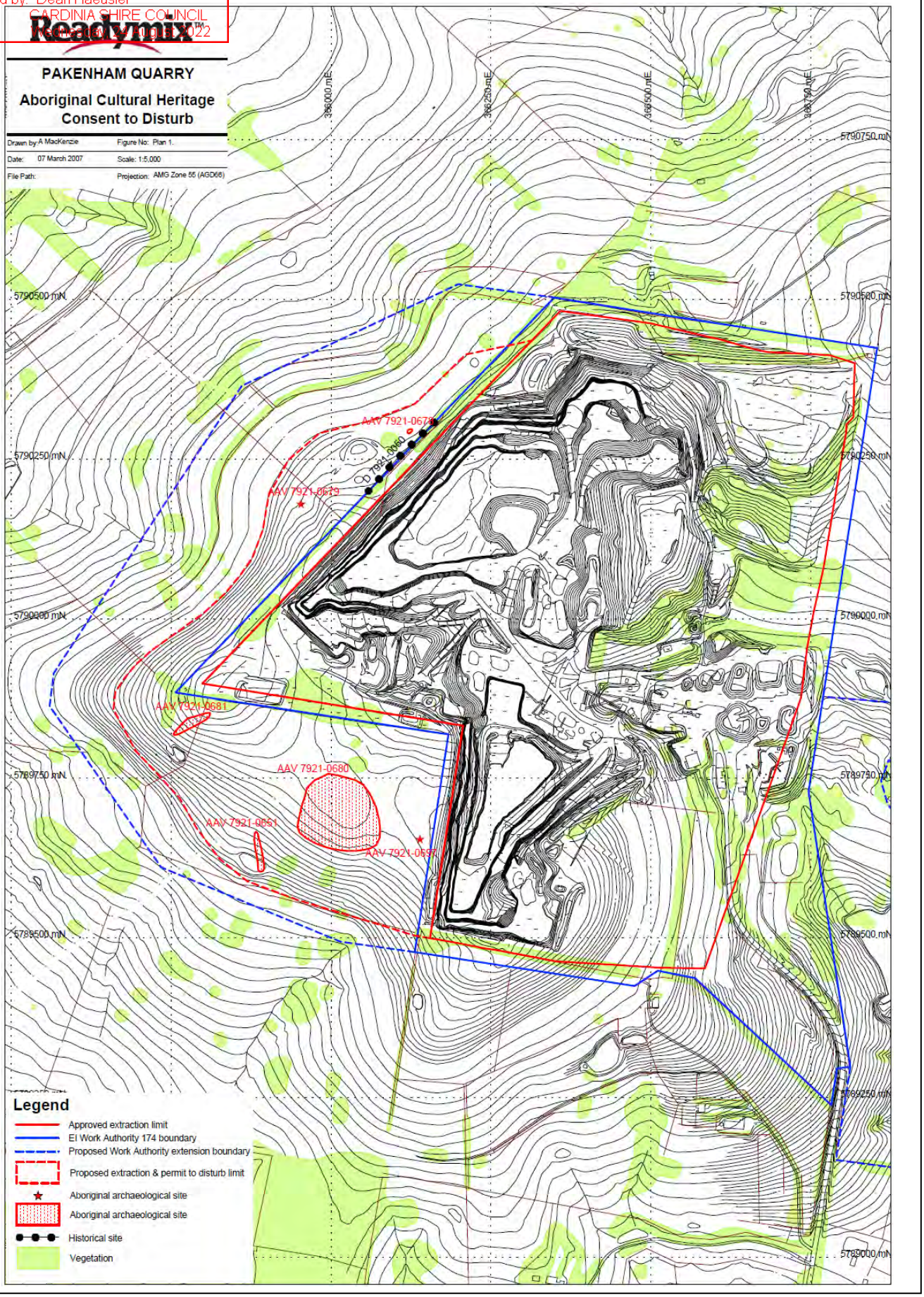
Attachment A – Plan showing the proposed Extraction Limit

Readymix

PAKENHAM QUARRY

Aboriginal Cultural Heritage Consent to Disturb

Drawn by: A MacKenzie | Figure No: Plan 1.
Date: 07 March 2007 | Scale: 1:5,000
File Path: | Projection: AMG Zone 55 (AGD66)



Environmental Monitoring Schedule

Mt Shamrock Quarry - Pakenham

Reviewed - January 2021

Appendix 11

Mt Shamrock Quarry – Pakenham
Monitoring Schedule Summary

This document summarises the monitoring and testing requirements for the development and operation of the Holcim (Australia) Pty Limited quarry located at Mt Shamrock, Pakenham. The accompanying Locality Plan (Figure 1) shows the monitoring and testing locations referred to by the various schedules.

It is intended that the results of the monitoring will be reviewed at least annually and the schedule revised as necessary to ensure effective control of the impacts of the development and operations.

Wherever possible, monitoring will be conducted by trained Holcim personnel.

Item	Test	Done By	Frequency	Standard / Criteria
Airborne Dust	Deposition	Specialist consultants	Monthly	Planning Permit Conditions
Operating Noise	Noise Monitoring (hand-held)	Technical officer	Fortnightly Daily as required	State Environmental Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1, 1989 (as amended)
Blasting	Air Blast Ground Vibration	Shot Firer / Manager / Specialist consultant	Each blast	Planning Permit Conditions
Surface Water	As per licence conditions	Holcim Personnel / Specialist consultants	When discharging	EPA discharge licence 544
Ground Water	Level Gauging	Holcim Personnel Specialist consultants	Monthly 3 monthly	AECOM annual report
In Pit water levels	Level Gauging	Holcim Personnel Specialist consultants	3 Monthly	AECOM annual report
Slope Stability Donazzan's Dam	Visual assessment Geotechnical Report	Holcim Personnel & Specialist consultants as required Specialist consultants	6-monthly, Annually 5 years	Planning Permit Conditions
Greenhouse Gases	Recording power usage	Holcim personnel	Annually	EPA Publication No. 824
Traffic Management	Visual assessment	Holcim personnel	Monthly	Planning Permit Conditions
Net Gain Offset Site	Management Audit	Specialist consultants	End of years 1, 2, 5, 7 & 10	Competed
Fire Management	Inspections, AS1851	Holcim personnel	6-monthly, annually	Australian Standard
Rehabilitation & Vegetation	Landscape Report Status Report & Recommendation	Holcim Personnel Specialist consultants	Annually 5 Year	Work Authority Conditions

Note: See locality plan for legend to monitoring locations

Appendix 11

HOLCIM, MOUNT SHAMROCK QUARRY PAKENHAM

Figure 1: Environmental Monitoring Locations

Appendix 11

MONITORING STATION LOCATIONS

Monitoring Station		Description	GPS Co-ordinates
A1	Air Monitoring	Continuous Airborne Fine Particles (Reactive Monitor), Deposition dust gauge	38° 1'58.51"S,145°28'5.14"E
A2	Air Monitoring	Deposition dust	38° 1'27.69"S 145°27'58.87"E
A3	Air Monitoring	Continuous Airborne Fine Particles (Reactive Monitor), Deposition dust gauge	38° 1'8.48"S,145°28'40.25"E
A4	Air Monitoring	Continuous Airborne Fine Particles (Reactive Monitor), Deposition dust gauge	38° 1'16.86"S,145°29'4.63"E
A5	Air Monitoring	Deposition dust	38° 1'58.93"S,145°28'52.02"E
A6	Air Monitoring	Continuous Airborne Fine Particles (Reactive Monitor), Deposition dust	38° 1'43.16"S,145°29'13.40"E
N1	Noise Survey Point	Routine and Periodic Noise Monitoring	38° 1'58.51"S,145°28'5.14"E
N2	Noise Survey Point	Routine and Periodic Noise Monitoring	38° 1'27.69"S 145°27'58.87"E
N3	Noise Survey Point	Routine and Periodic Noise Monitoring	S 381.4133 E14528.0344
N4	Noise Survey Point	Routine and Periodic Noise Monitoring	38° 1'8.48"S,145°28'40.25"E
N5	Noise Survey Point	Routine and Periodic Noise Monitoring	38° 1'58.93"S,145°28'52.02"
N6	Noise Survey Point	Routine and Periodic Noise Monitoring	38° 1'58.93"S,145°28'52.02"
N7	Noise Survey Point	Routine and Periodic Noise Monitoring	38° 1'43.16"S,145°29'13.40"E
V1	Vibration/ Overpressure Noise	Every Blast	Quarry Office S 381.4133 E 14528.0344
V2	Vibration/ Overpressure Noise	Every Blast	NE Corner S 381.3703 E 14529.0341
V3	Vibration/ Overpressure Noise	Every Blast	The Rises S 381.4133 E14528.0344
V4	Vibration/ Overpressure Noise	Every Blast	Waterhouse S 382.1009 E 14528.9563
MB01	Groundwater Bore	Monthly (Internal) Quarterly (Specialist)	E366135.13E / 5789516N
MB2C	Groundwater Bore	Monthly (Internal) Quarterly (Specialist)	366232.07E / 5790211.78N
MB3B	Groundwater Bore	Monthly (Internal) Quarterly (Specialist)	365739.25E / 5790087.04N
MB4C	Groundwater Bore	Monthly (Internal) Quarterly (Specialist)	366233.33E /5790213.41N
MB5B	Groundwater Bore	Monthly (Internal) Quarterly (Specialist)	365736.94E / 5790087.88N
MB06	Groundwater Bore	Monthly (Internal) Quarterly (Specialist)	366321.06E / 5790488.4N
S	Weather Station	Continuous monitoring T, RH, Wind speed, Wind Direction	38° 1'43.88"S 145°28'49.06"E
W	V-notch Weir, Surface water discharge	Weekly during discharge	S 38034127 / E 145486.367

Appendix 11

1. Airborne Dust

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Dust Monitoring	Deposition	Technical Officer (certified in accordance with the independent certification procedure)	Monthly	AS/NZS 3580.10.1:2003 : Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method	Dust deposition 4g/m^3/month (no more than 2g/m^3/month greater than background)
A series of locations near sensitive receptors identified based on EPA discussions. (Refer Figure 1 for locations	Airborne Dust (PM_{10}) as µg/m^3	Quarry Manager	Continuous whilst quarry in operation	Real time dust monitoring with data logger and hourly averages. As there is no standard specified. A portable *DustTrak/ Osiris/ Airmetrics* type unit will be employed.	PM_{10} (1 hour ave.) – 64 µg/m^3 *(ie80% of the SEPP AQM criteria of 80 µg/m^3 to enable reactive management of dust emission)*
Weather Station (Refer Figure 1 for Location)	Wind speed and direction	Technical Officer (certified in accordance with the independent certification procedure)	Continuous (hourly averages)	Wind Velocity: AS 2923-1987, Guide for the Measurement of Horizontal Wind for Air Quality Applications	N/A

Appendix 11

2. Operating Noise

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Routine noise monitoring at closest sensitive receptors surrounding the quarry. (see Figure 1)	Noise level at all Monitoring Locations	Technical Officer (independently certified)	Fortnightly	State Environmental Protection Policy (Control of noise from commerce industry and trade) No. N-1 1989 (as amended)	Day 0700-1800hrs 45 dB(A) L_{Aeq}
Periodic noise monitoring at commencement of change in quarry activities e.g. near surface extraction.	Noise level at all Monitoring Locations	Technical Officer (independently certified)	Daily until consistent compliance obtained	State Environmental Protection Policy (Control of noise from commerce industry and trade) No. N-1 1989 (as amended)	Day 0700-1800hrs 45 dB(A) L_{Aeq}
Periodic noise monitoring during noise attenuation mound construction works	Noise level at all Monitoring Locations	Technical Officer (independently certified)	Daily during mound works	State Environmental Protection Policy (Control of noise from commerce industry and trade) No. N-1 1989 (as amended)	Day 0700-1800hrs 68 dB(A) L_{Aeq}
Monitoring in response to a “justified complaint”	Noise level at Complainant’s Residence	Technical Officer (independently certified)	As required	State Environmental Protection Policy (Control of noise from commerce industry and trade) No. N-1 1989 (as amended)	Day 0700-1800hrs 45 dB(A) L_{Aeq}

Appendix 11

3. Blasting

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Monitoring Stations V1, V2,V3 and V4 (refer Fig 1) or as directed by an Inspector.	Peak Particle Velocity (PPV) (Ground Vibration)	Specialist Consultants	Every blast	Department of Primary Industries Environmental Guideline - Ground Vibration and Airblast Limits for Blasting in Mines and Quarries 2001 – New Sites	PPV 5mm/sec for 95% of blasts in 12 Month period.
	Air Blast (Air Vibration)	Specialist Consultants	Every blast		Peak Airblast of 115dBL for 95% of blasts in 12 Month.

Appendix 11

4. Surface & Ground water

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Dams #1 and #2	Visual Inspection for sedimentation and algae.	Technical Officer (independently certified)	At least monthly	Direct Observation	N/A
Settlement Ponds #1 and #2	Visual Inspection for sedimentation and algae.	Technical Officer (independently certified)	At least quarterly	Direct Observation	N/A
Donazzan's Dam	Visual Inspection for spillway erosion, sediment build-up, algae or other objectionable matter.	Technical Officer (independently certified)	Following storm events	Direct Observation plus photo record if changes or damage evident	Non eroding spillway
V-notch Weir	Flow Rate (Volume, time, date and duration of each discharge event)	Technical Officer (independently certified)	Continuous whilst discharge occurs	Standard Spreadsheet calc.	Annual Volume (TBD by EPA)
EPA Sampling Point	As per current EPA licence conditions	Technical Officer (independently certified)	Weekly during discharge	EPA Licence Conditions; Certified Procedure	As per current EPA licence conditions
Monitoring Bore MB01 to MB06	Level Gauging (Standing Water Height)	Specialist consultant Holcim personnel	Quarterly Monthly	AS5667.11:1998 or similar	Plot trends and any significant changes in groundwater levels, report in Site Environmental Management Program

5. Slope Stability

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria#
Overburden Stockpiles, Crushed Stockpiles and Operating Faces	Visual inspection for changes in seepage conditions, cracking, movement (bulging or slips)	Technical Officer (independently certified)	Six monthly (or at completion of overburden placement or removal) After heavy rain	Direct Aerial Observation Walk-over	N/A
Rehabilitation of Operational Areas	Visual inspection for changes in seepage conditions, cracking or movement (bulging or slips)	Technical Officer (independently certified)	Annually	Direct Observation	N/A
Land Slips – Toomuc Valley, general	Visual Inspection of vegetation planting spring and land surface stability	Technical Officer & specialist consultants	Six monthly & after heavy rain	Direct Observation	N/A
Land Slips – Toomuc Valley, closest to blast	Visual Inspection of vegetation planting and land surface stability	Technical Officer (independently certified)	Following each blast	Direct Observation	N/A
New Planting or drainage works	Visual Inspection of vegetation planting and land surface stability	Technical Officer (independently certified)	Within 6 months following works	Direct Observation	N/A

6. Greenhouse Gases

Overall reduction target of 3% in CO_2 – e (t) for combined fuel, electricity and explosives usage.

Item	Test	Responsibility	Frequency	Assessment Methodology
Fuel usage	-	QM	Annual	Usage per tonne
Electricity usage	-	QM	Annual	KWh per tonne
Explosives usage	-	QM	Annual	Tonne per tonne

Appendix 11

Appendix 11

7. Traffic Management

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Construction of left hand turning lane	N/A	QM	6 monthly	Progress status report	Completed
	VicRoads approval		At completion of works	N/A	Completed
Truck wheels clean before entering public roadways	Visual inspection – wheels and roads	Technical Officer	Monthly	Housekeeping check+	No dirt tracked onto public roadways
Spillage of materials from vehicles leaving site	Visual inspection – vehicles and roads	Technical Officer	Monthly	Housekeeping check+	No materials spilled onto public roadways
Truck queuing during early morning movements	Visual inspection – vehicles	Technical Officer	Monthly	Housekeeping check+	No queuing of trucks during early morning movements (pre-7:00am)
'*Trucks must not use engine brakes on Mt Shamrock Road'* signage	Visual inspection	Technical Officer	Monthly	Housekeeping check	Sign is clearly visible to truck drivers leaving the quarry.

Note: + - any daily noted excursions are to be recorded within the incident register.

Appendix 11

8. Nett Gain Offset Management Plan

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Offset Site Management Audit	-	PrM	End of years 1, 2, 5, 7 & 10	DSE, 2004 (reference 7)	Completed

Appendix 11

9. Fire Management

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Fire/evacuation drill	Fire/evacuation alarm sounded without prior notice	Quarry Manager	annually	Quarry Emergency Procedures flip chart	All personnel safely evacuate in timely manner
Smoke detectors	Detector sounded (battery replaced)	Technical Officer	6 monthly	Manufacturer's specification	All units fully operational
Fire prevention works	Inspection	Technical Officer	Annually prior to "Fire Danger Period"	Visual observation	Completed as agreed with Responsible Authority/CFA
Fire fighting equipment – mobile	Equipment fully operational	Technical Officer	6 monthly	Manufacturer's specification	No faults
Fire fighting equipment – other	Systems and equipment fully operational	Technical Officer	AS1851	AS1851 – Maintenance of fire protection systems and equipment	No faults/failures

Appendix 11

10. Dam Integrity

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Dam Integrity	Monthly inspection	Technical Officer	Monthly	Visual inspection, BH1 and BH6	No changes
Dam Integrity Review	To be nominated by Specialist	Specialist Geotechnical Consultant	5 years	To be nominated by Specialist	Certification statement by specialist

Appendix 11

11. Rehabilitation & Vegetation

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Landscape & Rehabilitation Development	Status Report & Recommendation	Independent Expert	2 yearly or as required by DPI Inspector in consultation with Council	Approved Work Plan, Landscape and Rehabilitation Management Plan	Compliance to Work Plan, LRMP
		Rehab Manager	6 monthly	Work Plan, Landscape and Rehabilitation Management Plan	Compliance to Work Plan, LRMP
Litter (Work Authority boundaries and office/ operational areas)	Status Report & Recommendation	Rehab Manager	6 monthly	Work Plan, LRMP	Compliance to Working Plan, LRMP
Erosion & Sediment Control (Work Authority boundaries)	Visual inspection during stripping and earthworks	Rehab Manager	Weekly when stripping	Clear water, (suspended solids test if requested)	
Weed Control (Whole Work Authority Area)	Visual monitoring & Spraying Follow up Inspection & spraying	Rehab Manager	Twice yearly (October, December/ January)	LRMP	Absence of noxious weeds; Effective control achieved

Appendix 12

Ministers Report – EES Assessment

Minister for Planning

8 Nicholson Street
PO Box 500
East Melbourne Victoria 3002
Telephone: (03) 9637 8087
Facsimile: (03) 9637 8921
ABN 90 719 052 204
DX 210098

Ref: MBR003898
File: PLN/2000/1111

08 MAY 2006

Mr Leigh Street
Readymix Holdings Pty Ltd
35 Cotham Road
KEW VIC 3101

Dear Mr Street

READYMIX MT SHAMROCK QUARRY, PAKENHAM - PROPOSED EXTENSION

I am pleased to advise that I have completed my Assessment of Readymix's proposed extension of its Mt Shamrock Quarry at Pakenham. Having had regard to the Environment Effects Statement (EES) that Readymix prepared, public submissions in response to exhibition of the EES and the report of the inquiry panel, I have concluded that the proposal should be allowed to proceed, subject to appropriate conditions. A copy of my Assessment is enclosed for your information.

I have not yet determined planning permit application T050156. I will do so following the determination by the Wurundjeri Tribe Land and Compensation Cultural Heritage Council Inc (the Wurundjeri Council) of your application for Consent to disturb the cultural heritage sites identified through the EES process inside the proposed quarry extension area.

I am also writing to the Minister for Resources, Theo Theophanous MLC, the Wurundjeri Council and the Cardinia Shire Council to provide them with copies of my Assessment.

I appreciate the considerable effort that Readymix has put into the preparation of the EES and participation in other elements of the EES process.

Please contact Mr Jack Krohn of the Department of Sustainability and Environment's Port Phillip Region on 9296 4734 if you have any queries about this matter.

Yours sincerely

ROB HULLS MP
Minister for Planning

Victoria
The Place To Be

ENVIRONMENT EFFECTS ACT 1978

PROPOSED EXTENSION, READYMIX MT SHAMROCK QUARRY, PAKENHAM

ASSESSMENT

APRIL 2006

TABLE OF CONTENTS

1 INTRODUCTION

1.1 Project setting

The Readymix Mount Shamrock Quarry lies approximately five kilometres north of Pakenham, at the northern end of Mount Shamrock Road (see locality plan, Appendix 2). The local topography is undulating as the land falls from the highlands to the north towards the extensive plain that lies between the Princes Highway and Western Port. The Toomuc Valley to the west of the quarry is a key feature of the landscape. Land in the neighbourhood of the subject site is generally cleared (although there are patches and roadside strips of remnant indigenous vegetation) and used for a range of agricultural, pastoral and horticultural purposes. The area also supports dwellings used in conjunction with farms or for rural living purposes, and several tourism-related businesses.

1.2 The Readymix Mt Shamrock Quarry extension proposal

The Mount Shamrock Quarry began operations in the mid 1970s. It has grown over time and through changes of ownership to a regional scale quarry producing crushed basalt products from a deposit of high quality "Older Volcanics" rock. Annual production varies according to demand but has averaged a little less than one million tonnes per annum over recent years.

The current quarry extension proposal involves an additional proposed extraction area of some 20 hectares, generally to the south and west of the existing works area, which covers about 76 hectares. The proposed extension area contains an estimated 20 million tonnes of fresh basalt, as well as some more weathered material and a quantity of overburden. The proposed extension would enable the quarry to continue to produce at current levels for about a further twenty years after commercially viable reserves in the existing work authority area have been exhausted.

The current proposal also adds land used for water management to the work authority area, and surrenders existing extraction entitlements in the north-eastern part of the site. Readymix has decided that the stone resource in this area is uneconomic due to the prohibitive cost of removing overburden and the limited depth of high quality basalt.

2 EES AND STATUTORY PROCESSES

2.1 Requirement for EES under *Environment Effects Act 1978*

In October 2001, Cardinia Shire Council wrote to the Minister for Planning to ask whether an Environment Effects Statement (EES) was required for the proposed extension of the Mt Shamrock Quarry under the *Environment Effects Act* 1978 (EE Act). In January 2002 the then Minister for Planning required CSR Readymix (now Readymix) to prepare an EES in light of potentially significant environmental impacts.

The Department of Infrastructure (subsequently the Department of Sustainability and Environment following the transfer of the Planning portfolio to that department after the November 2002 election) convened a Technical Contact Group (TCG) to advise and assist the proponent to scope and prepare the EES. With advice from the TCG the proponent prepared a

Scoping Document to the satisfaction of the Department, to provide a framework and benchmark for the preparation of the EES. The Scoping Document was finalised in June 2002.

The EES was prepared by Readymix and placed on exhibition from 21 May to 4 July 2005. A total of 117 public submissions were received. In July 2005 I appointed a Panel to conduct an inquiry under the EE Act. The Panel held a Directions hearing on 27 July 2005 and commenced its substantive hearing on Wednesday 17 August 2005. The original Panel Chair, Mr Chris Banon, was obliged to withdraw from the Panel shortly after the Directions hearing due to ill health, and was replaced as Chair for the substantive hearing by Ms Margaret Pitt. The other Panel members, Ms Maggie Baron and Mr Colin Burns, were reappointed to continue in their original roles.

The Inquiry Panel provided its report to me on 30 November 2005. The next step under the EE Act is for me as Minister for Planning to prepare an Assessment of the environmental effects of the proposed extension of the Mt Shamrock Quarry and provide this to relevant decision-makers. These decision-makers must then consider the Assessment before making a decision under a Victorian Act or law whether to allow the proposal to proceed.

2.2 Required statutory decisions

In order to proceed, the Mt Shamrock Quarry extension proposal requires the following statutory decisions to be made:

1) Issue of a planning permit under the Cardinia Planning Scheme;
2) Granting of a Work Authority and approval of a Work Plan under the *Extractive Industries Development Act* 1994 (EID Act) prior to any work commencing; and
3) Provision of Consent to Disturb Aboriginal cultural heritage sites by the Wurundjeri Tribe Land Compensation and Cultural Heritage Council Inc. under the Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act* 1984 and its Regulations.

Readymix already holds a waste discharge licence under the *Environment Protection Act* 1970 (EP Act) for its operations at the site. No amendment to the licence is required for the proposed extension of the quarry to proceed.

The proponent referred the proposal to the Commonwealth Minister for the Environment and Heritage under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). The Minister determined in October 2001 that the proposal is not a controlled action, and therefore does not require assessment or approval under the EPBC Act. The decision was reviewed following correspondence from a third party and was confirmed in June 2002.

The primary decisions required for extractive industry to proceed are for a planning permit to be granted, followed by granting of a Work Authority and approval of a Work Plan under the EID Act by the Department of Primary Industries. The Work Plan is intended to be a variation to the existing Work Plan for the Mt Shamrock Quarry. Prior to exhibition of the EES and advertising of the planning permit application, DPI had endorsed a draft Work Plan prepared by the proponent, indicating DPI's satisfaction that quarrying as proposed could proceed in compliance with relevant technical standards. However, there remains scope for the final approved Work Plan to vary from the endorsed draft Work Plan that was included in

the exhibition package, if a permit is granted but changes are recommended as a result of the EES process.

In January 2002, when the then Minister for Planning announced his decision that an EES was required for the proposal, he foreshadowed his intention to call in any planning permit application for the proposal, in order to optimise the integration of procedures under the EE Act and the *Planning and Environment Act* 1987 (P&E Act). On 31 March 2005 Cardinia Shire Council, having received a planning permit application for the proposal, wrote to ask me to decide the application under section 97C(2) of the P&E Act. On 4 May 2005 I advised Cardinia Shire Council and the proponent that I had agreed to Council's request, and I have since carried out the functions of the responsible authority for the application.

EES investigations have identified a number of Aboriginal cultural heritage sites, comprising artefact scatters and isolated artefacts, within the proposed extension area. These sites may not be disturbed without formal consent from the designated Aboriginal organisation under the Commonwealth *Aboriginal and Torres Strait Islander Cultural Heritage Protection Act* 1984. The designated Aboriginal organisation for the Country that includes the site is the Wurundjeri Tribe Land Compensation and Cultural Heritage Council Inc.

2.3 Panel under *Planning and Environment Act 1987*

On 22 July 2005 the members of the inquiry under the EE Act were appointed as a Panel pursuant to sections 97E, 153 and 155 of the P&E Act to consider submissions on planning permit application no. T050156. The application was advertised in conjunction with the EES.

3 INTEGRATED ASSESSMENT

3.1 Legislative and policy framework

The Assessment of the Mt Shamrock Quarry extension proposal under the EE Act does not in itself constitute a "decision" with respect to the proposal. Rather, this Assessment of environmental effects of the proposal will inform decisions about whether the proposal should be approved. This Assessment needs to be cognisant of the legislation and related policy that provide the framework for required decisions, in as far as they have implications for the consideration of environmental effects.

Planning and Environment Act 1987. Under section 4(1) of the Act, the objectives for planning in Victoria are:

(a) to provide for the fair, orderly, economic and sustainable use and development of land;

(b) to provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity;

(c) to secure a pleasant, efficient and safe working, living and recreational environment for all Victorians and visitors to Victoria,

(d) to conserve and enhance those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest or otherwise of special cultural value;

(e) to protect public utilities and other assets and enable the orderly provision and coordination of public utilities and other facilities for the benefit of the community;

(f) to facilitate development in accordance with the objectives set out in paragraphs (a), (b), (c), (d) and (e);

(g) to balance the present and future interests of all Victorians.

Section 4(2) sets objectives for the planning framework established by the Act, including:

(d) to ensure that the effects on the environment are considered and provide for explicit consideration of economic and social effects when decisions are made about the use and development of land.

The State Planning Policy Framework (SPPF) is the statutory statement of State policy within the Victoria Planning Provisions. Several aspects of the SPPF, which forms part of the Cardinia Planning Scheme, are particularly relevant to the Mt Shamrock Quarry extension proposal. These aspects include:

- Environment (clause 11.03-2)
- Management of resources (clauses 11.03-3 and 12.04-2)
- Economic well-being (clause 11.03-5)
- Better management of metropolitan growth (including urban growth boundary, growth areas and green wedges) (clause 12.02)
- Protection of catchments, waterways and groundwater (clause 15.01)
- Air quality (clause 15.04)
- Noise abatement (clause 15.05)
- Conservation of native flora and fauna (clause 15.09)
- Heritage (clause 15.11)
- Extractive industry (clause 17.09)

Clause 12.02 articulates the principles of *Melbourne 2030* (M2030), which is the State government's strategy to guide the planning and development of Melbourne over the period until 2030. Under M2030, an urban growth boundary (UGB) has been prescribed to place spatial limits on the further expansion of the urban area and to provide explicit protection from urban development for the areas outside the UGB, known as "green wedges". It also establishes growth areas, including the South Eastern Growth Area which has corridors extending eastwards through Pakenham and southwards through Cranbourne.

The Local Planning Policy Framework (LPPF) within the Cardinia Planning Scheme includes relevant references in the Municipal Strategic Statement (MSS), as follows:

- Environment (clause 21.09-1)
- Catchment management (clause 21.09-2)
- Landscape (clause 21.09-3)
- Vegetation and areas of botanical and zoological significance (clause 21.09-4)
- Heritage (clause 21.09-7)
- Extractive industry (clause 21.09-9)

The LPPF also includes a local policy for Aboriginal archaeological sites (clause 22.03).

Under the Cardinia Planning Scheme, the existing Mt Shamrock Quarry and the proposed quarry extension area are zoned "Green Wedge Zone 1", under which a planning permit is required for extractive industry. The zone purposes include: "to recognise, protect and conserve green wedge land for its agricultural, environmental, historic, landscape, recreational and tourism opportunities, and mineral and stone resources ".

The proposed quarry extension area (as well as the existing quarry) is included within an Environmental Significance Overlay 1 (ESO1) which covers much of the northern (hills) part of the Shire. The ESO1 objectives recognise "the significant environmental and landscape values" of the area covered by the overlay.

Extractive Industries Development Act 1994. The purposes of this Act are to "provide a co-ordinated assessment and approvals process for extractive industries [and to] ensure that extractive industry operations are carried out with safe operating standards and in a manner that ensures the rehabilitation of quarried land to a safe and stable landform".

Environment Protection Act 1970. The Environment Protection Act (EP Act) establishes the Environment Protection Authority (EPA), defines EPA's powers, duties and functions and provides a range of instruments that are used to minimise wastes, pollution and environmental risks. Among those instruments are State Environment Protection Policies (SEPPs), works approvals and licences.

As indicated in section 2.2 above, the existing Mt Shamrock Quarry operates under the conditions of a waste discharge licence under the EP Act. Based on current information, the proposed extension of the quarry will not require works approval under the EP Act, nor any change to the conditions of the licence. However, if the extension is to lead to an increased discharge of waste (which will be assessable once flow data currently being collected under the provisions of a recent amendment of the licence are available), a works approval would then be required. The operation will also need to comply with the provisions of relevant SEPPs, including:

- SEPP (Waters of Victoria) provides for protection of surface water quality across the state. Schedule F8 is one of several catchment-specific schedules included in SEPP (Waters of Victoria). Schedule F8 designates geographical segments of the Bay and its catchment, with different suites of protected beneficial uses, environmental objectives and indicators applying in each segment; the quarry site including the proposed extension lies in the Northern Hills segment.
- SEPP (Groundwaters of Victoria) provides for the protection of beneficial uses of groundwater, including the maintenance of ecosystems, water supply and industrial water use.
- SEPP (Air Quality Management) provides for the protection of beneficial uses dependent on clean air quality.
- SEPP N-1 (Control of Noise from Commerce, Industry and Trade), although not of direct statutory application because the site lies outside the defined metropolitan area, provides the criteria for determining site-specific noise limits.

Water Act 1989. This Act applies to the proposed extension of the Mt Shamrock Quarry because of the possible need for a licence to take groundwater arising from the collection and disposal of groundwater seeping into the quarry pit. Among the various purposes of the Act is "to make sure that water resources are conserved and properly managed for sustainable use for the benefit of present and future Victorians" (section 1(d)).

Aboriginal and Torres Strait Islander Cultural Heritage Protection Act 1984. The objectives of the Act are to provide blanket protection for any Aboriginal places or objects from unauthorised destruction. The Act confers powers to grant Consent to disturb cultural heritage sites on designated Aboriginal organisations, in this case the Wurundjeri Council. Administration of the Act is delegated to the State, through Aboriginal Affairs Victoria (AAV), a unit within the Department of Victorian Communities.

3.2 Evaluation objectives

In light of the legislative and policy framework that applies to the Mt Shamrock Quarry extension proposal, as well as its potential environmental effects and risks, the following evaluation objectives have been formulated to guide an integrated assessment.

1) To provide for the environmentally acceptable extraction of stone from land contiguous with the existing Mt Shamrock Quarry, generally in accordance with the endorsed draft Work Plan attached to planning permit application no. T050156.
2) To avoid or minimise as far as practicable impacts on public amenity, especially with respect to noise and vibration.
3) To minimise adverse impacts on local and regional visual and landscape values.
4) To avoid significant adverse ecological impacts on native vegetation communities and species on or adjacent to the site, and to provide for an effective "Net Gain" outcome in the context of *Victoria's Native Vegetation Management – A Framework for Action.*
5) To minimise adverse impacts on native fauna.
6) To protect surface water quality and groundwater resources from significant adverse impacts, consistent with the provisions of relevant State environment protection policies.
7) To protect air quality consistent with the provisions of relevant State environment protection policy.
8) To avoid as far as practicable adverse impacts on sites of Aboriginal or post-settlement cultural heritage.
9) To avoid significantly increased risk to the stability of slopes external to the proposed extended quarry.
10) To establish the basis for an environmentally, economically and socially acceptable rehabilitation plan and end use for the project area, with particular attention to the long-term stability of the constructed internal landform.
11) To achieve a net community benefit with respect to overall social, economic and ecological outcomes.

3.3 Integrated assessment

3.3.1 To provide for the environmentally acceptable extraction of stone from land contiguous with the existing Mt Shamrock Quarry, generally in accordance with the endorsed draft Work Plan attached to planning permit application no. T050156

The Mount Shamrock Quarry produces a substantial volume (averaging close to one million tonnes per annum) of crushed rock products from a regionally significant Older Volcanics basalt resource. The Mount Shamrock Quarry is one of very few quarries in the eastern metropolitan region that produces stone meeting VicRoads' highest quality specifications for road pavement material. The resource in the proposed extension area represents approximately twenty years' supply at current production rates.

The draft Work Plan for the proposed extension was endorsed by the Department of Primary Industries (DPI) prior to its lodgement as part of planning permit application no. T050156. This indicates that DPI is satisfied the stone can be quarried consistently with current regulations and operational standards, and that the site can be adequately rehabilitated. There is provision for refinement of the draft Work Plan in the light of the EES process, and particularly this Assessment, before it is approved, provided that a planning permit has been issued. The planning permit is the principal approval required for the proposal: it will only be issued if the proposal is found to be acceptable on environmental, social and economic grounds, as well as on technical grounds, subject to relevant conditions.

I note that the quarry lies close to the north boundary of the South Eastern Growth Area, one of five urban development corridors identified under M2030. The Growth Area is likely to be a major consumer of high quality crushed rock products over the period through which the quarry extension is projected to be productive. I also note that extractive industry is explicitly identified under M2030 as an appropriate land use in green wedges, subject to compliance with relevant environmental performance criteria.

Because of their relatively low value in terms of weight and volume, the cost of crushed rock products to the consumer heavily reflects the cost of transporting the material from the quarry to the site at which it is to be used. Therefore, there is considerable economic benefit to the community at large in terms of development cost savings for the South Eastern Growth Area to have a quarry capable of producing significant volumes of high quality crushed rock products, suitable for a broad range of construction uses, located in close proximity to the Growth Area.

I note that the proposal represents an extension of an existing quarry that has been operating continuously since 1974. I accept the principle that (subject to other constraints) it is preferable to continue to exploit a resource that is already being exploited than to pursue a replacement resource from an alternative greenfield location.

The EES process has enabled the exhaustive consideration of the potential environmental impacts and risks of the proposal through a public process. However, I note that the consideration of cultural heritage issues by the Wurundjeri Tribe Land Compensation and Cultural Heritage Council Inc will involve appraisal of cultural values that have not been fully explored through the EES process. While the cultural heritage values of the site are discussed below, this Assessment does not presume to recommend to the Council whether it should or should not grant consent to disturb the Indigenous cultural heritage sites that have been discovered within the proposed extension area.

I note the Panel's finding that: "... the Panel has concluded that the proposed extension of the Mt Shamrock Quarry should be approved, subject to adoption of the many recommendations for improvements to the proposal and the conditions and other requirements that should be applied to it, as set out in [the Panel's] report" (page 185).

For all of the above reasons, and having regard to the Panel's analysis, it is my assessment that the proposed extension of the Mt Shamrock Quarry can proceed in an environmentally acceptable manner, subject to the detailed comments and recommendations contained elsewhere in this Assessment. Therefore, subject to the Wurundjeri Council's granting of Consent to disturb Indigenous cultural heritage sites within the proposed quarry extension area, the proposal should be approved under the P&E Act and the EID Act with appropriate conditions.

3.3.2 To avoid or minimise as far as practicable impacts on public amenity, especially with respect to noise and vibration.

"Amenity" is a generic term encompassing "the quality of being pleasant in situation, prospect, disposition, etc; pleasantness" (The Macquarie Dictionary, 1981). In the planning context it captures such issues as noise, vibration, dust, odour, visual impact and so forth, although in terms of this Assessment some of those components of amenity are dealt with separately.

It is important to appreciate that for the purposes of the EES process the focus is the extension proposal, considered in the context of the existing quarry operation as the "base case". It is also important to accept that amenity is not fixed, and that the statutory criteria for some environmental parameters are not framed to require the impacts of development to be undetectable at a local level. In other words, amenity is protected in a general sense but not to the extent that certain conditions contributing to amenity may not change within defined limits, whether those limits are qualitative or quantitative.

The existing quarry operation has inevitably impacted to some degree on the amenity of its neighbourhood. There are some limited views into the quarry. At times quarry operations are audible outside the site, and vibrations arising from blasting operations are variably perceptible at locations outside the site (variation arising from the location and aspect of the blast, prevailing weather conditions and other factors). The amenity of the neighbourhood is also partly resultant from and dependent upon the history and current uses of land, including clearance of native vegetation, farming and tourism operations and local and regional traffic. It is in this context that the impacts of the proposed extension of the quarry on amenity must be assessed.

Ground and air vibration

Quantitative limits for vibration are specified under DPI's environmental guideline *Ground Vibration and Airblast Limits for Blasting in Mines and Quarries 2001*. The limits are to be met at sensitive receivers off-site, in this case neighbouring houses. Because of the variable nature of propagation of vibration, different houses may be most exposed to vibration from different blasts.

The proponent has agreed that the whole quarrying operation (not just quarrying within the extension area) will be bound by the slightly more stringent requirements for new quarries.

The limits set (maximum ground vibration of 10 mm/ sec, 95% of blasts to be no greater than 5 mm/ sec; maximum air vibration of 120 dB(L), 95% of blasts to be no greater than 115 dB(L)) are intended to protect human health and property from damage with a considerable safety margin. There are various methods available to the operator to manage the impacts of blasting so that the limits are consistently met; usual regulatory practice is to set the performance requirements and allow the operator to determine what measures will be adopted in the circumstances to meet those requirements. It is also normal approvals practice to impose monitoring obligations on the operator to ensure that vibration levels for each blast are measured at appropriate locations so that performance against the limits can be verified and breaches detected.

It is my assessment that the measures proposed by Readymix through the EES process for the management, mitigation and monitoring of ground and air vibration resulting from blasting are generally appropriate, and should enable consistent compliance with the guideline limits designated for new quarries.

Noise

No statutory noise limits are imposed under State environment protection policy. SEPP N-1 (Control of Noise from Commerce, Industry and Trade) does not apply outside the Melbourne metropolitan area (as defined in the SEPP) but can be used in the context of EPA's *Interim Guidelines for Control of Noise in Country Victoria* (N3/89) to derive project-specific noise limits. Although consultants commissioned by the proponent and consultants commissioned by objectors presented slightly different background noise measurements, I note that in discussion before the Panel agreement was reached to adopt the lowest calculable noise limit of 45dB(A) for daytime, which provides maximum allowance for the low background noise levels characteristic of quiet rural locations. I also note that the Panel has recommended that the limit should not be specified in the permit as later work might arrive at a higher background noise measurement, leading to derivation of a different noise limit. However, I believe it is in the best interests of all parties that the permit should set a quantitative performance measure, which could be amended if necessary at a later date. Accordingly, it is my assessment that the lowest noise limit calculable under SEPP N-1 of 45 dB(A)$_{L90}$ during the daytime should apply. The lower evening and night-time noise limits are best addressed by prescribing hours of operation for the quarry that exclude those periods, as is the case with the existing planning permits for the current quarry operation.

I note that the draft Work Plan provides information about a number of measures that Readymix proposes to take to contribute towards compliance with the performance standard, which is to be met at neighbouring dwellings. I also note that the Panel has found itself unable to conclude categorically whether those measures, if implemented, will or will not enable consistent compliance with the proposed noise limit. However, I am satisfied that it should be practicable for the proponent to institute management and other measures that should enable adequate mitigation of noise in compliance with the specified limit. If necessary, such measures could include temporary cessation of certain noise-generating activities for the duration of unfavourable conditions. I note that the onus of ensuring compliance with all conditions of statutory approval - including the noise limit – will lie with the operator.

I note that the proposed quarry extension will provide for the quarry to operate for a further two decades. I also note that under Clause 52.09 of the Victoria Planning Provisions (VPPs): "Permits for extractive industry must not include conditions which require the use to cease by a specified date" (except in circumstances that do not apply in this case). This reflects the view that it is inappropriate to close existing operations while commercially viable resources remain to be won, provided they can meet relevant environmental and technical standards.

If the proposed extension proceeds, the Mount Shamrock Quarry will be a part of the Toomuc Valley neighbourhood for many years to come. It is incumbent upon Readymix as the current quarry operator, and upon any future quarry operator, to adopt a proactive "good neighbour" policy. This should go beyond mere compliance with statutory requirements (while such compliance obviously remains essential) and embrace openness in dealing with the community, continuous improvement of operational aspects that relate to off-site impacts and support for and appropriate participation in community programs to protect and enhance the environment. It is not intended to prescribe in this Assessment the measures that should be taken in this regard, nor is it intended to imply that Readymix has made no such efforts in the past. However, the nature of the relationship between the quarry and its neighbours is a factor that contributes to some extent to the amenity of the neighbourhood. It is desirable that Readymix should make a sustained effort to improve that relationship, for the benefit of all parties.

3.3.3 To minimise adverse impacts on local and regional visual and landscape values.

Mt Shamrock Quarry is located in the toe of a basalt flow that originated to the north, probably following what was then the course of a stream. Over time since the flow, the former higher ground to either side of the flow has eroded, creating the Toomuc Valley to the west and a somewhat more complex topography to the east, separated by a basalt-capped ridge.

Because of the relative elevation of the quarry (the current lip being at about 200 metres AHD, over 100 metres above the Toomuc Valley floor), views into it are quite restricted. The quarry plant can be seen from vantage points in Lilliput Lane and, further east, from Dore Road. There are distant views including the southern faces of the quarry walls from points to the north including Paternoster Road. Although there are no clear views of the quarry from Huxtable Road itself, views including the quarry are available from some points on private properties along Huxtable Road. There are also restricted views from some points high on the western slopes of the Toomuc Valley, for instance around Berglund Road. However, from most vantage points in the Toomuc Valley and to the south, the brow of the hill forms the skyline, with no direct component of the view to indicate that a working quarry lies immediately beyond the horizon.

The Panel has accepted evidence presented by submitters regarding the beauty of the Toomuc Valley landscape. I note that the ESO covering much of the northern part of Cardinia Shire, including the existing quarry and the proposed extension, cites landscape among one of the environmental values to be recognised and protected. I also note that the landscape in the vicinity of the quarry is a modified agricultural landscape, characterised by cleared pasture, linear windbreak plantings and scattered patches of remnant vegetation, as well as small areas of more intensive cultivation, such as vineyards and orchards, and dwellings and other buildings.

The effect of the proposed extension will be to lower the crest of the hill to the south and west of the existing quarry by up to 20 metres. The nature of the topography and existing views to the site, however, is such that the actual change to the landscape resulting from those works will be minor, as the apparent lowering of the hill will not open up views into the quarry pit. Indeed, the existing distant views from the north may be marginally improved by the lowering of the faces currently visible from those vantage points.

Nonetheless, it is important that the extension of the quarry should be undertaken in such a way that its visual and landscape impacts are minimised as far as practicable. This is best done by a program of screening planting on Readymix land below the proposed ultimate southern and western lips of the quarry. Such a program has been proposed in the EES. It is my assessment that completion of the proposed planting program will adequately address the projected visual impacts of the proposal, subject to the following qualifications:

- While staged planting is supported, planting should be undertaken as quickly as practicable, subject to availability of adequate supplies of suitable indigenous species of local provenance;
- The biodiversity and habitat potential of the landscape planting should be optimised by linking planting to remnant indigenous vegetation as far as practicable;
- The lower edge of the plantations should not follow a straight line or a single contour, but should extend further downhill intermittently, especially in drainage lines, to create a less artificial appearance;
- Performance standards should be set whereby the effect of landscape planting in screening views to the extension works area from designated vantage points, to be specified in the Environmental Management Plan, must be achieved to the responsible authority's satisfaction before works on each stage of the extension (as defined in the EES) may commence.

***3.3.4 To avoid significant adverse ecological impacts on native vegetation communities and species on or adjacent to the site, and to provide for an effective "Net Gain" outcome in the context of* Victoria's Native Vegetation Management – A Framework for Action.**

Native vegetation in the area of the proposed extension of the Mount Shamrock Quarry has been largely cleared for farming and other purposes. Only limited remnants are present, adjacent to the north-western and south-western corners of the current quarry pit. Those remnants are generally in poor condition due to disturbance and to their small size and linear shape. There is also a small stand of the State significant Green Scentbark, *Eucalyptus fulgens*, in the extension area south of the existing quarry, although the trees are generally in poor condition due to exposure, and some have been lost by windthrow during the course of the EES process.

I note that some submitters expressed concern about the extent of field survey work by the proponent's ecological consultants. I accept the Panel's conclusion that the level of survey work was adequate, in the context of the disturbed nature, small size and isolation of the remnant indigenous vegetation patches on the site and the use that was made of database information to augment information collected from the site.

Under *Victoria's Native Vegetation Management – A Framework for Action*, requirements are specified for achievement of a "net gain" of native vegetation as a result of vegetation losses

accruing from approved development. Losses and offsets are measured in habitat hectares, a unit that incorporates vegetation quality as well as spatial extent. Offsets are generally required to be achieved in the same bioregion and in the same ecological vegetation class (EVC) as the losses. There are also provisions for offsets for losses of isolated medium and large old trees.

It is my assessment that it will be possible for the calculated offsets (which should be formally finalised and confirmed in consultation with DSE) to be achieved on Readymix's property as a component of the landscape planting. Those parts of the landscape planting designated as offsets will need to comprise as full as possible a suite of grasses and other ground layer and understorey species as well as larger trees and shrubs. All such plants should be derived from local provenance, where possible from material growing in the areas to be cleared to make way for the development.

It is my assessment that the offset area should be clearly identified for permanent protection through an agreement under section 173 of the P&E Act.

3.3.5 To minimise adverse impacts on native fauna.

As noted above, the current habitat values of the proposed extension area are heavily degraded. The area supports only depauperate populations of native fauna, dominated by species common in modified rural landscapes. Although some significant species may occur in the area, there is no evidence to suggest that the existing habitat values of the proposed extension area contribute in any meaningful way to sustaining populations of those species.

It is my assessment that the detailed planning, implementation and management of landscape plantings should seek to optimise the biodiversity benefits that can be derived from such a revegetation program. In particular, care should be taken to optimise the habitat values for local indigenous fauna, and to avoid reinforcing or supporting local populations of exotic species or native species that can cause ecological damage when excessive populations occur (eg Noisy Miners and Bell Miners).

3.3.6 To protect surface water quality and groundwater resources from significant adverse impacts, consistent with the provisions of relevant State environment protection policies.

The existing quarry pit collects groundwater seeping through the basalt towards the underlying Werribee Formation aquifer. Because groundwater enters the pit diffusely and a proportion evaporates before it can collect in the quarry drainage system, it has not yet been possible to quantify the volume of groundwater that the quarry intercepts. However, it seems unlikely that the volume is significant except for the dissolved solids (salts) introduced into the quarry's water management system via groundwater inflows.

Much of the water collected in the quarry (whether from groundwater or precipitation) is reused in processing and dust control. Excess water leaves the quarry to the south-east through a series of channels and dams intended to reduce loads of suspended sediments, nutrients and other pollutants. The discharge is regulated by EPA discharge licence no. DW903. The licence was amended in February 2004 to incorporate the treatment and dilution role of Donazzan's Dam, and to require more detailed monitoring of the volume and quality of water discharged from the site. The discharge enters an unnamed tributary of Kennedy Creek, which in turn joins Deep Creek. No discharge from the works area of the quarry enters Toomuc Creek. However, part of the proposed extension area is within the Toomuc Creek

catchment, and its runoff would be lost to that system if the extension proceeds. The Panel has concluded that the loss of catchment area, in the context of the overall area of Toomuc Creek catchment, is insignificant.

A number of submitters expressed concern that the existing quarry has caused or contributed to diminished flows from a number of springs deriving flows from the Werribee Formation high on the eastern flanks of the Toomuc Valley. It is not a function of the assessment process for the quarry extension proposal to determine the cause of the springs' changed performance in recent years. However, I note that the location of the proposed extension of the quarry relative to the springs in question is such that it seems most improbable that the quarry extension would affect flows from those springs.

It is my assessment that the likely impacts of the proposed extension of the quarry on groundwater and surface water quality are not significant subject to implementation of appropriate management measures as proposed in the EES.

3.3.7 To protect air quality consistent with the provisions of relevant State environment protection policy.

The key air quality issue for the proposed extension of the Mount Shamrock Quarry is dust mobilised from exposed surfaces either mechanically (eg by the wheels of mobile plant) or environmentally (eg by wind). Visible airborne dust can present an aesthetic problem, while fine dust particles, especially those smaller than 10 microns in diameter (PM_{10}), can cause health problems if inhaled in significant quantities over prolonged periods.

Some hard rock quarries can generate dust emissions containing particles of respirable crystalline silica (RCS), which, especially when fresh, can contribute to diseases such as silicosis. However, the basalt extracted from the Mount Shamrock Quarry, including the resource within the proposed extension, is very low in silica content so RCS is not considered to be an issue of concern in this case.

The quarry operation generates emissions of greenhouse gases, primarily due to consumption of electricity and fuel for mobile plant. There may be some potential for progressive reductions in greenhouse contributions from the quarry over time as equipment is upgraded. I note also that the proposed landscape plantings will contribute to some sequestration of carbon. The quarry extension itself will contribute only marginally to changing the rate of greenhouse emissions as a result of different haul distances from working quarry faces to the crushing plant.

Various capital improvement and management measures are available for implementation to reduce dust and greenhouse emissions from the quarry site, including the extension. While the focus of this Assessment is the proposed extension, obviously if the extension proceeds existing quarry operations will continue for a longer period than would otherwise have been the case and to that extent emissions arising from processing plant and other elements of the existing operation are relevant. The Panel has generally endorsed the proposed management and monitoring programs in relation to air quality, and it is my assessment that those measures should generally be implemented, subject to the conditions of the project approvals. I note that the detail of some of the measures should be contained in the EMP, and it is my assessment that when the EMP is submitted to the responsible authority Council should scrutinise it carefully to ensure that it includes all necessary elements.

3.3.8 To avoid as far as practicable adverse impacts on sites of Aboriginal or post-settlement cultural heritage.

Investigations carried out in several stages by Readymix's heritage consultants identified several Aboriginal cultural heritage sites within the proposed quarry extension area. All sites found to date comprise artefact scatters or isolated artefacts. The largest scatter, site no. AAV7921/0680, contains over 200 stone artefacts. None of the sites found in the EES investigations, or any as yet unknown sites that might be discovered later, may be disturbed without consent from the Aboriginal organisation designated under the Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act* 1984, in this case the Wurundjeri Tribe Land Compensation and Cultural Heritage Council Inc (the Wurundjeri Council).

I note that at the time the EES was exhibited the Wurundjeri Council was not in a position to make a formal submission due to ongoing legal proceedings. However, shortly before the Panel hearing commenced the Supreme Court appointed an interim Chief Executive Officer who subsequently represented the Wurundjeri Council at the Panel hearing. I support the Panel's decision to grant leave to the Wurundjeri Council to appear at the Panel hearing.

There is no prescribed public participation stage in the consideration by the designated Aboriginal organisation of an application for "Consent to disturb", and the Panel was not specifically empowered to deal with that consent requirement. However, it is common for proposals subject to the EE Act to require approvals additional to those for which an inquiry Panel has direct jurisdiction. Those are still legitimate matter for the Minister's Assessment, which is advice to decision-makers.

Determination of the cultural significance of any of the sites within the proposed extension area is a matter for the Wurundjeri Council to decide, in accordance with its understanding of the cultural values represented by the sites. I note that the Panel has supported the proposal for the Wurundjeri Council to consult with the Bunurong Land Council, which has expressed its interest in the extension site and believes the site to have been within an area to which the Bunurong people had at least shared access prior to European settlement. It is my assessment that good process would be well served by the Wurundjeri Council as statutory decision-maker consulting with the Bunurong Land Council prior to determining any application for Consent to Disturb. However, while it would clearly be inclusive for the Wurundjeri Council to consult the Bunurong Land Council about an application for consent to disturb, the statutory responsibility for handling any such application rests ultimately with the Wurundjeri Council. Because the cultural values of the sites have not been explored or tested through the EES process, it would not be appropriate for me to advise the Wurundjeri Council whether to grant Consent to disturb, or what conditions should be attached to any such Consent.

With respect to the scientific significance of the identified archaeological sites, especially AAV7921/0680, I note that the EES investigations have enabled the sites to be recorded only in a preliminary sense. It is important to distinguish between obtaining enough information for the Wurundjeri Council to make an informed decision about the Consent to disturb application, and the more extensive further scientific investigation needed to record the sites comprehensively prior to their eventual destruction if Consent to disturb is granted and the quarry extension is to proceed. Therefore, it is my assessment that any site for which Consent

to disturb is granted should be scientifically investigated to the satisfaction of the Heritage Services Branch of AAV, in the interests of improving our understanding of the use of the site by Indigenous people and the better refinement of cultural heritage site prediction models. This should be at the proponent's expense, and in accordance with a study brief to the satisfaction of AAV and the Wurundjeri Council.

Any cultural heritage material recovered from the site, once fully recorded, should be relocated as determined by the Wurundjeri Council, in consultation with the Bunurong Land Council, which might include reburial as an option.

I note that the occurrence of a relatively dense artefact scatter in a hilltop location is not consistent with current site prediction models. I do not consider it appropriate to downgrade the long-term significance of site AAV791/0680 provisionally, on the grounds that if other hilltop sites are discovered in the area it will be "a more common occurrence". This could only be the case after such sites, similar in character to AAV791/0680, have been discovered, and there are no grounds to expect that such discoveries will be made at all, let alone before the Mt Shamrock site may have been destroyed. Therefore, having regard to the Panel's discussion on this matter, it is my assessment that the site should considered as being of high scientific significance.

I support the Panel's recommendation that the quarry extension area surface (other than already identified cultural heritage sites) should be cleared by baling and/or burning off the vegetation cover to enable the soil surface to be examined for evidence of additional cultural heritage sites before quarry development occurs. This may be undertaken progressively, in the context of the proposed staged development of the quarry extension.

I note that prior to sub-surface investigation only a single artefact had been found within the proposed extension area. The most significant scatter found to date is centred on an area that has been ploughed and cropped. Therefore a surface inspection, even with all vegetation removed, might still not be an adequate means of determining whether other sites could occur. It is my assessment that provision should be made for some form of sub-surface sampling of other areas where there is circumstantial evidence of cultural heritage prospectivity (eg soil type, topography, presence of resources used by Indigenous people).

No significant non-Aboriginal cultural heritage features will be affected by the proposed quarry extension.

3.3.9 To avoid significantly increased risk to the stability of slopes external to the proposed extended quarry.

The eastern flank of the Toomuc Valley below the existing quarry features a number of slow-moving landslip features. The EES investigated the potential for the proposed extension of the quarry to increase the risk of destabilising the landslips. The Panel has concluded that the landslips are highly unlikely to be affected by blasting, and are probably more vulnerable to the effects of waterlogging. Effective planting in the vicinity of the landslip features should provide for more stable soil moisture conditions and more than compensate for any potential impacts arising from the slightly closer proximity of blasting as the quarry is extended westwards.

I note that some of the proposed planting is to be located outside the area of the Work Authority and will not be included in the Work Plan. It is preferable that the planning permit

and the Work Authority should apply to the same area of land. At the same time it is highly desirable that all the proponent's commitments should be reflected through statutory approvals to provide reassurance to the community that those commitments will be fulfilled, especially in the event of a change of management of the quarry. It is therefore my assessment that the proponent should enter into an agreement under section 173 of the P&E Act requiring the completion and maintenance of landscape and landslip stabilisation planting on land outside the land directly controlled under the planning permit, generally in accordance with the proposed planting described in the EES.

3.3.10 To establish the basis for an environmentally, economically and socially acceptable rehabilitation plan and end use for the project area, with particular attention to the long-term stability of the constructed internal landform.

The end use of the quarry site has not been determined in detail, but Readymix's rehabilitation proposal provides for stabilised internal slopes, revegetation and drainage. The site could accommodate a range of pastoral or other non-intensive agricultural uses. As the quarry would continue to operate for more than twenty years if the proposed extension proceeds, it is not appropriate at this time to seek to determine the end use of the site in detail. I note that the Panel has not expressed concerns about the practicability or efficacy of the proposed rehabilitation of the quarry site. It is my assessment that the rehabilitation proposal described in the EES is appropriate and should be reflected in the approvals for the proposal.

3.3.11 To achieve a net community benefit with respect to overall social, economic and ecological outcomes.

Having considered the range of potential impacts that the Mt Shamrock Quarry extension proposal could cause, and the practicability of mitigating those impacts, the Panel concluded that the proposal could be allowed to proceed, subject to appropriate conditions, without unacceptable impacts on the environment. It should be noted that the impact of the proposal on Indigenous cultural heritage values represented by the artefacts scatters and isolated artefacts known to occur on the site has not been evaluated by the Panel or in this Assessment.

There are benefits to the broader community if the proposal proceeds, in terms of access to lower-priced quarry products in the supply area served most competitively by the Mt Shamrock Quarry. Everyone benefits to some extent because we are all users of roads, buildings and other infrastructure that rely for their construction and maintenance on quality crushed rock products. The presence of the South Eastern Growth Area in close proximity to the quarry will contribute to the increasing population of the quarry's neighbourhood over the period that the extension is projected to operate. The quarry also provides economic benefits through direct and indirect employment and flow-on economic activity.

While the community benefits of such projects are commonly shared at a modest level among the broader population, the adverse impacts may be restricted to the immediate neighbourhood of the operation, where they are experienced by a small number of people who may feel those impacts quite keenly. In determining net community benefit it is important to ensure that the local adverse impacts are able to be adequately managed and mitigated. It is my assessment that the range of mitigation measures that have been identified through the EES process will enable appropriate environmental performance standards to be met in the immediate neighbourhood of the extended quarry.

It is my assessment that, overall, the impacts of the proposed extension of the Mt Shamrock Quarry will be positive, and therefore, that this development should be approved.

4 RESPONSE TO PANEL RECOMMENDATIONS

The Panel has framed its recommendations in terms of the conditions of the planning permit, work authority and work plan to which the proposal will be subject if it is to proceed. Rather than repeating all the Panel's proposed conditions here, it may be accepted that this Assessment supports all the Panel's recommendations except where otherwise provided below.

The Panel's recommendations are given in *italics* and the Minister's assessment response follows in normal font.

4.1 Panel Recommendations – Planning permit

I note the Panel's general recommendations that the permit should be *reviewed for consistency with the model permit conditions set out in the document* Writing Planning Permits *(DSE and MAV, June 2003)* [and] *reviewed for consistency with Plain English principles*. In that context, and in addition to the detailed comments that follow, it is my assessment that a range of minor or editorial changes, which do not change the intent of the recommended conditions, should be made to the conditions recommended by the Panel.

4.1.1 Endorsed plans

The Panel has recommended that:

The endorsed plans attached to the planning permit should include "A simple cadastral plan showing the boundaries of the existing and proposed Work Authority and extraction limit [and] *a plan showing each of the four extraction stages.*

Minister's response

Given the requirement for the latter plan, to which I would add the words "generally in accordance with the staging described in the EES", I do not consider it necessary for the former plan to show more than the boundary of the extended Work Authority area. It is my assessment that this approach will result in clearer simpler plans, while still ensuring that approval is limited to the proposal that has been assessed through the EES process.

4.1.2 Cultural heritage

Minister's response

This issue is discussed in section 3.3.8 of this Assessment. In addition to the conditions recommended by the Panel, it is my assessment that additional conditions are required to ensure:

- the appropriate investigation of stripped areas that may prove reasonably prospective for cultural heritage, including sub-surface investigation if necessary; and
- the appropriate scientific investigation of known Aboriginal cultural heritage sites within the extension area, prior to their destruction in the course of approved quarrying.

I note that the power to give Consent to disturb indigenous cultural heritage sites, delegated in this case to the Wurundjeri Council, derives from Commonwealth legislation. Therefore, I consider it appropriate that the Wurundjeri Council should decide whether and uder what conditions to grant Consent before I determine the planning permit application for the proposal.

4.1.3 Noise

The Panel has recommended that the planning permit should require:

a) Noise Limits at sensitive sites should be set according to the provisions of the Interim Guidelines for Control of Noise in Country Victoria (N3/89)

b) The background noise level for the purpose of determining noise limits will be assumed to be an L_{90} of 31 dB(A) unless further information is provided from which the EPA determines that a more appropriate background noise level should be used in determining noise limit(s).

Minister's response

As noted in section 3.3.2, it is my assessment that a daytime noise limit for 45dB(A) should be prescribed in the planning permit. If subsequent measurements lead to the derivation of a higher background noise level, resulting in the calculation of a higher daytime noise limit for the quarry, measured in accordance with the provisions of SEPP N-1, consideration may be given at that time to amending the permit accordingly. However, I believe it is in the best interests of certainty for all concerned that a clear performance standard should be prescribed in the planning permit.

4.1.4 Environmental Review Committee (ERC)

ERCs are commonly established for substantial mining and quarrying operations. They provide a project-specific forum for information sharing and for discussion of environmental issues arising from the operation, resolution of problems and impending changes to the operation or the statutory context. The Panel has made highly detailed recommendations about the establishment and procedures for an ERC for the Mt Shamrock Quarry, and has recommended that those provisions be included in the planning permit.

The Panel has also specifically recommended that provision should be made for the appointment of an independent Chairperson to chair the ERC. Subsequently the Panel has recommended that: *The administrative costs of the ERC shall be borne by the quarry operator. Each member of the ERC shall bear their own costs of participation.*

Minister's response

It is my assessment that the permit conditions should be restricted to those matters which the permit holder can be reasonably expected to carry out or comply with. Matters for which other parties should take responsibility (such as Council or the Department of Primary Industries) should not be prescribed in planning permit conditions. However, I support the establishment of an ERC to provide a structured liaison forum for the Mt Shamrock Quarry, given its likely lifespan if the proposed extension proceeds and the range of issues that have emerged through the EES process. I agree in general terms with the representation, procedures and other matters covered in the Panel's recommendations about the ERC.

Therefore it is my assessment that Cardinia Shire Council and the Department of Primary Industries (in terms of establishing the ERC) and other stakeholders (in terms of participating in the ERC) should have regard to the Panel's recommended provisions, included in Appendix 3 of this Assessment. It is my assessment that provisions for which the proponent should be directly responsible (such as participation in the ERC, and meeting the costs and secretariat requirements of the ERC) should be prescribed in permit conditions.

It is my assessment that the professional fees of the independent Chairperson should be explicitly identified as a component of the administrative costs of the ERC, and that each member of the ERC other than the independent Chairperson should bear his or her costs of participation.

4.1.5 Environmental Management Plan (EMP)

The Panel has made a range of recommendations about matters to be addressed or included in the EMP. It has recommended that *the* [single] *EMP include all the environmental management ... requirements of not only the EIDA* [*Extractive Industries Development Act* 1995] *and regulations but also the requirements of the Responsible Authority in regard to implementation of the Cardinia planning scheme, State Environment Protection Policies, the requirements of the EPA Licence DW903 and Net Gain requirements* (p. 163).

Minister's response

I note that the Panel's discussion of the contents of the EMP focuses heavily on the need for a more rigorous approach to complaints management. This issue is clearly important, especially in the context of the strained relationships that appear to exist between the quarry and some of its neighbours. However, the coverage of any single EMP for the quarry operation must be comprehensive, which might require inclusion of issues and activities that may lie beyond the usual jurisdictional expertise of any single authority.

The scope of the EMP is important because the endorsement of the EMP should be unequivocal, and not dependent on elements of the document being separately to the satisfaction of different agencies. It is my assessment that preparation and implementation of an EMP to the satisfaction of the responsible authority, in consultation with DPI and other relevant authorities, should be a conditional requirement of the planning permit. The possibility that the same EMP may also have been (or might subsequently be) approved by DPI for the purposes of the Work Plan is immaterial. In this regard I have taken into account the relatively broader access to enforcement procedures that the P&E Act provides, and the role of the planning permit as the principal approval (which follows a process involving formal third party input) for an extractive industry proposal. I am also mindful that those elements of the EMP most likely to be of interest or concern to the community will probably be those dealing with issues controlled through planning permit conditions rather than through Work Authority or Work Plan conditions.

It is most important for effective regulation and for transparency that the regulatory authorities, especially Cardinia Shire Council (in its capacity as responsible authority for the purposes of administration of the planning permit) and DPI, should work closely and co-operatively together to ensure that the interests of all parties are appropriately protected through the administration of the approvals for the quarry operation.

4.1.6 Section 173 Agreement

The Panel has not recommended any requirement for an agreement under section 173 of the P&E Act. Such a requirement was included in the draft planning permit conditions discussed during the informal forum on conditions that the Panel conducted on the final day of its hearing, in the context of cancellation of previously issued current planning permits.

Minister's response

While I concur that an agreement is not necessary to require the permit holder to initiate cancellation of existing permits, a section 173 agreement would be an appropriate mechanism for ensuring the permanent identification and protection of the designated native vegetation offset area. An agreement could also provide for the completion and appropriate maintenance of plantings to be undertaken by Readymix outside the area controlled by the Work Authority and the planning permit, for instance plantings associated with stabilisation of landslips. These issues are discussed under sections 3.3.4 and 3.3.9 above, respectively. It is my assessment that the planning permit should require the holder to enter into an agreement under section 173 of the P&E Act to provide for those matters.

4.2 Panel Recommendations – Work Plan

The Panel has made a number of detailed recommendations with respect to the Work Plan variation that must be approved for the proposed extension to proceed. While the Panel was not directly empowered under the EID Act, those recommendations are germane to this Assessment. The Panel's recommendations with regard to the Work Plan may be regarded as supported by this Assessment, with the following specific qualifications.

4.2.1 Noise monitoring

With respect to measurement and assessment of noise levels, the Panel has recommended:

> *Measurement and assessment of noise levels commencing at all monitoring locations whenever a change in activities at the quarry could reasonably be expected to result in a change in noise levels at sensitive receptors and continuing on a daily basis until consistent compliance has been demonstrated.*

Minister's response

While such monitoring is supported, it will also be necessary to ensure and demonstrate that noise from routine operations continues to comply with the specified limit. In this regard it should be noted that factors external to operations at the quarry, such as local meteorological conditions, can significantly affect noise propagation. Therefore, it is my assessment that routine noise monitoring should also be specified in the Work Plan at intervals no less than fortnightly throughout all periods between operational changes as mentioned in the Panel's recommendation above.

4.2.2 Dust control

Minister's response

The Panel's recommendation contains an extensive list of dust control measures that it recommends "must" be included in the Work Plan variation. While most if not all of the listed measures may be appropriate and efficacious, it is my assessment that under a performance-based approach the proponent should have discretion to determine what measures will be taken to achieve the specified performance standard. The list should be regarded as indicative but not exhaustive, and the onus must remain on the proponent not merely to institute a prescribed list of mitigation measures but to ensure and demonstrate that performance standards are consistently met.

4.2.3 Data collection and management

Minister's response

The Panel has recommended highly detailed procedures for selection and appointment of suitably qualified experts to certify written procedures for collection and management of environmental data and for certification of personnel involved in implementing those procedures. The procedures recommended by the Panel may be most appropriate, but there may be potential for the procedures to be modified or improved to provide a comparable or better outcome. In particular, there may be alternatives to conferring executive powers on the ERC or the ERC Chairperson. It is my assessment that the DPI should consider the Panel's recommendations and use them for guidance in determining the most appropriate measures for addressing the issue.

4.3 Panel Recommendations – Work Authority

4.3.1 Quantity of stone sold

The Panel has recommended that:

Any Variation to Work Authority 174 granted must require that:

a) The quantity of stone sold will not exceed 1,200,000 tonnes in any 12 month period unless a Variation to the Work Plan detailing the actions required to produce the increase in production rate necessary to enable such sales has been applied for and approved.

b) Any application for a Variation to the Work Plan in which sales of in excess of 1,200,000 tonnes of stone per annum is enabled will be referred to the Responsible Authority, the EPA and the ERC.

c) An application for a Variation to the Work Plan in which sales of in excess of 1,200,000 tonnes of stone per annum is enabled will not be approved unless:

i. The Responsible Authority is satisfied that the conduct of the work described in the Variation will not result in breach of the conditions of the Planning Permit in place at the time.

ii. The EPA is satisfied that the conduct of the work described in the Variation will not result in breech of the conditions of the Planning Permit relating to noise and air quality in place at the time.

Minister's response

The Panel's recommendation reflects the concern of some submitters that some amenity-related impacts of the quarry are likely to increase proportionally with production volumes, although it has acknowledged that other impacts are unlikely to change perceptibly proportionate to production. I have concerns about the Panel's recommendation, for the following reasons:

- The impacts that might increase proportionately with production volumes (such as truck traffic) may be amenable to more direct controls if necessary – eg a requirement for an additional contribution to road upgrades or intersection treatments.
- Many impacts have no proportional relationship to production volumes of crushed rock.
- Some material other than crushed rock may be sold from time to time (eg overburden), so that a fixed volume of sales might involve variable quantities of crushed rock. However, production of other such material might not involve many of the impacts associated with crushed rock production.

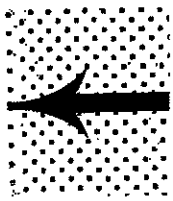
- Regulation of sales volumes would be inconsistent with the performance-based approach adopted generally for framing approvals conditions as a matter of current practice, and utilised in most cases by this Panel.
- Regulation of sales volumes without a clear and direct relationship between sales volumes and off-site impacts to warrant the use of sales volumes as a surrogate for impacts could be regarded as an unjustified and challengeable restraint of trade.

I note that any substantial increase in sales volume beyond the recent historical sales recorded by the quarry (which vary from year to year) would most likely require changes to production infrastructure that in themselves could require variations to the Work Plan or Work Authority. For instance, replacement of crushers with higher volume crushers, or reconfiguring stockpile layouts to enable substantially greater volumes to be loaded, weighed and dispatched might not be consistent with the systems designated in the current proposed Variation to the Work Plan.

It should also be noted that the operator's obligation to comply with planning permit conditions is fixed and unequivocal, regardless of production rates or sales volumes.

It is my assessment that DPI should adopt a cautious approach in determining whether proposed upgrades or other changes to production infrastructure require formal variation of the Work Plan. In that regard DPI should have regard to views expressed through the ERC about the potential impact implications of the proposed change, and should ensure that, where it is determined that a Variation to the Work Plan is required, appropriate formal referral to other authorities takes place. It is my assessment that a condition requiring a Variation to the Work Plan or to the Work Authority (or indeed an amendment to the planning permit) solely on the grounds of a change in production volume should not be applied.

ROB HULLS MP
Minister for Planning



APPENDIX 1

LIST OF ACRONYMS

AAV	Aboriginal Affairs Victoria
AHD	Above height datum (effectively above sea level)
DB(A)	Decibels (A weighted) (reflecting human range of hearing)
DB(L)	Decibels (linear) (measure of airblast)
DPI	Department of Primary Industries
DSE	Department of Sustainability & Environment
EE Act	*Environment Effects Act 1978*
EES	Environment Effects Statement
EID Act	*Extractive Industries Development Act 1990*
EMP	Environmental Management Plan
EPA	Environment Protection Authority
EP Act	*Environment Protection Act 1970*
EPBC Act	*Environment Protection & Biodiversity Conservation Act 1999*
ERC	Environmental Review Committee
ESO	Environmental Significance Overlay
EVC	Ecological Vegetation Classes
LPPF	Local Planning Policy Framework
M2030	*Melbourne 2030* (Metropolitan Strategy)
mm/sec	millimetres per second (measure of ground vibration)
MSS	Municipal Strategic Statement
P&E Act	*Planning and Environment Act 1987*
PM10	Airborne particles with an effective diameter of 10 microns or less
RCS	Respirable crystalline silica
SEPP	State Environment Protection Policy

SPPF	State Planning Policy Framework
TCG	Technical Contact Group
UGB	Urban Growth Boundary
VCAT	Victorian Civil & Administrative Tribunal

APPENDIX 2: Locality Plan

APPENDIX 3

RECOMMENDED ARRANGEMENTS FOR ENVIRONMENTAL REVIEW COMMITTEE (ERC)

The Panel included detailed conditions for the establishment and administration of the ERC in its recommended planning permit conditions for the quarry extension proposal. However, most of those provisions lie outside the jurisdiction or control of the permit holder, and therefore are not appropriate for inclusion as permit conditions. They are reproduced here (with minor modifications in line with recommendations in the body of the Assessment) for the guidance, in particular, of Cardinia Shire Council and DPI, which should work together to lead the establishment of the ERC. They also provide useful context for the other stakeholders that should be invited to nominate representatives to sit on the ERC.

Those matters that should be binding on the permit holder are to be addressed explicitly in planning permit conditions.

1. An Environment Review Committee (ERC) must be formed within 3 months of the cancellation of permits under condition 2. The role of the ERC is to include the following:
   (a) review of the environmental performance of the operator of the Mt Shamrock quarry against the requirements of relevant legislation, this planning permit, WA 174 and the EMP;
   (b) review of work plans and work plan variations;
   (c) provision of advice on the means of minimising impacts, expediting approvals and the views of the community; and
   (d) facilitation of community understanding of quarrying and government regulation of the activity.
2. Representatives of the following bodies shall be invited to be members of the ERC and the ERC shall be comprised of representatives (the number of which is shown in brackets) of those bodies who accept the invitation:
   (a) The Shire of Cardinia (1)
   (b) The Department of Primary Industries (2)
   (c) The Environment Protection Authority (1)
   (d) The Department of Sustainability and Environment (1)
   (e) The Department of Human Services (1)
   (f) Southern Rural Water (1)
   (g) The quarry operator (2)
   (h) The Wurundjeri Tribe Land Compensation and Cultural Heritage Council Inc. (1)
   (i) The Bunurong Aboriginal Land Council (1)
   (j) The local community (2)
   (k) Any other agency representative or stakeholder invited by agreement of the ERC
3. The community representatives of the ERC will be appointed by the following procedure:

(a) The Responsible Authority will publish an invitation to nominate for a position of community representative on the ERC in the local newspaper and receive nominations. All those nominated will be required to attend a seminar conducted jointly by the Responsible Authority and the Department of Primary Industries on the role, function and operation of the ERC. Within seven days of the completion of that seminar the Responsible Authority will appoint the required number of community representatives to the ERC from the seminar participants.

(b) Each community representative will be appointed for a term of 2 years and at the expiration of that term the Responsible Authority may reappoint the community representative for a further two year term or utilise the process in (a) to appoint a community representative. The retiring community representative may renominate.

(c) Each community representative will nominate an alternate representative who can act in their place as required.

4. Prior to the first meeting of the ERC, the Responsible Authority and the Department of Primary Industries will jointly identify at least three candidates for the position of ERC Chair. Such candidates will be independent of the Shire of Cardinia and the Department of Primary Industries and will not include officers of the Department of Sustainability and Environment who have been involved in the management of the EES process for the Mt Shamrock Quarry Extension.

5. At the first meeting of the ERC, which will be chaired by a representative of the Responsible Authority, the ERC will select a chairperson from the candidates nominated by the Responsible Authority and the Department of Primary Industries. The person selected will act as chairperson for the following 12 months. At the meeting immediately prior to the expiration of the chairperson's term the ERC will either reappoint the incumbent chairperson or use the process described in condition 33 to select and appoint a new independent chairperson or invite the Responsible Authority or the Department of Primary Industries to provide a chairperson.

6. The ERC must meet at least twice per year.

7. The ERC may convene specialist sub-committees from time to time to consider particular issues and report back to the ERC.

8. Other parties or agencies may be invited by the ERC Chair to participate from time to time, in particular specialist staff from the Department of Primary Industries, the Environment Protection Authority and the Department of Sustainability and Environment.

9. The administrative costs of the ERC, including the fees of the Chairperson, must be borne by the quarry operator. The quarry operator must provide secretariat services for the ERC to the satisfaction of the responsible authority. Each member of the ERC other than the Chairperson will bear their own costs of participation.

DEPARTMENT OF
NATURAL RESOURCES AND ENVIRONMENT

ENVIRONMENTAL GUIDELINES

ENVIRONMENT REVIEW COMMITTEES FOR MINING AND EXTRACTIVE INDUSTRIES

Minerals & Petroleum Victoria – 2001

State Government Victoria
Department of Natural Resources and Environment

Victoria The Place To Be

GUIDELINES FOR ENVIRONMENT REVIEW COMMITTEES FOR MINING AND EXTRACTIVE INDUSTRIES

Department of Natural Resources and Environment

1. INTRODUCTION

An Environment Review Committee (ERC) is a review body created by the Department of Natural Resources and Environment (NRE) as a condition of operation for selected mines and extractive industry sites. It's primary function is to review the operator's environmental performance and enhance communication between industry, government agencies and the community.

ERCs have been in use at a number of Victorian mining and extractive industry (quarry) operations since the late 1980's. Since that time, the scope of the ERC's interests has grown from a focus on purely environmental matters to other matters of relevance to the community. As a result the ability of ERCs to act as effective bodies for review and communication has also grown.

2. THE NEED FOR A COMMITTEE

It was never the intention that all sites should have an ERC, and they have been required at only a small proportion of mines and extractive sites. This reflects an assessment of the reasonable probability of significant impacts and the need to make best use of NRE staff time. This assessment, made by NRE during the approvals process, is risk based and draws on the project's size, longevity, proximity to sensitive environmental or community locales and the probability of adverse impacts. Projects, which have been the subject of an Environment Effects Statement, are likely to require an ERC. Sites required to have an ERC would normally also be required to submit an Environmental Management Programme (EMP). The EMP details measures for protection of the environment and monitoring and reporting of environmental effects.

3. SCOPE OF COMMITTEE RESPONSIBILITIES

The role of the ERC is one of consultation, not consent. An ERC cannot approve a Work Plan, agree to variation of an EES (see section 5.2) or discharge any other legislated authority. Recommendations from the ERC can assist the regulator in the assessment of proposed changes to the operation and can influence the licensee in its management of the operation. However, the ERC and it's members are not legally liable for any actions of the company or a Government agency.

ERCs should confine their review to those areas and activities under the control or direct responsibility of the company and within the mining licence or work authority area. This aside, it is normal practice for the committee to deal with monitoring stations or local

scale and frequency of reporting varies from site to site, but commonly includes results of monitoring for noise, dustfall, respirable dust, blasting, surface and groundwater quality and progress of rehabilitation works. Compliance with established conditions of operation, statutory limits or guidelines is a critical part of the review. NRE, EPA, local water authorities and other government agencies are expected to provide expert comment and answer questions from the community within their areas of responsibility. Reportable breaches of any parameter would normally be reported directly to either EPA or DNRE as and when they occur, hence the committee may review regulatory actions but would not instigate them.

The data collected through EMP monitoring should be held at the offices of the Company for future reference by the members of the review committee and/or the Regional Inspector. Companies are also encouraged to produce an annual report on environmental performance for presentation to the committee and wider community.

5.2 THE ERC AND POST-EES CHANGES TO A PROJECT

In 1996, the Department of Infrastructure (DoI) and DNRE jointly published "Guidelines for preparing Environment Effects Statements for mining projects". Section 1.9 of the guidelines refers to the mechanism by which a project, earlier approved via an EES, could gain approval for changes to works not covered in the original EES. Committee members for projects where an EES has been prepared should be briefed on the processes set out in the guidelines and copies of the guideline should be made available. An ERC may be involved in discussions on which of the alternative approval processes are most appropriate for proposed works. However, the decision on whether and to what extent further assessment or public consultation is required rests solely with the Minister for Planning.

6. OPERATION OF THE COMMITTEE

6.1 CONDUCT OF MEETINGS

Meetings of the ERC should be held at least twice annually. The location and time of meetings should be determined by the chair taking into account the need to minimise impacts on time and resources for the licensee and to allow for the legitimate needs of community representatives with work or care obligations.

In any procedural matters requiring a decision the intention of the committee can be determined by the chair on the basis of a simple majority of committee members. The Chair may exercise a casting vote if necessary. In the case of a dispute or disagreement the Chair should determine the matter.

6.2 COMPANY REPORTING

The licensee is expected to report to the committee at meetings. The report should outline company activities sufficiently to keep committee members up to date with project developments and should provide information on the environmental management and monitoring programs for the site in a format which enables the committee to assess the company's performance. The content of the report may be prescribed by licence conditions or commitments made in the EMP or in the absence of such requirements may be decided by agreement with the ERC.

The licence conditions (see Appendix 1) may limit the term of community representatives, although such terms are usually renewable.

6.7 KEY FEATURES OF A SUCCESSFUL COMMITTEE

There are many factors that make for a successful committee. Commitment from all participants to contribute in an open and orderly manner with due respect to others is essential. A review committee is not a forum for political debate, for groups opposed to the project or persons with a particular cause. Members must accept that the operator has the authority to carry out mining or extraction and should then be prepared to contribute constructively to achieve the best result for the company, the environment and the community.

Other factors that make for a successful committee are:

- stable membership with representatives familiar with the operation and able to speak authoritatively on behalf of their organisations;
- a fair and trusted chair who keeps control of the meeting and keeps it focussed;
- community representatives able to keep personal interests at bay;
- adequate notice of meetings and distribution of minutes to members and local community centres;
- consideration of the need to accommodate observers at committee meetings;
- an agreed company reporting framework and format;
- full and open follow-up by both government and company representatives on any unresolved issue within a nominated timeframe;
- the ability to call in temporary members to address specific issues eg. DHS or the local Aboriginal representative;
- clear and open nomination and selection of community representatives;
- well understood compliance levels presented in tandem with monitoring results;
- (technical) sub-committees used as and when required;
- familiarity by Committee members with the operation (regular site inspections can assist);
- the frequency of meetings set by general agreement of the committee but not normally less than twice per year. At the start of the project more frequent meetings are normal; and
- appropriate timing of meetings where possible to facilitate attendance by community representatives with work or care obligations.

⌘⌘⌘⌘⌘⌘⌘⌘

2.5. Results of environmental monitoring conducted under the EMP shall be regularly reported to the ERC in a format agreed to by the Committee to enable it to assess environmental performance.

2.6. The ERC may, from time to time, consider variations to the Workplan, EMP and conditions where appropriate and make recommendations to DNRE with regard to approvals.

Appendix 13

Quarry Rehabilitation Report

Pakenham Quarry Revised Rehabilitation Staging Plan

Purpose

The purpose of this Quarry Rehabilitation Report is to provide advice on Quarry Rehabilitation activities. This report also aims to clearly define technical terms and to provide an estimation of Quarry Rehabilitation (including Reclamation and Revegetation) for the Pakenham Quarry. Holcim has used its best endeavours to clearly communicate these actions for the benefit of common understanding at the Environmental Review Committee (ERC).

It is important to note that the extraction operation, and therefore the access to overburden material from stripping programs, depends entirely on market conditions which are variable. The information contained herein is referencing current market conditions and may be subject to change.

This report focuses on the 2014 'Rehab Compliance Plan'. These plans were developed to show the planned planting, reclamation and rehabilitation staging to move the quarry operations into compliance with the Approved Schematic Development Plans (ERM. 2005).

Definitions

'Terminal Face': The final point where extraction finishes. This is usually quite a vertical slope/drop which is also known as a pit wall face.

'Quarry Rehabilitation': The process of Reclamation and Revegetation of an extraction area. Quarry Rehabilitation is approved under a Work Plan.

'Reclamation': The process of placement of material (usually unsaleable material or overburden) against a Terminal Face to achieve a rehabilitation batter/slope. Reclamation occurs in stages whereby material is placed, it is then driven over with heavy machinery and compacted, then adding or tipping more material on top, and repeating. Depending on the height of the Terminal Face and the site layout, it may be necessary to build up a reclamation area and then drive across one portion of a reclaimed area to undertake continued reclamation works in future areas.

'Overburden': The layers of earthen material underneath the topsoil layer, but above the hard rock resource. Overburden depth can vary across a site.

'Revegetation': The process of establishing vegetative growth on the reclaimed batter/slope.

'Rehab Compliance Plan (2014)': The plans included in this document (Annexure A).

'Approved Schematic Development Plans (ERM, 2005)': Schematic Stage 1 – 4 Extraction & Rehabilitation Development Plans included in the 2005 approved Work Plan. These plans were originally authored by ERM.

Quarry Rehabilitation

Best practise for Quarry Rehabilitation is that the Quarry Rehabilitation activity occurs progressively i.e. extraction takes place, at market rates, to a Terminal Face and then the Quarry Rehabilitation process follows the extraction (as much as possible pending pit development practicalities). Reclamation and planting programs generally occur as follows:

1. Terminal faces are reached in a stage,
2. Reclamation works occur when the stripping campaign of the future stage occurs,
3. Reclamation works settle for 1 - 2 years,
4. Replanting occurs in autumn following the settlement period.

Notes:

* The entire report is based on estimated market conditions. Extraction and access to overburden from stripping programs depends entirely on market conditions which are variable.

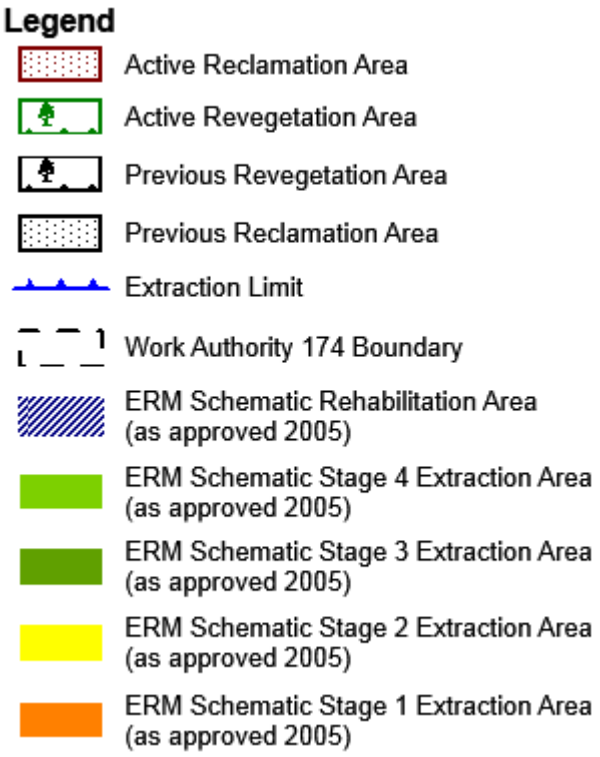
Rehab Compliance Plan 2014 (Annexure A)

The Rehab Compliance Plan (2014) will bring the quarry into compliance with Approved Schematic Development Plans within 18 months (by June 2016). At that point in time, Holcim will have Rehabilitated and Revegetated the north eastern knoll. Annexure A shows that Holcim will be bringing forward the rehabilitation and Revegetated of the south-eastern portion of the pit to also be completed by June 2016. At June 2016 Holcim will be in compliance with the Approved Schematic Development Plans (2005) Stage 1 and will be extracting in Approved Schematic Development Plans (2005) Stage 2.

Annexure B – Future Staging Plan 2014 Stages 2 – 4

The *Approved Schematic Development Plans (ERM,2005)*'show the reclamation areas and also replanting areas for the future 2 – 4 stages of pit development. Annexure B shows how this will occur progressively; distinguishing between Reclamation works and Revegetation works.

The legend (right) is consistently applied across all maps in Annexure B.



Annexure A – Rehab Compliance Plan 2014 (A3)

N

Legend
- Revegetation Areas
- Reclamation Area
- Extraction Limit
- Work Authority 174 Boundary

Holcim

PAKENHAM QUARRY

REHAB COMPLIANCE PLAN 2014

Site Map

Author: LH **Office:** Chatswood, NSW **Date:** November 2014

Aerial Photography: Landair - Apr. 2014 **Digital Mapping:** NA

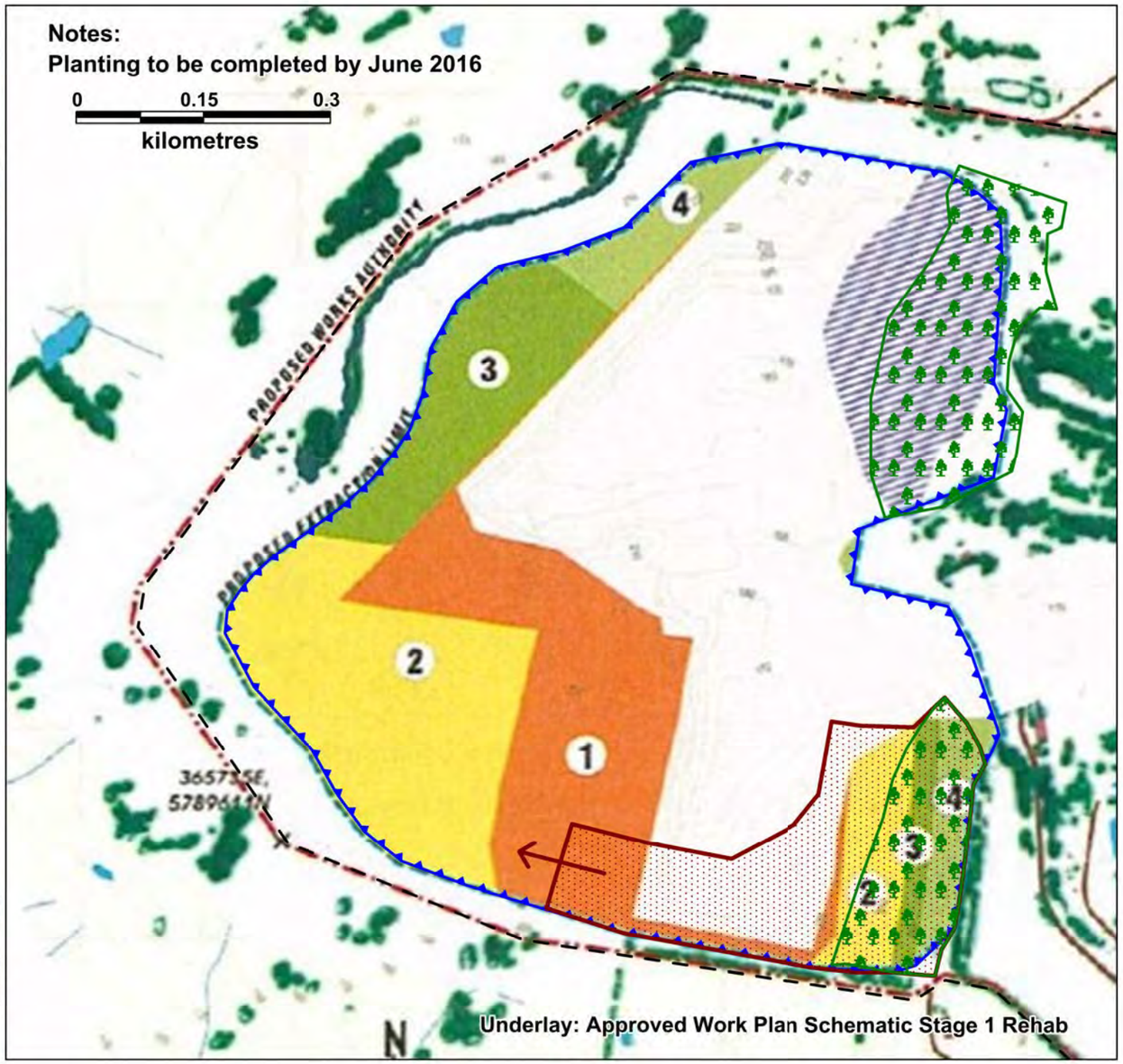
Contour Interval: NA **Grid:** MGA Zone 55 (GDA94) **Vertical Datum:** N/A

Version: 1

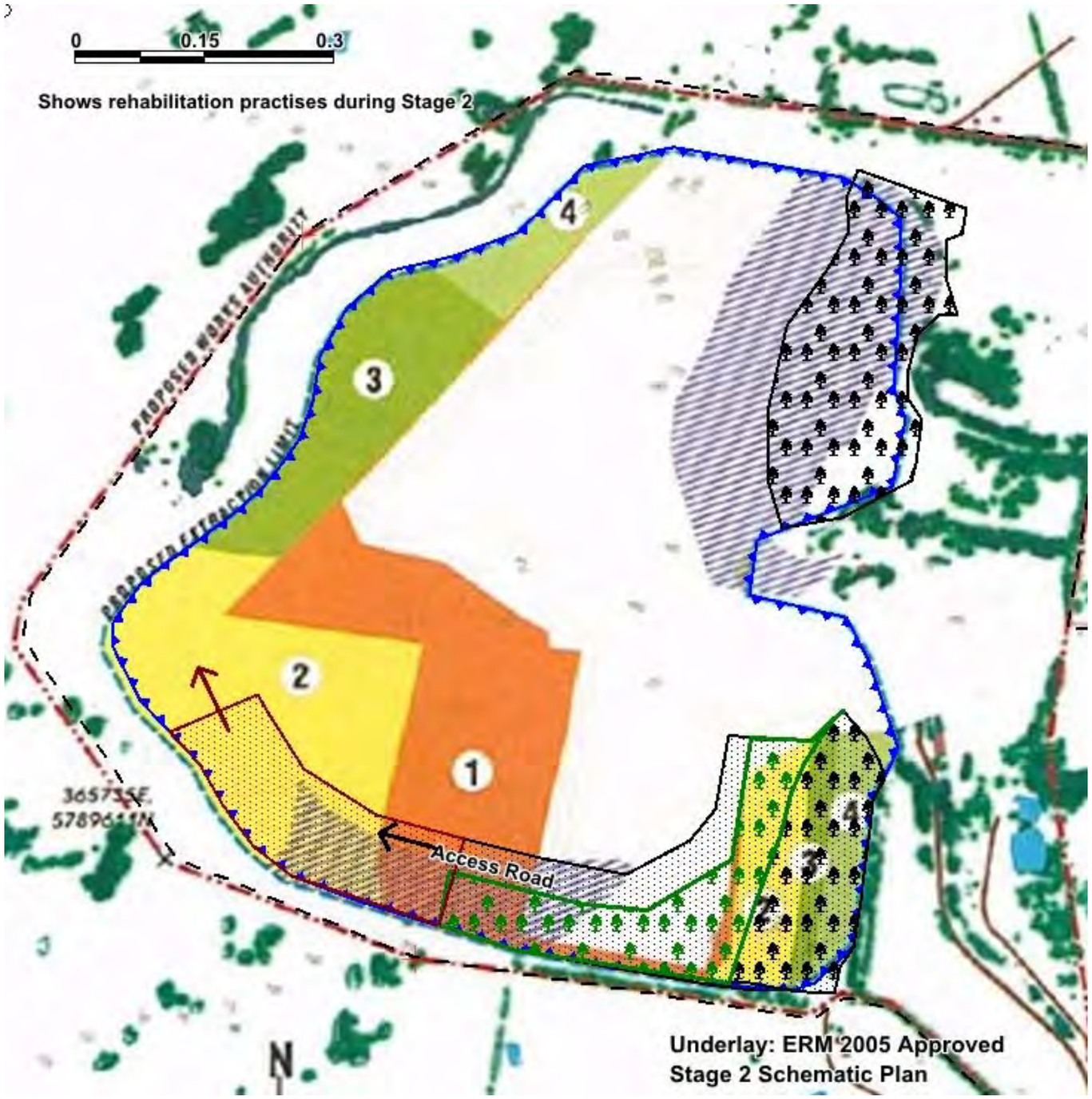
Scale: as shown

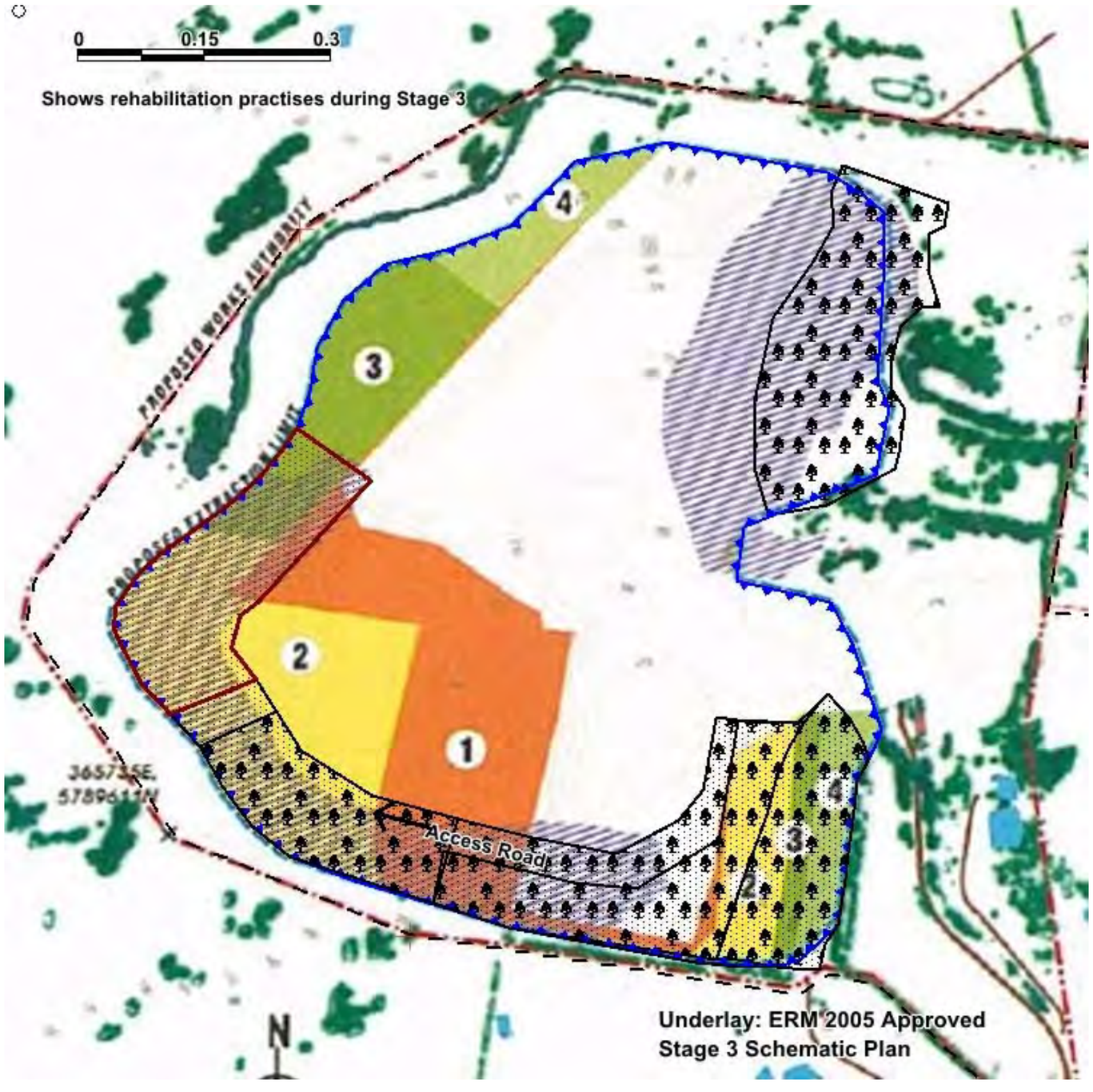
File Path: Y:\AA - GIS\4 VIC Projects\Pakenham\80 Maps

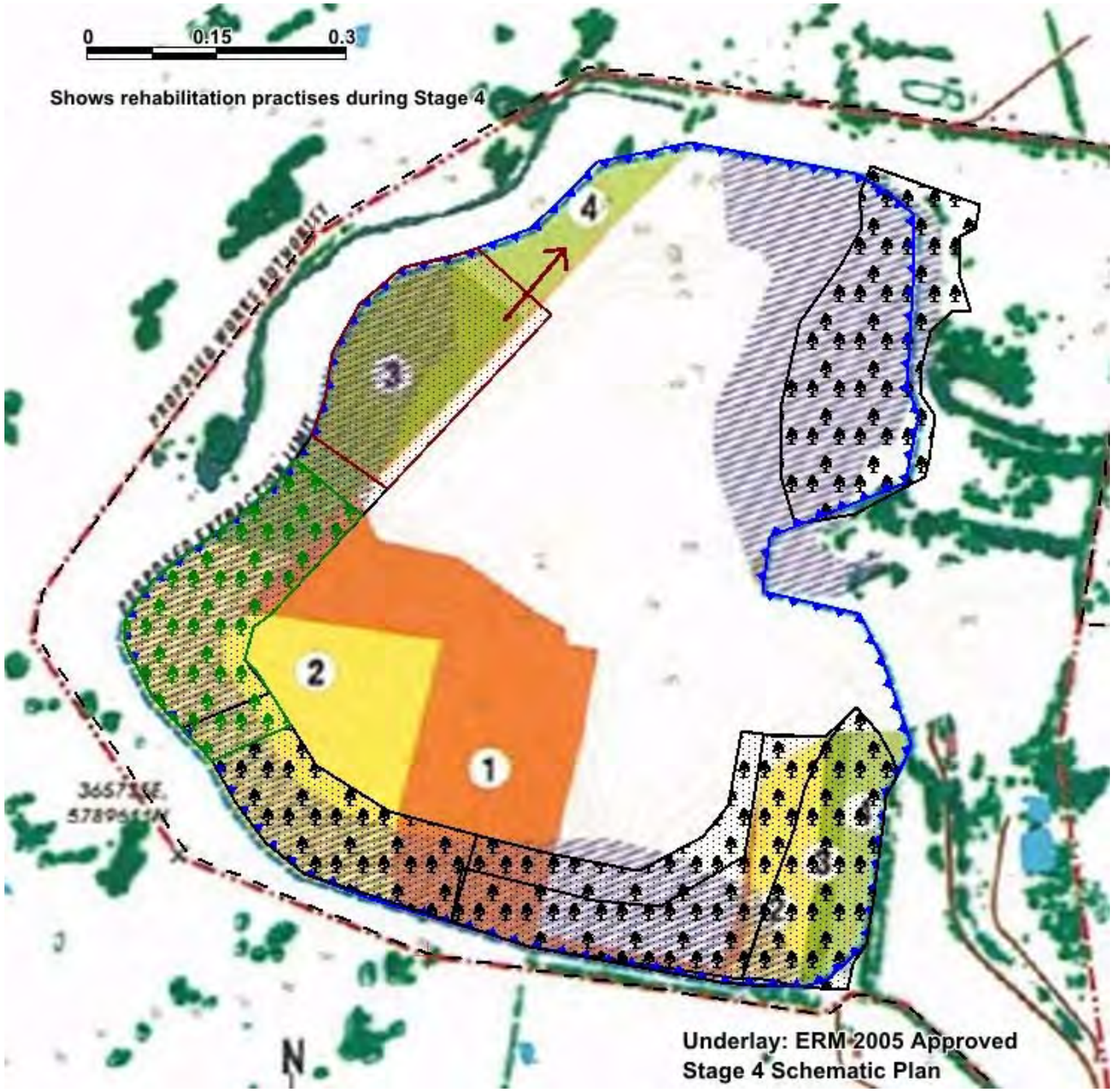
Plan: PAK-1411-01

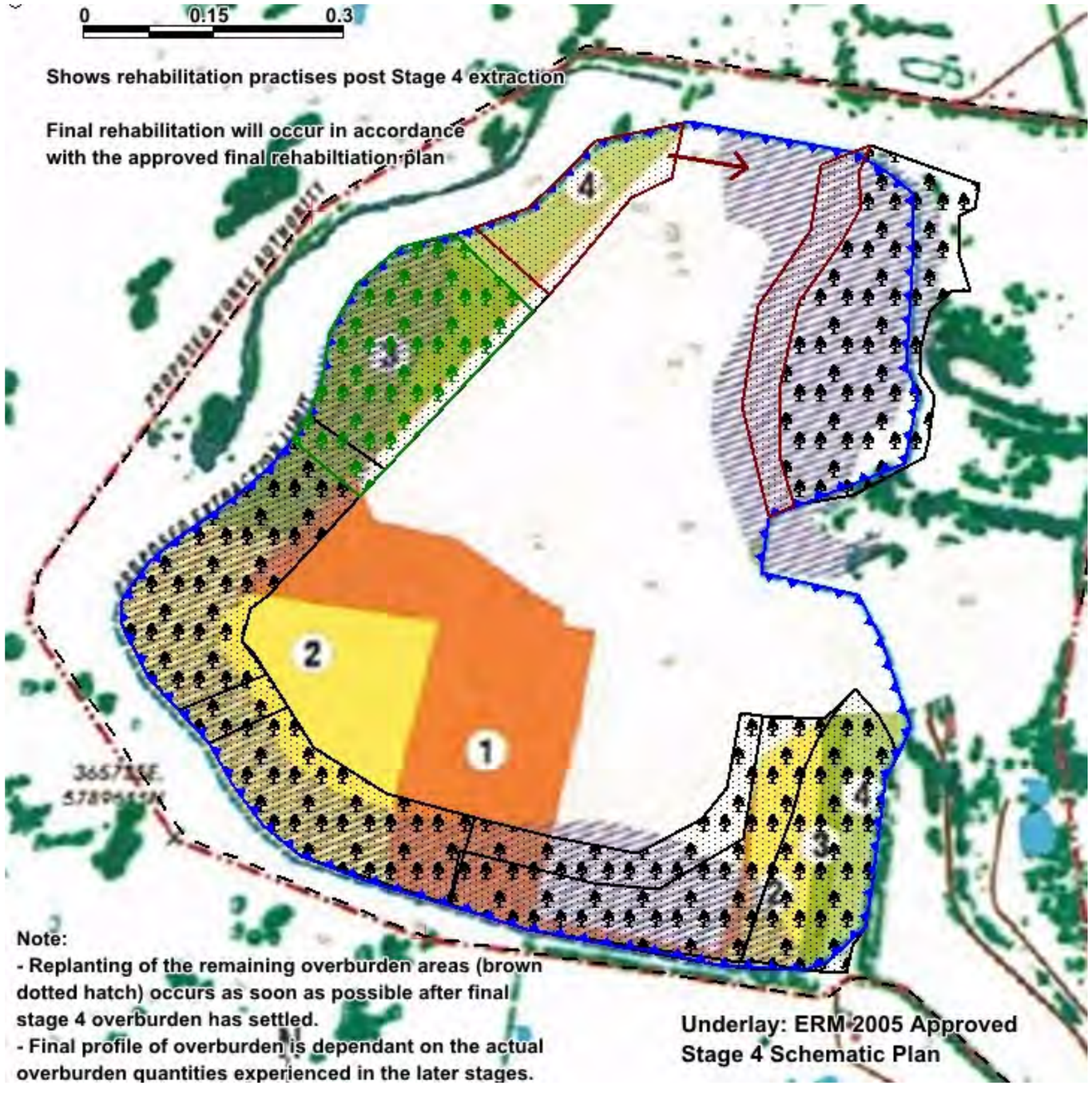


Annexure B – Future Staging Plan 2014 Stages 2 – 4 (includes ERM 2005 approved schematic plan images)

Approved Work Plan Stages	Reclamation Works Commence	Settling of Reclamation Works	Revegetation Planting commencement
Stage 2 (as shown in image directly below)  	Extraction is currently heading into Stage 2 and needs to extend into the south west. Terminal faces need to be established and overburden is placed along the southern boundary. Stage 2 extraction area will be stripped in multiple stripping campaigns. This overburden will be used in the reclamation of the batter along the southern boundary heading in a westerly direction. Reclamation works will follow extraction once terminal faces are achieved.	Settling is expected to take 1- 2 years after reclamation works have been finalised (and there is no further ground disturbance for access purposes). Reclamation works for future stages will require access over a portion of the stage 2 rehab area.	Revegetation commences in the year following the settling period during favourable weather seasons. (Preferably Autumn).

Approved Work Plan Stages	Reclamation Works Commence	Settling of Reclamation Works	Revegetation Planting commencement
Stage 3 (as shown in image directly below) 	Reclamation works will follow extraction once terminal faces are achieved. The reclamation of the batter along the western boundary will continue heading in a north easterly direction, while extraction of Stage 3 continues to occur to a terminal face.	Settling is expected to take 1- 2 years after reclamation works have been finalised (and there is no further ground disturbance for access purposes). Reclamation works for future stages won't require access over southern battered area.	Revegetation commences in the year following the settling period during favourable weather seasons. (Preferably Autumn).

Approved Work Plan Stages	Reclamation Works Commence	Settling of Reclamation Works	Revegetation Planting commencement
Stage 4 (as shown in image directly below) 	Reclamation works will follow extraction once terminal faces are achieved. These will commence from the south and head in a northerly direction.	Settling is expected to take 1- 2 years after reclamation works have been finalised (and there is no further ground disturbance for access purposes). Reclamation works for future stages will require access over a portion of the battered area.	Revegetation commences in the year following the settling period during favourable weather seasons. (Preferably Autumn).

Approved Work Plan Stages	Reclamation Works Commence	Settling of Reclamation Works	Revegetation Planting commencement
Post Stage 4 Extraction (as shown in image directly below) 	Reclamation works will follow extraction once terminal faces are achieved. This will continue in a northerly direction creating a consistent final batter profile around the western edge of the pit. Access from the north will be removed and revegetation of the reclamation areas will then occur. **Reclamation works will be as per the approved Final Rehabilitation Plan.**	Settling is expected to take 1- 2 years after reclamation works have been finalised (and there is no further ground disturbance for access purposes). All heavy moving machinery access tracks to be closed and rehabilitated.	Revegetation commences in the year following the settling period during favourable weather seasons. (Preferably Autumn). **Revegetation works will be as per the Final Rehabilitation Plan.**

Note: Holcim cannot provide dates of finalisation of rehabilitation planting as this is entirely dependent on market conditions. The timeframes would be <u>very distant</u> i.e. some 20+ years away, estimates this far in advance as error prone. This information is also commercially confidential information that is not appropriate for public viewing as it would indicate the life of Holcim's resource and this EMP is a publicly available document.

2.1.3 Dust

2.1.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Monitoring	● A suitable "background" sampling location will be established to determine regional background dust deposition rates.		QM	Complete
	● A weather monitoring station has been installed on site and will be used as part of the sites monitoring program.		PM	Complete

2.2 NOISE

2.2.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Acoustic & other works	● Broadband reversing beepers or similar will be installed and used on heavy earth moving equipment.		QM	Complete
	● The Base of the secondary crusher will be enclosed and access doors kept closed at all times		PM	Complete
	● A sign will be erected and maintained, in a place that is clearly visible to truck drivers leaving the quarry, advising that trucks should avoid using		PM	Complete

	engine brakes on Mt Shamrock Road. (see EMP s.2.7 of EMP).			

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2.4 SURFACE WATER, DRAINAGE, & GROUNDWATER

2.4.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Water Management System (WMS)	• Implement pump and containment systems such that quarry surface water runoff is captured and re-used from Donazzan's Dam to uses around the site. Before water is allowed to flow from Donazzan's Dam to the v-notch discharge point it will be tested to confirm its permissible TDS concentration. This WMS will enable the site to reduce discharge events & any possible TDS breaches.	Water Management System	QM	Completed
	• Agricultural activities will be removed from Donazzan's Dam and the discharge pathway to the V-notch.	-	QM	Completed
	• The following landscape works will be carried out: • Planting around the outside edge of Donazzan's Dam with reeds native to the area.	LRMP; Landscape & Rehabilitation Report	PM	Completed
	• Rock-line the spillway immediately downstream of Donazzan's Dam.		PM	Completed
	• Regrade spillway embankments to encourage plant growth to a slope of 1V:5H or 1V:3H.		PM	Completed
	• Plant native species within the spillway downstream from the outlet at Donazzan's Dam to the receiving waterway.		PM	Completed
	• Plant native species within the spillway upstream from the inlet to Donazzan's Dam from the Quarry.	LRMP; Landscape & Rehabilitation Report	PM	Completed
	• Reinstate riparian vegetation along the waterway upstream and downstream of Donazzan's Dam and undertake planting in terrestrial areas surrounding the waterway.		PM	Completed

2.5 SLOPE STABILITY

2.5.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Natural Slopes (outside Work Authority boundary)	• Planting of deep-rooted trees in landslip areas (i.e. as revealed within EES report Slope Stability, Figure 6, *2001 Aerial Photography Interpretation* and Figure 8 URS 2005) will progressively be undertaken in accordance with the Landscape Plans (ref.. Work Plan Annex B Non-Operational Area - Landscape Plan).	Landscape & Rehabilitation Report	PM	As specified in the s.173 Agreement
	• Surface drainage will be established in the vicinity of the identified landslip prone areas to minimise infiltration of rainfall run-off.	LRMP	-	Completed
	• Areas where surface drainage is known from historical observation to exacerbate landslips, (i.e. Figure 6, *2001 Aerial Photography Interpretation* URS 2005) will be regraded to direct water away from landslip areas.	-	-	Completed

Appendix 14

2.6 GREENHOUSE GAS EMISSIONS

2.6.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
	• Nominate an energy manager within the quarry to ensure that steps are taken to meet energy and GHG reduction targets; and		QM	Completed

2.7 TRAFFIC MANAGEMENT

2.7.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Traffic Flow	• Construction of a left hand turn deceleration lane at the south west approach to the Mt Shamrock Road and Pakenham Road, subject to VicRoads consent.	N/A	QM	Complete
Signage	• A sign to be erected and maintained, and clearly visible to truck drivers leaving the quarry, advising that trucks avoid using engine brakes on Mt Shamrock Road.	(also see preceding reference)	PM	completed

2.7.4 MONITORING

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Construction of left hand turning lane	N/A	QM	6 monthly	Progress status report	complete
	VicRoads approval		At completion of works	N/A	complete

Appendix 14

2.8 NET GAIN MANAGEMENT PLAN

2.8.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Appointment of Offset Site Manager	● A contractor with expertise in revegetating the local indigenous vegetation community will be appointed to manage the re-establishment of indigenous understorey vegetation in the offset areas. ● The contractor will be required to provide further detail on the methods to be used in a detailed works program prior to commencement of works.	-	PM	Complete
Site Identification & Protection	● The offset site (as identified in Figure 2 of the NGOMP) will be fenced in order to clearly delineate the site's extent. ● An appropriate sign will be erected to inform residents/visitors of the site's ecological characteristics, purpose and value.	NGOMP	PM, Offset Site Manager (OSM)	Complete
Plant Propagation	● Plants of local provenance will be propagated, or seeds collected for dispersal as specified in the Appendix to the NGOMP.	-	OSM	Complete
Site Preparation	● The offset site will be prepared over a minimum six (6) month period through: (a) monthly sprays of existing (introduced) vegetation to deplete the weed soil seed bank; (b) cut and paint and/or drill and fill weedy shrubs such as Hawthorn, Briar Rose and Blackberry; (c) installation of a shallow layer of mulch (less than 5 cm deep) to prevent soil loss but not inhibit the germination of weeds.	-	OSM	6 months

Planting	● Appropriate species will be planted/recruited within the offset site. ● Planting / recruitment densities will comply with the minimum revegetation standards provided by DSE (DSE, 2006).	See reference 6 – Part A	OSM	As appropriate to year 10
Plant Maintenance	● Plantings will be maintained over a 10 year period, taking all necessary measures to ensure: (a) survival and growth of the plants, and (b) good appearance or presentation of the plantings.	NGOMP	QM	10 years from EMP approval
Offset Site Management Audit/ Monitoring	● A management audit/monitoring exercise will be undertaken at 1, 2, 5, 7 and 10 years after planting to evaluate performance and thus compliance with the Permit.		OSM	complete
	● Audit/monitoring of the offset site will be conducted by a qualified ecologist.		OSM	-
	● Any additional management actions identified by the audit will be implemented through the ICARE 2.0 system as an audit and inspection event type.		OSM	Complete
Audit Reports	● All audit reports will be forwarded to the ERC for its information.		PM	Complete

2.8.4 MONITORING

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Offset Site Management Audit	-	PM	End of years 1, 2, 5, 7 & 10	DSE, 2004 (reference 7)	Compliance with Permit and DSE Net Gain Guidelines (reference 6)

2.9 CULTURAL HERITAGE

2.9.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
General	• A copy of the Consent (Appendix 14) must be on-site and available for inspection during works associated with this permit.	-	QM	During works

	• Prior to any soil stripping taking place on the site:
	  • all Indigenous stakeholders will be notified; and
	  • any hay will be baled to allow Indigenous stakeholders to survey the cleared land.
	  • ensure that the conditions as specified in the Consent to Disturb dated 17th May, 2007, and 4th September, 2007, are complied with.
		SHE Guideline 4.7 Community Engagement	QM	Complete

	• Upon the discovery of suspected human remains all works must cease. The Wurundjeri Tribe Land Compensation and Cultural Heritage Council Inc. interim Chief Executive Officer, Aboriginal Affairs Victoria, the Victoria Police and the State Coroner's Office must be notified immediately.	Consent to Disturb, Reference 5.	QM	As applicable during works
Controlled Archaeological Excavation -	• Before any ground disturbance there will be controlled hand excavation of 100% of the archaeological deposits at site AAV7921-680 – Shamrock AS1, apart from the "plough	Consent to Disturb. Reference 5.	PM	Complete-

Appendix 14

AAV 7921-680 – Shamrock AS1	zone" (top 15 cm of site) as per the 4th September, 2007 Consent Amendment.			
	• This excavation will be conducted by a qualified archaeologist and involve representative/s from the Wurundjeri Council.		PM	Complete-
	• The archaeological excavation and recording methods will meet the standards set by Aboriginal Affairs Victoria (AAV) guidelines.		QM	Complete
	• Following the completion of the excavation there will be analysis of the artefacts excavated and a report produced outlining the results of this analysis.		PM, Archaeological Consultant	Complete.
Sieving of Site Deposits - AAV 7921-679 – Shamrock IA3, AAV 7921-678 – Shamrock IA2, AAV 7921-681 – Shamrock AS2 and AAV 7921-697 – Shamrock IA4	• The sites listed to the left will be subject to mechanical scrapes to a depth of between in 10-15cm to allow identification of any Aboriginal cultural material.	Consent to Disturb. Reference 5.	PM, Archaeological Consultant	Complete-
	• The scrapes will continue until sterile deposits are reached.			Complete-
	• In the event that stratigraphic deposits or some other important Aboriginal cultural feature is uncovered during these scrapes, all work will stop and the deposits will be excavated by controlled excavation (any such deposits excavated by controlled excavation will be analysed and reported upon to the standards outlined in the AAV guidelines).			Complete
	• All soil mechanically excavated at each of these sites will be mechanically sieved to ensure retrieval of all artefacts down to sterile deposits, and in accordance with the agreement between the Wurundjeri Council and Rinker Australia Pty Limited made under Condition 24 of the Consent.	-	PM, Archaeological Consultant	Complete-

	• This process involving artefact identification during sieving will be carried out by a qualified archaeologist and will involve representatives from the Wurundjeri Council.			-Complete
	• Any artefacts found in a non-stratigraphic context will be photographed and recorded by a qualified archaeologist. This material will be analysed and appropriately documented by an archaeologist.			Complete-
Monitoring Ground Disturbance within Extraction Limit	• Prior to construction works commencing within the extraction limit there will be monitoring of the disturbance of soil deposits by an archaeologist and representatives from the Wurundjeri Council.	-	PM, Archaeological Consultant	-Complete
	• Areas of ground surrounding the known sites and within the proposed extraction limit will be subject to mechanical scrapes to a depth of between in 10-15cm to allow identification of any Aboriginal cultural material.	Consent to Disturb. Reference 5.	PM, Archaeological Consultant	Complete-
	• The scrapes will continue until sterile deposits are reached.	-		-Complete
	• There will be at least one Wurundjeri representative assigned to each scraper.	-		Complete-
	• In the event that stratigraphic deposits or some other important cultural feature is uncovered during these scrapes, all work will stop and the deposits excavated by controlled excavation.	Consent to Disturb. Reference 5.	PM, Archaeological Consultant	-Complete
	• Any such deposits excavated by controlled excavation will be analysed and reported upon to the standards outlined in the AAV	Consent to Disturb. Reference 5.		Complete

Appendix 14

	Guideline for Conducting Aboriginal Heritage Assessments.			
	• Any artefacts found in a non-stratigraphic context will be photographed and recorded by a qualified archaeologist. This material will be analysed and appropriately documented by an archaeologist.	-	PM, Archaeological Consultant	Complete
Artefact Relocation	• Once all artefacts found have been properly analysed they will be returned to the Wurundjeri Council and will be relocated within the general vicinity at the discretion of the Wurundjeri Council.	Consent to Disturb. Reference 5.	QM	Complete-
Works Monitoring	• Officers from Aboriginal Affairs Victoria will be invited to access the site for the purpose of monitoring adherence to all conditions of the Consent and the Permit as specified in this EMP.	SHE Guideline 4.7 Community Awareness	Environmental Manager	Complete-

2.10 FIRE MANAGEMENT

2.10.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Fire Prevention Works	• Establish off-site fire prevention measures to be followed during periods of high fire risk.	Consultation with local Fire Authority	PM	Complete

2.11 WATER CONSERVATION

2.11.3 MANAGEMENT MEASURES

Management Measure	Action	Procedure/ Reference	Responsibility	Timing
Water Conservation	• Install rainwater tanks to collect water to be used for non-potable purposes.	-	PM	Complete

Meeting Summary

25th August 2021 (4.00pm – 5.00pm via Zoom)

Committee Members Present:	Matt Dodd	Holcim Australia
	Nathan Thomas	
	Joy Carberry	Local Community Representatives
	Don Petty	
	Dean Haeusler	Cardinia Shire Council
Apologies:	Stewart Burton	Holcim Australia
	Cr. Jeff Springfield	Cardinia Shire Council
	Rosemary Buczak	Local Community Representative
	Barry Strong	Earth Resources Regulation
Chairperson:	Lisa Barrand	Possibilities Pty Ltd

Welcome

Lisa welcomed everyone to the meeting. There were a number of apologies and a few calendar mix ups and so attendance was less than our normal excellent turnout however given the nature of the agenda items, it was decided to proceed with the meeting. Those present agreed that additional time would be provided for Community Representatives to provide final feedback on the draft EMP.

Update on actions agreed at previous meetings

Person Responsible

51.3 EMP 5-year review

The Chair noted that it has now been 5 years since the last review of the EMP itself and that this process should be initiated soon.

The intention for this meeting was to capture any final comments / questions regarding the draft revised EMP documents. As there were a number of ERC members not present however, in particular Community Representatives, it was agreed that time would be extended to allow final comments to be made. Community members are asked to forward any comments to Lisa as Chairperson by Monday morning the 30th of August at the latest.

The final documents have been brought forward by Holcim and reflect the list of amendments that the Committee has previously reviewed. It is anticipated that the final draft will soon be forwarded to the Cardinia Shire Council (as the primary authority) for consideration.

Matt Dodd

For reference, the following alterations to the EMP are being proposed:

- **Simplifying the report**
  Making the report simpler and more useable for ongoing management by separating out the 'once – off' and completed activities so that that are still able to be viewed but that these items do not clutter the reporting on ongoing management activities. Many of these 'once off' activities were completed more than 10 years ago.
- **Updating the document**
  Legislative, equipment and other elements will be updated. Names have been replaced with titles for simplicity.
- **Greenhouse Gas Net Emissions**
  The year on year % GHG emissions reduction target of 5% have been an increasing challenge that has been raised and discussed previously at this Committee. Holcim is exploring offset measures to assist meet the target (where onsite reductions were not feasible).
- **LRMP Review**
  The LRMP review (happening at the same time as the EMP review) has identified opportunities for further refinement and changes that Holcim expect will improve rehabilitation outcomes. Adjustments to the species list are proposed as well as other improvements to processes (such as seeding and weed management) based on improvements in industry best practice and on-site learnings. These will be shared for review with the Committee.

Environment Management Quarterly Report

The April - June 2021 Environmental Management Report (distributed with the agenda) was overviewed by Matt and Nathan, highlighting that operations at the site are very busy with ongoing strong demand. Mobile crushing is also taking place.

In terms of rehabilitation, hydroseeeding has commenced and planting will continue into spring on terminal faces. Matt will forward up to date photos with the final meeting summary.

Matt noted that a recent blast had been reported as particularly noticeable by one of the nearby neighbours. The blast monitoring measurements were all well within limits however it is thought that the position of the blast (high on the quarry wall) and the weather conditions at the time (very low cloud) may have been relevant.

The non- compliance related to water conductivity results that was noted in the report has been communicated to the EPA however no further action was required.

Other business

LRMP Report
Matt reviewed the latest LRMP report (6 monthly – distributed prior to meeting) and explained the new format in accordance with the recent recommendations. Joy noted the growth of weeds on the road sides given the wet and moderate conditions (particularly Flaxseed Broom) however this has not been noticed on site.

Appointment process for Community Representatives
Dean outlined the process for advertising and making appointments for the Local Community Representative positions on the Committee. It is anticipated that a notice will be placed in the Pakenham Gazette (but also provided to the Committee for distribution to relevant community groups) in the next few weeks with a selection process to take place run by the Council.

Note: These appointments are made for a 3 year term (similar to the role of Independent Chairperson) in accordance with our Terms of Reference.

Community

Nathan once again reminded the Committee that Holcim was interested in any community projects that might benefit from Holcim's support. (Joy to consider her current planting project that is in need of people to assist).

Meeting Dates for 2021

The remaining meeting date for 2021 is as follows:

24th November 2021 Site tour at 2.30 pm (if permitted) , followed by meeting at site office at 4pm

Items for consideration at next revision of EMP

(Note: These items have been written into the draft revised EMP and will be removed once approved)

Understory Plantings

Consider multi species plantings for understory areas where original revegetation / screening plantings only included a single species of tree. This should be done as soon as practicable after trees thin out to allow for successful planting.

Quarterly reporting of LRMP activities and outcomes

Should the LRMP report be quarterly, six monthly or annual?

Matt Dodd <matt.dodd@lafargeholcim.com>

Comments regarding EMP Draft

1 message

Lisa Barrand <lisa@allpossibilities.com.au> 30 August 2021 at 16:18
To: Matt Dodd <matt.dodd@holcim.com>
Cc: Nathan Thomas <nathan.thomas@holcim.com>

Hi Matt,

Hope you had a good weekend!

The only comment received from community representatives in relation to the draft EMP relates to Appendix 5: Dust procedure as follows:

In the first dot point under the Quarry Manager's responsibilities the 'and' should be changed to 'must' or 'should' or 'to' and an 'of' should come after 'aware'.

The opportunity to revisit the documentation was appreciated.

All the best and talk soon,

Lisa

Lisa Barrand
Director
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Possibilities is on the land of the Boon Wurrung people of the Kulin nation