Appendix J
Preliminary Quarry Management Plan

FINAL REPORT

Reavill Farm Pty Ltd and Tucki Hills Pty Ltd

Champions Quarry Expansion
Preliminary Quarry Management Plan

November 2009

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FINAL REPORT

Reavill Farm Pty Ltd and Tucki Hills Pty Ltd

Champions Quarry Expansion
Preliminary Quarry Management Plan

November 2009

Reference: 0098287_QMP

For and on behalf of:
Environmental Resources Management Australia

Approved by: Murray Curtis

Signed:

Position: Managing Partner

Date: 22 September 2008

CONTENTS

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1 INTRODUCTION

Environmental Resources Management Australia (ERM) was commissioned by Reavill Farm Pty Ltd and Tucki Hills Pty Ltd to prepare a preliminary Quarry Management Plan (QMP) for the proposed expansion of its sandstone quarry (known as Champions Quarry) located at 1586 Wyrallah Road, Tuckurimba, approximately 16km south of Lismore, NSW. The Project Site location and Project Area is shown on *Figure 1.1*.

1.1 SCOPE AND PURPOSE

Champions Quarry has an existing 2006 development consent to extract sandstone within the Project Area, limiting its production to 29,000 cubic metres per annum (approximately 64,000 tonnes per annum). The proposed expansion will involve the extraction up to approximately 6.25 million tonnes of sandstone resource at a maximum extraction rate of 250,000 tonnes per annum and importantly, the implementation of a sand washing plant. Resources and geological assessment of the Project Site have established that up to 12 million tonnes of sandstone materials exist (Coffey Geotechnics, 2007).

The extraction of the sandstone resource will take place within an '*operational area*' of approximately 16 hectares (herein referred to as the Project Area), which is divided into two separate extraction areas (referred to as the *Central* and *Southern section areas*). The sequential extraction and rehabilitation within 'section areas' will take place in up to three '*work cells*' that will have a maximum area of three hectares each. The proposed site layout is presented in *Figure 1.2*.

This preliminary QMP has been prepared for inclusion in an Environmental Assessment prepared in support of a Major Project application for the proposed quarry expansion.

The Preliminary QMP has been prepared to provide guidance with regard to the proposed specific strategic approach to quarry operational, environmental and safety management. The Preliminary QMP also provides a framework for the documentation of monitoring procedures and safety reporting at the quarry.

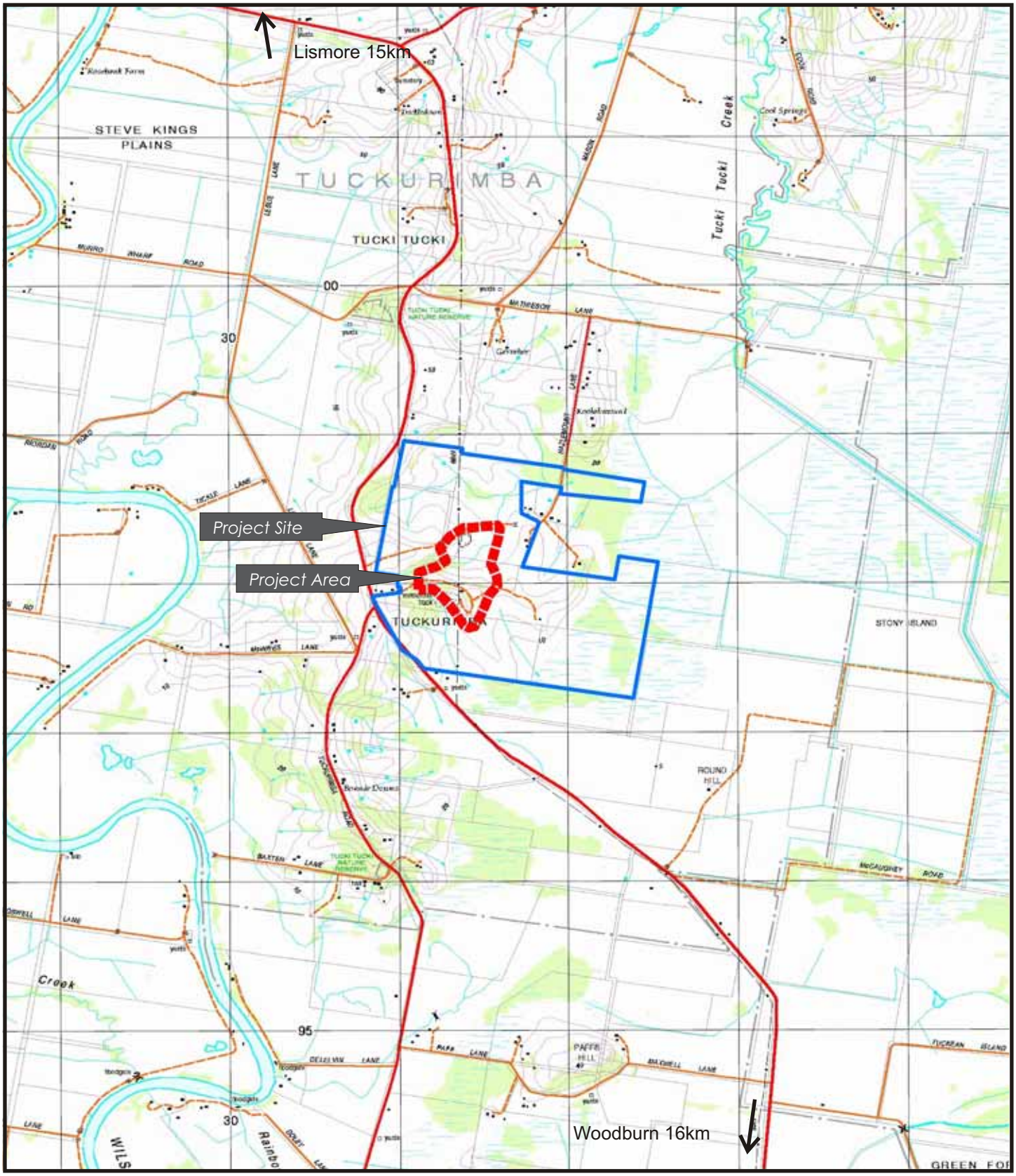

Figure 1.1

Project Locality Plan

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287pm_01		
Date:	12/08/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	Department of Lands		
Scale:	Refer to Scale Bar		

N

0 0.5 1km

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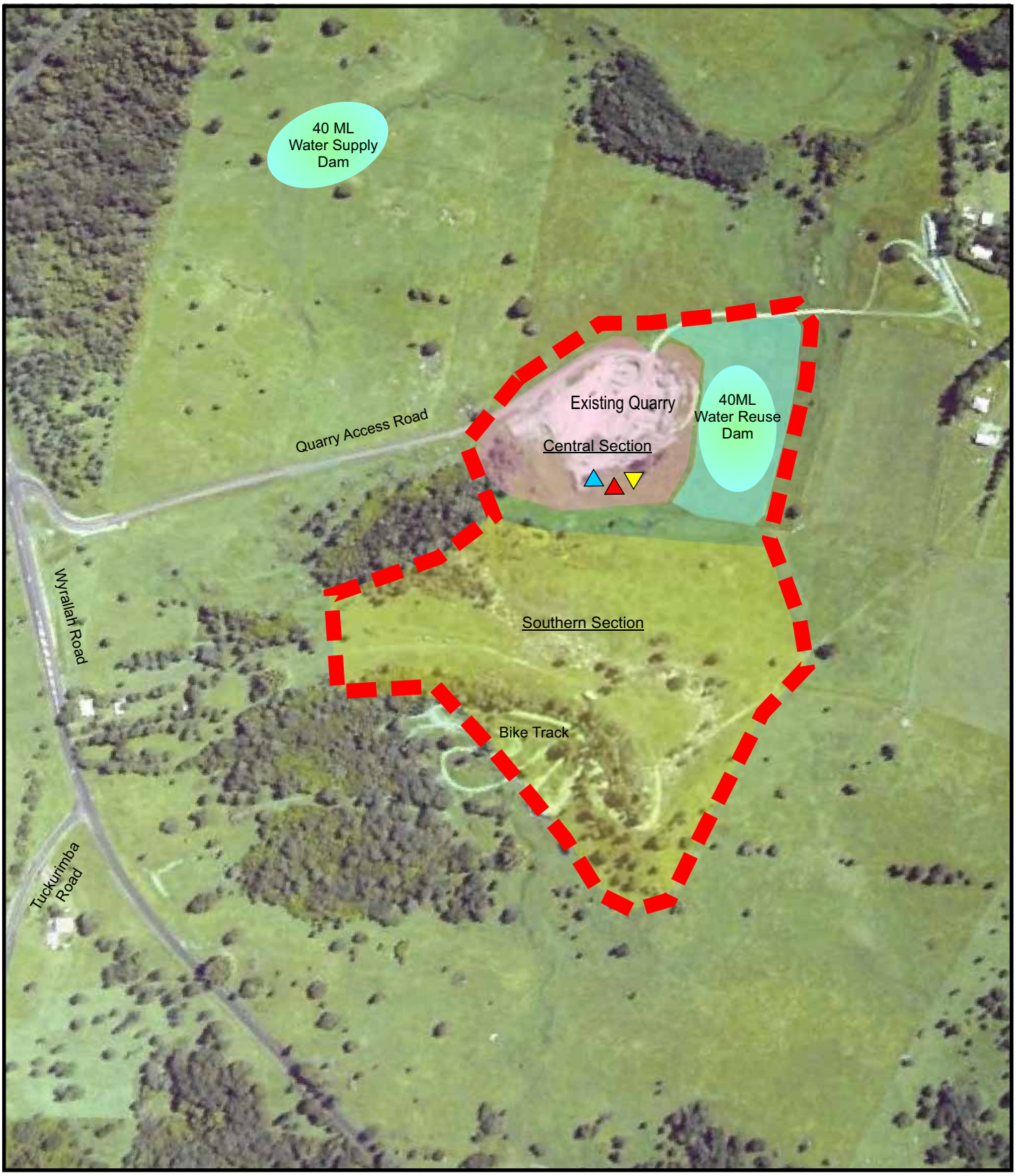

Legend

- Extent of Quarry Extraction and Operations (Project Area)
- Washing Plant
- Processing Plant
- Service Area and Temporary Stockpile Holding Area
- Water Management Dam
- Central Section
- Southern Section
- Water Management (Non-quarrying area)

Figure 1.2

Proposed Project Area Layout

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287pm_03	Suffix No:	V4
Date:	12/08/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	-		
Scale:	Refer to Scale Bar		

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0 50 100 150 200 m

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2 *QMP OBJECTIVES*

The objectives of the Preliminary QMP are to provide an outline document that:

- provides an overview of the proposed operational, environmental, and safety management strategies for the Project Area and quarrying operations;
- provides an understanding of existing Project Area conditions;
- provides plans to manage the quarry to minimise and/or mitigate potential environmental impacts;
- provides a process for monitoring off-site environmental performance with regard to future environmental compliance requirements;
- provides a system to quickly identify and correct environmental degradation or non-compliance with any future consent requirements;
- identifies safety management needs for the quarry; and
- identifies responsibilities for environmental and safety management at the quarry.

3 ASSESSMENT

The location, layout and environmental characteristics of the Project Site and Project Area are discussed below.

3.1.1 Property Description

The existing quarry and proposed expanded quarry footprint (the Project Area) is located on land described as:

- Lot 5 - DP 857530 - Hazlemount Lane, Tuckurimba
- Lot 1 - DP 729118 - Wyrallah Road, Tuckurimba
- Lot 4 - DP 588125 - Wyrallah Road, Tuckurimba
- Lot 183 - DP 1013042 - Wyrallah Road, Tuckurimba
- Lot 1 - DP 127550 - Wyrallah Road, Tuckurimba
- Lot 101 DP 755746 – Wyrallah Road, Tuckurimba

The existing quarry (refer *Photograph 1* below) and the access road are contained within a larger rural holding owned by Reavill Farm Pty Ltd and Tucki Hills Pty Ltd of approximately 350 hectares.

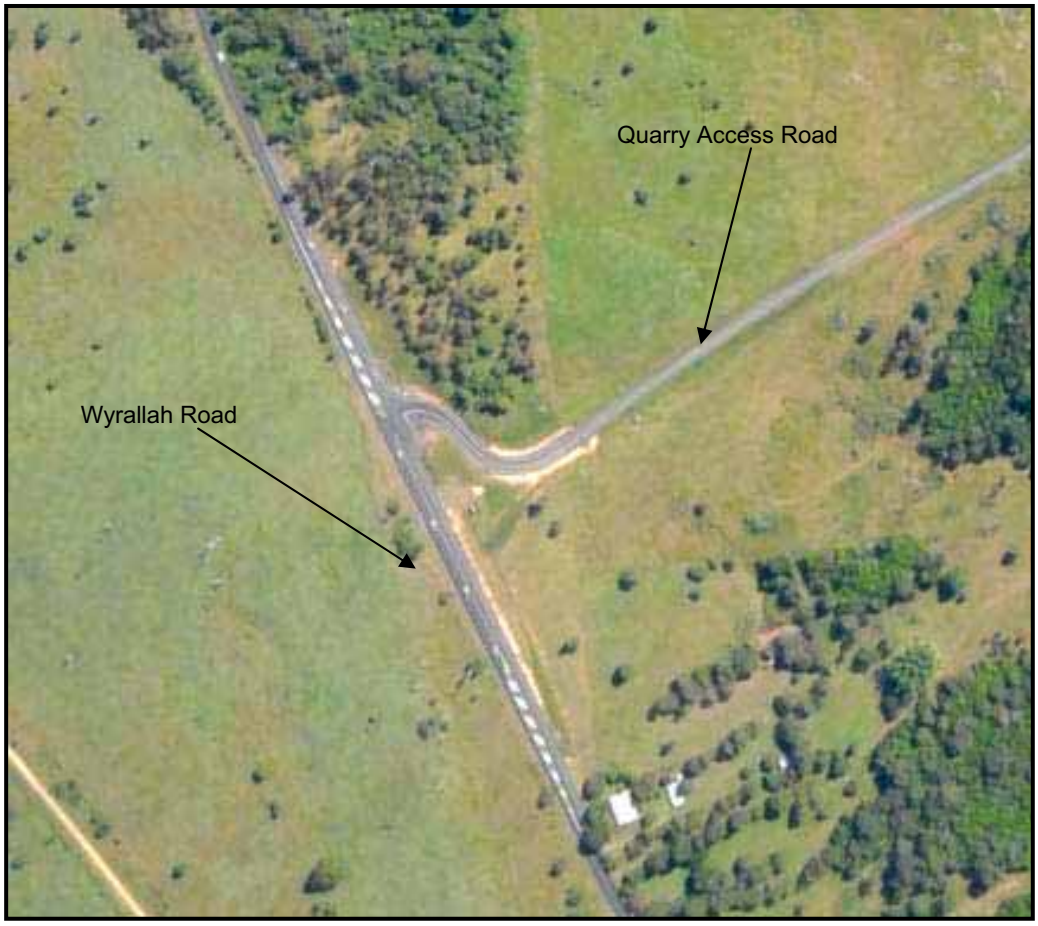
It is noted that the approximate quarry footprint as shown in *Figure 1.2* above will be further refined via a detailed survey in order to ensure operation of the project is consistent with final quarry plans, as well as to ensure the avoidance and management of environmental assets on the Project Site. This is not expected to result in a significant increase or decrease in the size of the Project Area footprint.

Photograph 1 – Existing Sandstone Quarry Operation

3.1.2 Quarry Access

The access to the project Area is via the existing access road from Wyrallah Road.

The intersection of the access road and Wyrallah Road (refer *Photographs 2* and *3*) has been recently upgraded to accommodate current and future quarry traffic movements. Internal haulage roads will be constructed between the operational 'work cells' and the *Central* section.



Photograph 2 – Newly Constructed Wyrallah Road Intersection

Photograph 3 – View West of Newly Constructed Wyrallah Road Intersection

3.1.3 Landform and Topography

The Project Area is located off a ridgeline system running north-south between the Wilsons River to the west and cane farms to the east. The elevation ranges from approximately 50 metres Australian Height Datum (mAHD) in the *Southern Section* to approximately 6mAHD at the eastern and north eastern boundary of the Project Area (refer *Figure 3.1*).

A gully depression occurs between the *Central* and *Southern* extraction areas draining east, then north along the eastern boundary of the Project Area. The area to the north of the main quarry access road generally slopes to the north toward an ephemeral drainage depression and northeast toward the ephemeral drainage depression on the eastern Project Area boundary.

3.1.4 Geology and Soils

According to the *Department of Mines, Tweed Heads, 1:250,000 Geological Series Sheet SH56-3, first Edition (1972),* the Project Area geology consists of Quaternary aged river gravels, alluvium, sand, and clays. This is underlain by Jurassic-Cretaceous aged Kangaroo Creek Sandstone which is comprised of quartz sandstone and conglomerate. The Kangaroo Creek sandstone is thus underlain by the Jurassic Walloon Coal Measures which is comprised of shale, sandstone, coal and ironstone. The Wallon Coal Measures may then be underlain by the Silurian aged Neranleigh-Fernvale Group which consists of Greywacke and slate phyllite quartzite.

The *Soil Landscape of the Lismore-Ballina 1:100,000 Sheet* (Morand, 1994) identifies two soil landscapes occurring in the vicinity of the Project Area comprising a variant of the 'Wollongbar' erosional and a variant of the 'Coffee Camp' colluvial landscapes. The erosional 'Wollongbar' soils are typically derived from basalts and are mostly deep (>200cm) Krasnozems and stonier Krasnozems on crest/ upper slope boundaries.

The colluvial 'Coffee Camp' soil landscape comprises footslopes and low hills on Kangaroo Creek sandstone. Soils are likely to comprise of shallow (<100cm), moderately well drained lithosols on ridges and crests; moderately deep to deep (60-150cm) Yellow Podzolic soils, with Red Podzolic and brownish Red Podzolic soils on slopes; and, deep (>150cm), rapidly drained Earthy Sands and deep (>100cm), well drained Red Earths on lower footslopes and depositional areas.

The latter 'Coffee Camp' soil landscape is the dominant soil landscape within the defined operational area.

Acid Sulphate Soils

A review of available former Department of Land and Water Conservation (DLWC) Potential Acid Sulphate Soils (PASS) Risk mapping (1998) indicates PASS are not expected to occur within the proposed extents of the expanded quarrying operation. An area to the east of the *Central* and *Southern* quarry have been classified a *low probability of occurrence* between 2 - 4 m Australian Height Datum (mAHD), while a large region denoted as high probability occurrence of ASS at between 1 - 2mAHD is located further to the east. An acquired digital version of the DLWC 1998 mapping layered onto an aerial photograph with the proposed quarry development Project Area are shown of *Figure 3.2.*

The corresponding PASS mapping provided in the Lismore City Council *Local Environment Plan* indicates that the proposed quarry development is to be undertaken within Class 5 lands for works within 500 m of Class 1-4 lands. However, the proposed works are not expected to lower the water table in Class 1-4 lands to below 1 m AHD, given that the lowest point of quarrying will be 8m AHD.

Agricultural Suitability

The relative suitability of the land for agriculture is classified as *Class 3* in accordance with the *Agricultural Land Classification Map* (NSW Agriculture, 2001). However, it is important to note that the land suitability mapping has been developed for the primary purpose of planning at the strategic level and direct application to the site specific level, without ground-truthing, can be inaccurate.

Class 3 lands are defined as grazing lands or lands well suited to pasture improvement. It may be cultivated or cropped in rotation with sown pasture. The overall production level is moderate due to edaphic or environmental constraints. Erosion hazard, soil structural breakdown, surface stone or other factors, including climate, may limit the capacity of the land for cultivation and soil conservation or drainage works may be required.

Legend

Extent of Quarry Extraction and Operations (Project Area)

Contours 2m

Figure 3.1

Project Area and Surrounds Topography

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287pm_GIS05_EA_F2.1		
Date:	17/08/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	TN
Source:	Champions Quarry		
Scale:	Refer to Scale Bar		

N

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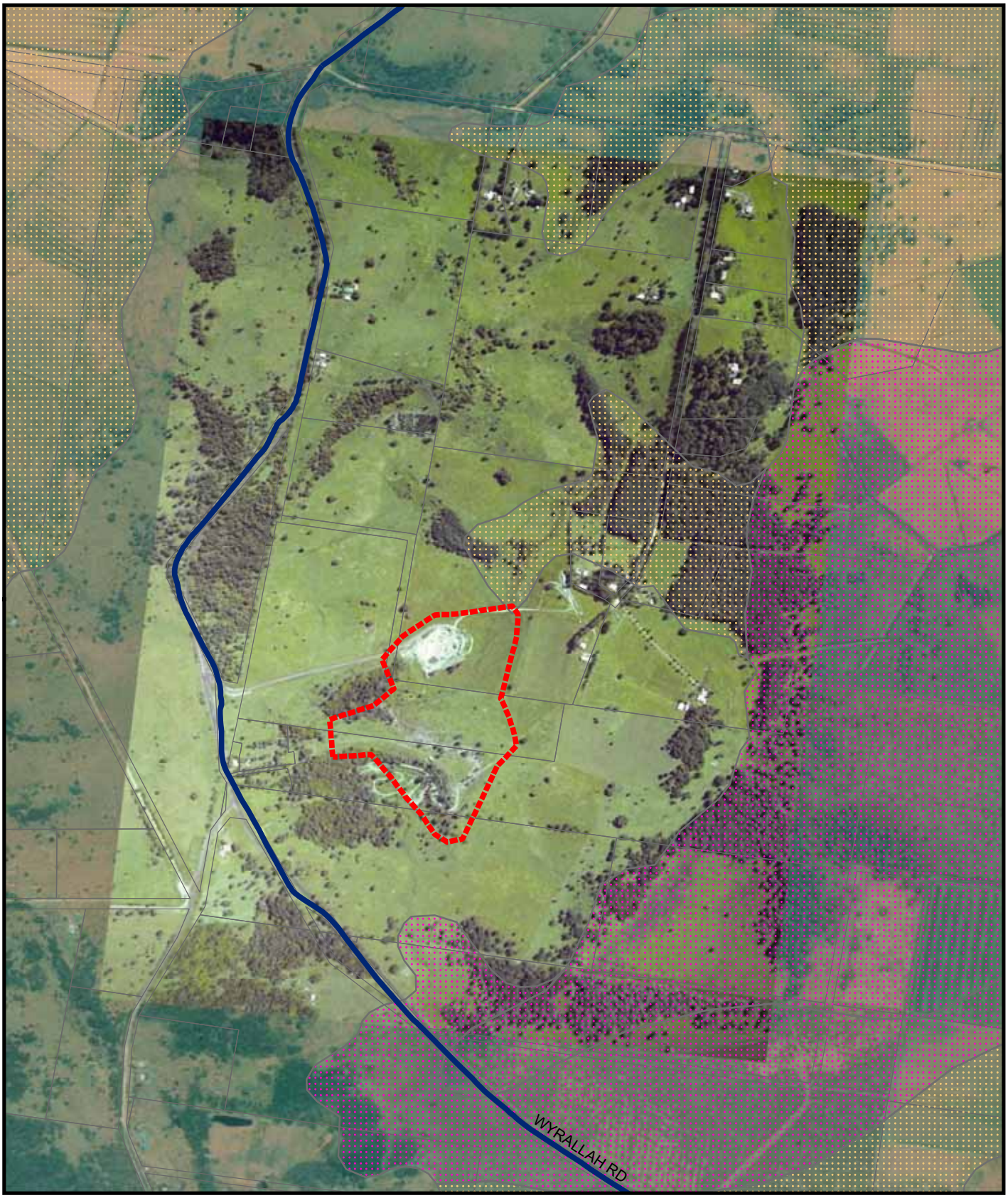

Legend

Project Area

NSW Acid Sulfate Soil Risk

High probability of occurrence (1-2m)

Low probability of occurrence (2-4m)

Figure 3.2

Tuckurimba
Acid Sulphate Soils
Risk Map

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287_GIS05	Suffix No:	A0
Date:	12/08/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	LPI 2007		
Scale:	Refer Scale Bar		

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3.1.5 Hydrology and Hydrogeology

Local Meteorology

Long-term climate data is available from a Bureau of Meteorology (BoM) weather station located in Lismore, approximately 16 km north of the Project Site.

On average, January is the warmest month in Lismore with a mean daily maximum of 29.9ºC. The coolest month is July with a mean daily minimum temperature of 6.5ºC.

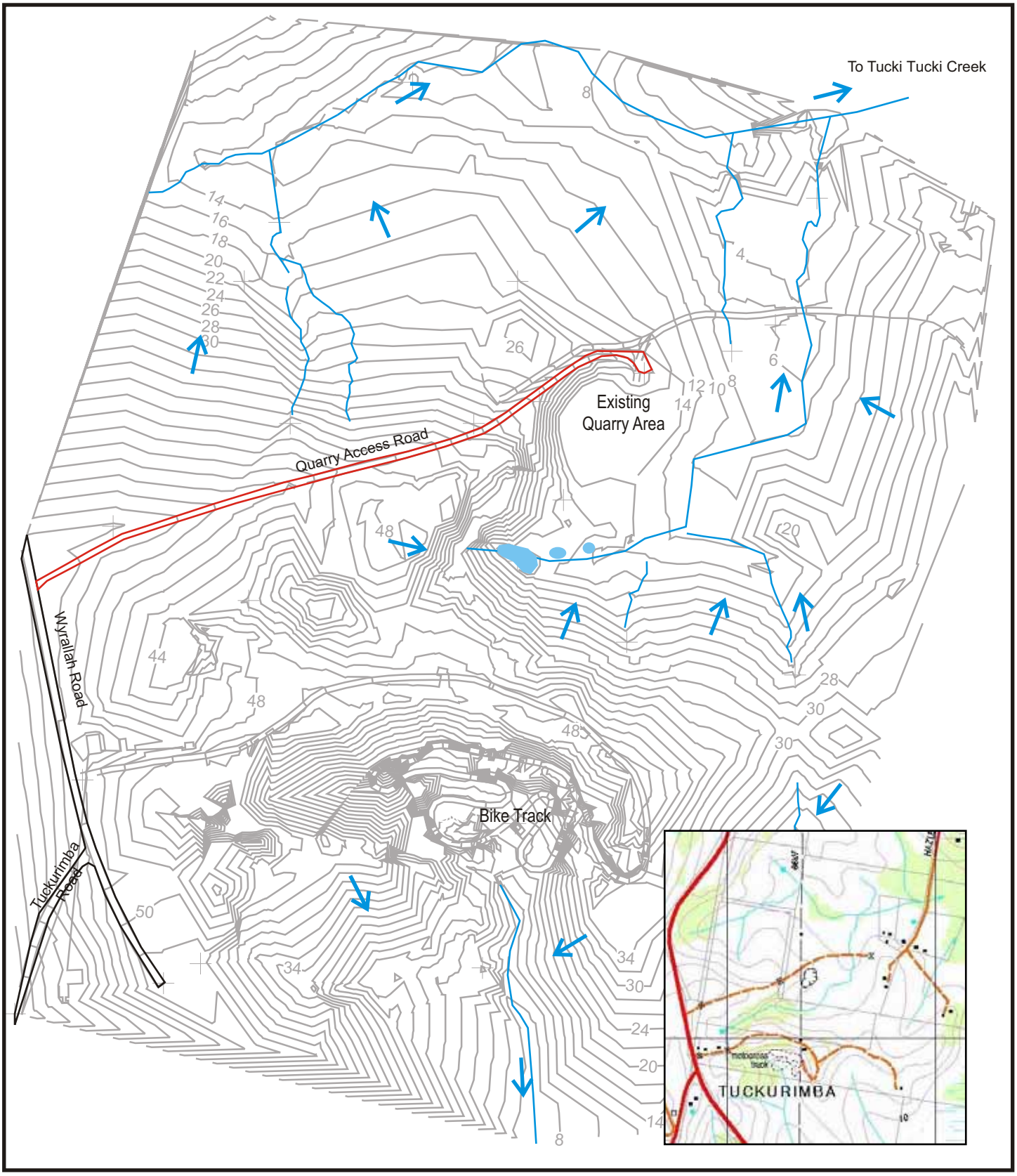
The mean annual rainfall at Lismore is 1343.1 mm. The mean number of rain days annually over this period is 104.4 days. On average, March is the wettest month with a mean monthly rainfall of 188.4 mm, whilst September is the driest month with an average of 50.4 mm.

Surface Water

The Project Area generally drains to the northeast towards Tucki Tucki Creek via several ephemeral drainage depressions on-site into an unnamed intermittent water course along the eastern boundary of the Project Area. During flood events water leaving the Project Area can mix with flood waters from Tucki Tucki Creek to drain generally south toward adjoining the low lying flood plain.

Tucki Tucki Creek is located approximately 3.0 kilometres from the Project Area. An area in the south of the Project Area (the motocross track) naturally drains to the south. Proposed extraction activities in this area will result some diversion of this surface flow back to the north.

The floor of the existing *Central* section drains into a newly constructed sedimentation pond and then into the original sediment control traps to the east of the quarry. No large water supply or reuse dams are currently present on the Project Site. The existing drainage and proposed Project Area drainage are presented on *Figure 3.3*and *Figure 3.4*below.



Legend

- Access & Haul Rds
- Ephemeral Creeks
- Direction of Surface Drainage
- 2 metre contours
- Existing dams

Figure 3.3

Catchment Characteristics

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287pm_05_QMP		
Date:	25/11/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	Inset - Department of Lands (2006)		
Scale:	Refer to Scale Bar		

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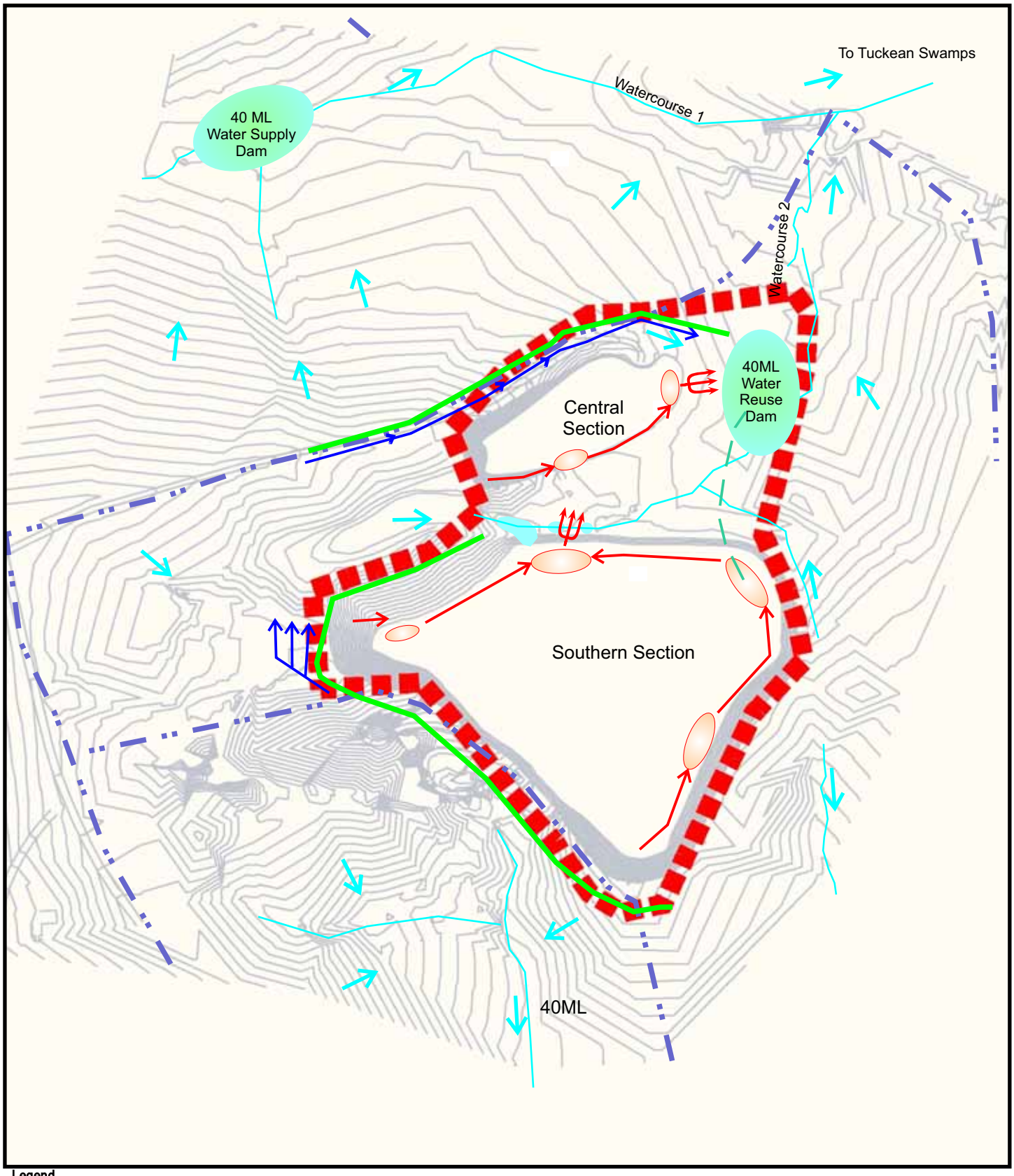

Legend

- Access & Haul Roads
- New Dams
- Existing Dams
- Sediment Basins (Indicative)
- 2 metre contours
- Ephemeral Creeks
- Contour Bank
- Gravity pipeline
- Subcatchment Boundary
- Direction of Surface Drainage
- Catch Drain (dirty water)
- Level Spreader
- Level Spreader
- Upslope Clean Water Diversion

Figure 3.4

Conceptual Drainage Plan

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287pm_GIS04		
Date:	25/08/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	VGT		
Scale:	Refer to Scale Bar		

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Groundwater

An existing wind mill and well is located adjoining the intermittent watercourse approximately 250m to the northeast of the existing quarry and is at elevation of approximately 6mAHD. During 'normal' seasonal conditions ERM understands that the water in the well stands at approximately 1.5m below ground surface.

Geological investigations undertaken encountered groundwater in six boreholes advanced across and adjacent to the Project Area (Coffey Geosciences, 2007). After heavy rain relatively high standing water levels were recorded in the three boreholes that were converted to monitoring wells (BH3, BH5 and BH6, refer to figure in *Annex B* of Coffey Geosciences report). However, slug testing undertaken in all monitoring wells has indicated very low recharge rates and low calculated conductivity ($<E^{-7}$) in these wells. This suggests that the groundwater encountered is likely to represent shallow perched seepage water in the sandstone. Refer to ERM (2009) *Champions Quarry - Soil and Water Management Plan* for more information.

It is also noted that the groundwater gauging and slug testing events occurred immediately following significant rainfall in January 2008, which lead to local and regional flooding. ERM understands that groundwater was also observed flowing from surface seepages at higher elevations on the southern ridgeline within the Project Area at this time.

3.2 HISTORY OF EXTRACTION

Sandstone extraction activities within the Project Area boundary have been undertaken since 1959 within the *Central Section*. The quarrying has previously been undertaken as a rip, screen, and loading operation. The existing quarry covers approximately 1 hectare, while the current approved extraction area covers 2 hectares. The approved annual extraction limit was increased from 5,000m^3 per annum to 29,000 m^3 per annum (64,000 tonnes per annum) in 2006.

4 WORKS AND ENVIRONMENTAL INTERACTIONS

4.1 PROPOSED ACTIVITIES

Quarrying activities will be conducted in accordance with the descriptions provided in the *Environmental Assessment* report (ERM, 2009a). This document and its supporting technical reports are to be referred to for more detailed information on the proposed development and its environmental interactions.

Activities include:

- removal and stockpiling of topsoil and overburden from three hectare '*work cells'* using a bulldozer/s and/or excavator/s;
- excavation of sandstone resource by ripping and pushing the material to create stockpiles of unprocessed material at the base of the '*work cell/s'*;
- use of front end loader/s, crushing and screening plant and/or excavator/s to transfer material for direct transportation either off-site or to the *Central* processing area for further processing;
- screening and washing of sand at the *Central* processing area prior to stockpiling or loading for transport off-site;
- operation of facilities and auxiliary activities such as plant maintenance, weighbridge, storage facilities, water storages, erosion and sediment control basins, and bunds; and
- progressive staged rehabilitation of the '*work cells'*.

Figure 4.1 provides a schematic representation of the various processes for material extraction, processing, stockpiling and transportation off-site to be undertaken as part of the proposed quarrying activities.

4.1.1 *Sand Processing*

Depending on the required product output extracted raw materials may be crushed or screened, and/or washed prior to being sold on.

Mobile Crushing and Screening Plant

Mobile crushing and screening plant to be used at the site will consist of a Terex Pegson: XA400 Primary Jaw Crusher, a 428 Trackpactor Tertiary Impact Crusher and a two deck Chieftan 2100 Powerscreen (or equivelant). Proprietary information for the Mobile Crushing and Screening plant is provided in *Annex B*.

Sand Washing Plant

The sand washing plant to be utilised in the *Central Section* processing area will consist of a Terex/Finlay 150E Hydrasander (or equivalent). The sand washing plant will receive crushed raw materials for separation of sand and fine materials. The fine materials are removed and exit the plant with the wash water discharge. This water is to be sent to the Water Reuse Dam for settlement in reuse in processing or dust suppression. This is achieved using a Cotraflow Spiral contained in the main settlement tank and a meshed bucket wheel for removal of specific sized sand particles.

The waste streams associated with this process are limited to separated fines and process effluent water (which contains the fines). While significant levels acidity is not expected for the waste water, the Water Reuse Dam is to be monitored and pH adjustments (e.g. Aglime) made if deemed necessary.

The sediment entrained in the Water Reuse Dam will be periodically removed and set aside for on-site rehabilitation purposes.

Proprietary information for the Mobile Crushing and Screening plant is provided in *Annex B*.

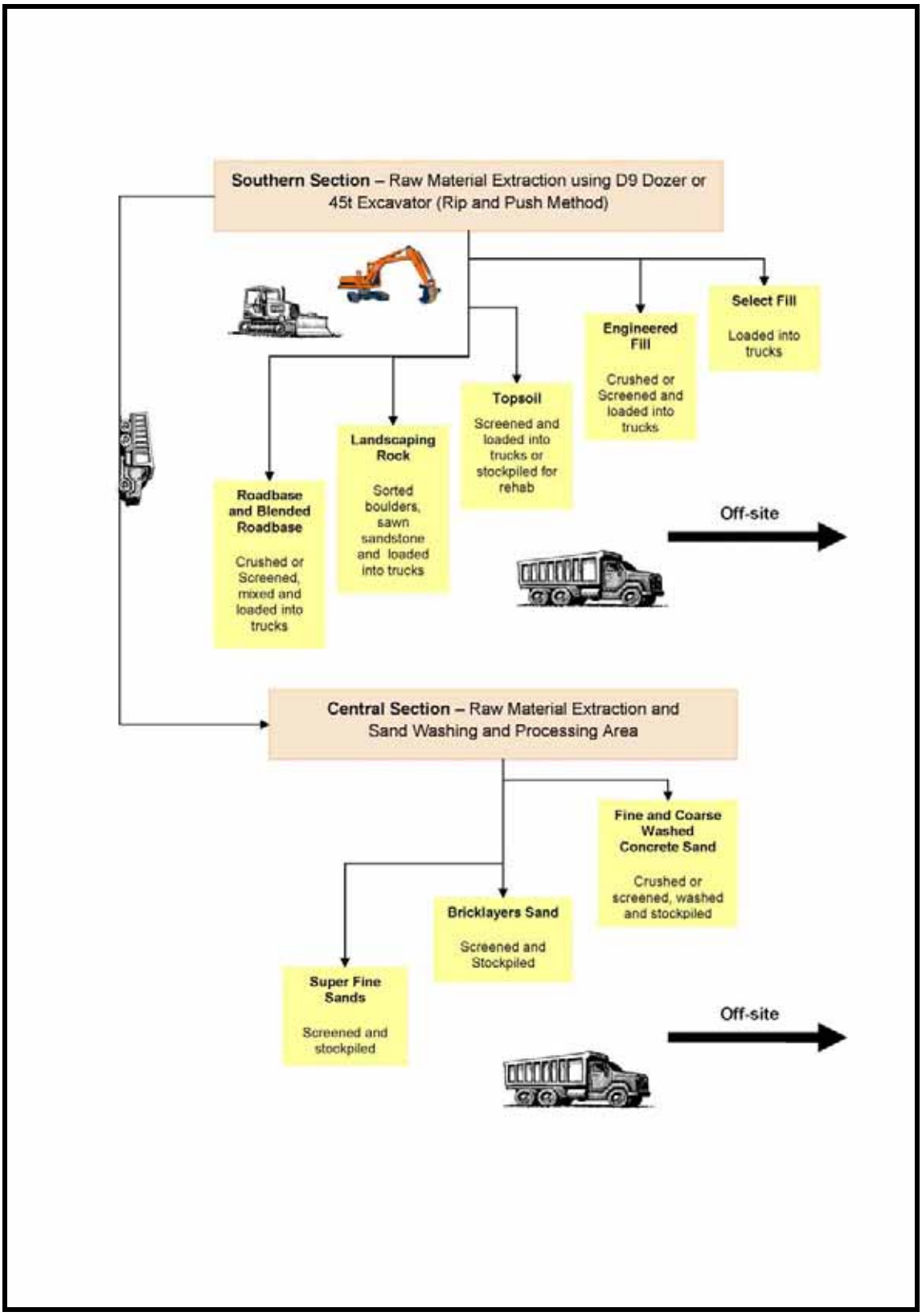

Figure 4.1 Champions Quarry Process Flow Diagram

4.2 *QUARRY EXCAVATION PLANS*

Quarry exaction plans were developed for the quarry based on the following parameters:

- all quarry floor runoff water to flow north for collection and treatment;
- all final quarry face batters are to be 45 degrees or 1 in 1 or benched as required;
- the total sandstone resource to be extracted under this QMP from the *Southern* and *Central Section* areas inclusive is approximately 6,250,000 tonnes;

The following assumptions were used to develop the quarry plans:

- density of the sandstone is approximately 2.2 grams/cm^3;
- the sandstone is laterally constant throughout the resource calculation areas; and
- no overburden or mid burden has been included in the calculations.

A site survey was used to undertake volume calculations using SURPAC 3D modelling software. The resulting resource assessment is provided in the following table.

Table 4.1 Resource Assessment

Quarry Identifier	Surface Area (Ha)	Volume (m^3)	Tonnes
Central Section	1.9	143,000	314,600
Southern Section	11.3	2,682,250	5,900,950
Total:		**2,825,250**	**6,215,550**

The quarrying of the sandstone resource will be undertaken in up to three by 3 hectare '*work cells*' within the defined sections of the quarry operation area (Project Area). The quarry will be progressively rehabilitated as each '*work cell*' is completed. An example of a nearby rehabilitated sandstone quarry contained within the owners larger rural holding is shown in *Photograph 3* below. Further information regarding the proposed rehabilitation strategy is provided in the attached *Environmental Plans* in *Annex A.*

Photograph 3 – Successfully rehabilitated on-farm sandstone quarry

Depending on site conditions, and the type of product requested, a typical 3ha "work cell" will be excavated to provide a working face of either:

- a constant slope of not greater than 1:1 (45º) which can be worked by excavator or dozer from either the top or bottom of the excavation; or
- final benching providing working faces with benches that are approximately 5m wide and 10m high where necessary.

The existing landform of the Project Area is shown in *Figure 4.2*, while the final landform is shown in *Figure 4.3.* An indicative 3D model of the final quarry landform is provided *as Figure 4.4* and indicative quarry cross-sections are provided *Figure 4.5.*

Quarrying will initially commence in the western portion of the *Southern Section* and progressively move eastward over time. It is estimated that quarrying would not commence on the highest elevation of the exposed ridgeline to the east of the *Southern Section* within the first 10 years of operation. Quarrying in the *Central Section* will continue westward and down in the short term.

Legend

Extent of Quarry Extraction and Operations

Figure 4.2

Quarry Plan - Existing Landform

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287pm_06_QMP		
Date:	25/11/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	VGT		
Scale:	Refer to Scale Bar		

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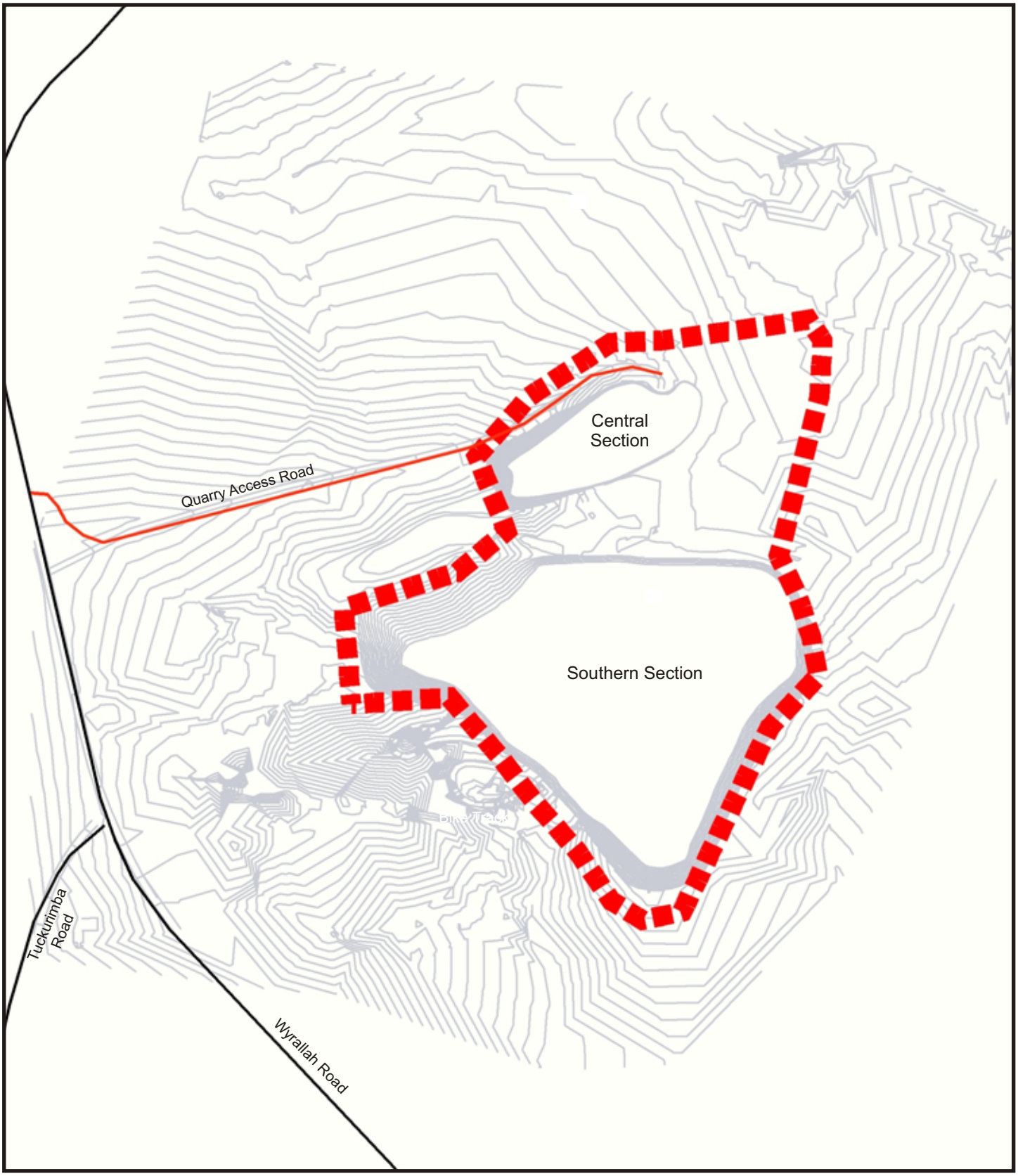

Legend

— — Extent of Quarry Extraction and Operations (Project Area)

Figure 4.3

Quarry Plan - Final Landform

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287pm_07_QMP		
Date:	25/11/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	VGT		
Scale:	Refer to Scale Bar		

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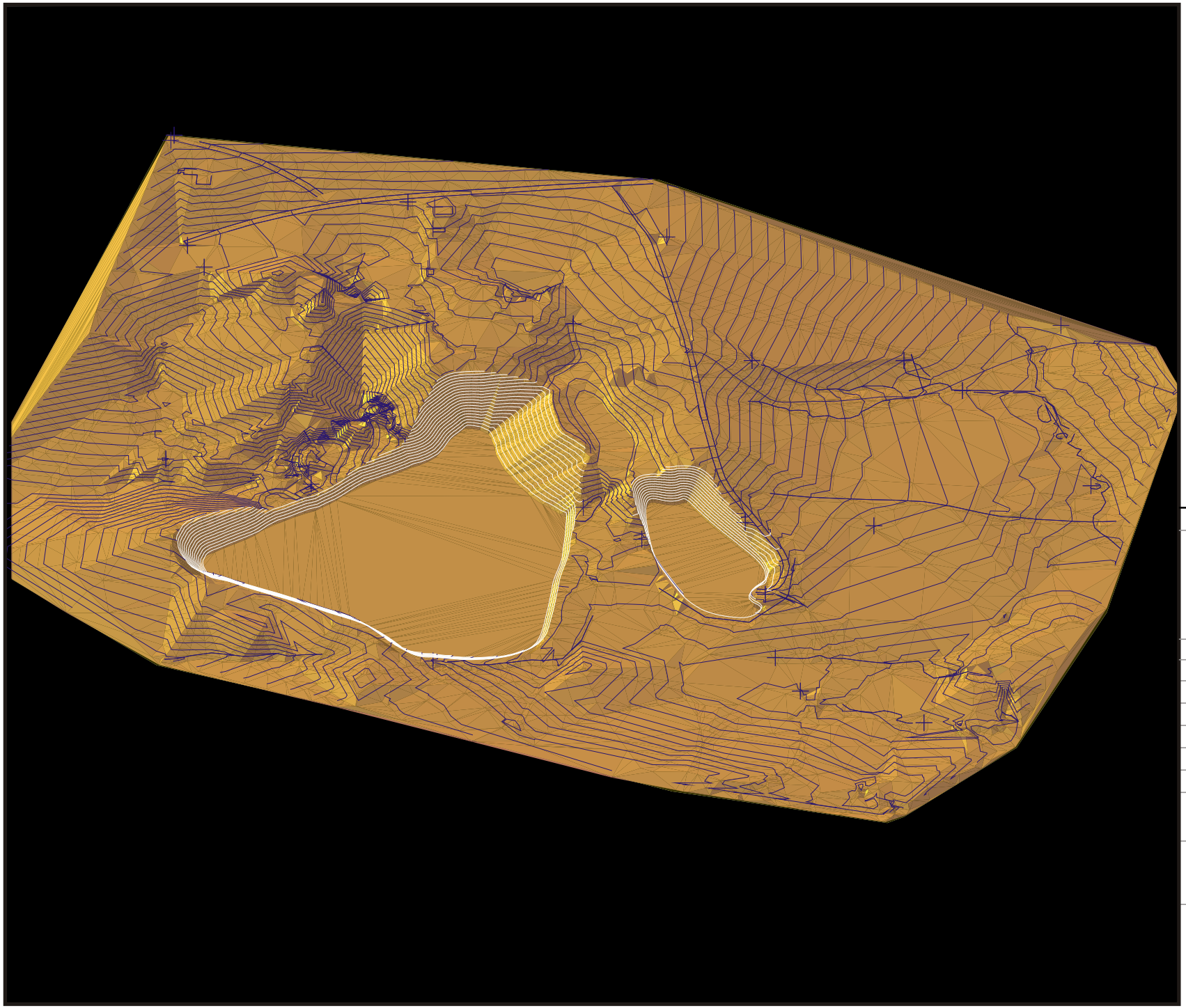

Figure 4.4

Three Dimensional - Final Landform

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287_08_QMP_3D		
Date:	13/08/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	VGT		
Scale:	-		

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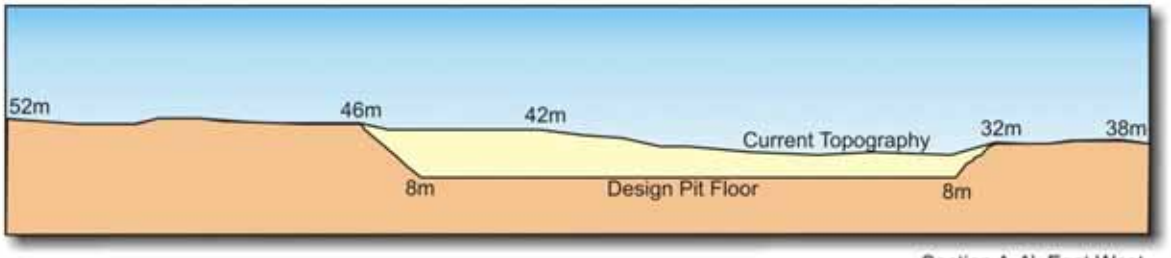
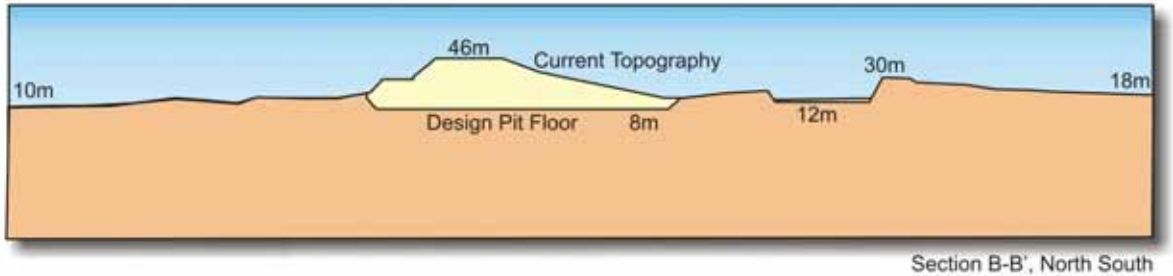
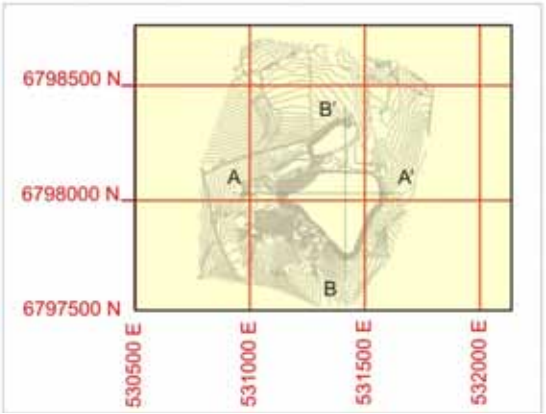
Quarry Cross-Sections



Section A-A', East West



Section B-B', North South



Section Location Map

Figure 4.5

Quarry Cross-Sections

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287_09_SWMP_CS		
Date:	13/08/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	VGT		
Scale:	-		

4.3 ENVIRONMENTAL ISSUES

The Environmental Assessment report (ERM, 2009a) has identified potential environmental impacts and mitigation measures, which have been used to identify key environmental issues. Key issues identified to be subject of environmental plans include:

- water flow and quality management;
- erosion and sediment controls;
- noise;
- traffic movements;
- air quality;
- greenhouse gas emissions;
- visual amenity;
- waste management;
- protection of flora and fauna;
- bushfire management;
- heritage management;
- rehabilitation of extracted areas; and
- social impacts on the local community.

5 ENVIRONMENTAL MANAGEMENT PLANS

Management plans have been created for key environmental issues, as well as for monitoring, training, incident and complaint management, and other relevant issues.

Plans are designed so that they may be separated and provided to employees or contractors in accordance with their relevant quarrying activities.

Each environmental plan lists objectives and actions, monitoring and reporting requirements, who is responsible for completing actions and where additional information may be obtained.

Table 5.1 below provides a list of Environmental Plans for the Project .Environmental Plans are provided in *Annex A*.

Table 5.1 List of Environmental Plans

Plan No.	Environmental Plans
EP 1	Induction and Training
EP 2	Incident Management
EP 3	Complaints Management
EP 4	Environmental Review and Reporting
EP 5	Traffic and Transport Management
EP 6	Hours of Operation
EP 7	Permissible Extraction Program
EP 8	Buffer Zones and Protection of Adjoining Lands
EP 9	Water Management
EP 10	Erosion and Sediment Control
EP 11	Heritage Management
EP 12	Noise and Vibration Management
EP 13	Air Quality Management
EP 14	Flora and Fauna Management
EP 15	Rehabilitation and Landscape
EP 16	Bushfire Management
EP 17	Community Relations
EP 18	Waste Management

The Environmental Plans also include reference to various sites checklists and monitoring documents. These will need to be finalised following approval of the proposed development to enable incorporation of any relevant conditions of approval or licence requirements.

6 SAFETY MANAGEMENT

6.1 SAFETY MANAGEMENT PLAN

A Safety Management Plan will be compiled in accordance with the *Mine Health and Safety Act 2004*. The term 'Mine', when used in this act, includes "*any place (not within a mine holding) where the extraction of material from land for the purpose of recovering minerals or quarry product is carried out*". Therefore, Champions Quarry is covered by this legislation.

The SMP will state how the health and safety of the persons who work at the quarry, or who are directly affected by the quarry, will be protected. The SMP will be prepared generally following the format presented in the Department of Mineral Resources - *Small Mines Safety Management Kit – A guide to safety management plans* (DMR, 2003).

6.2 HEALTH AND SAFETY POLICY

Champions Quarry recognises the need for employers to ensure the health, safety and welfare of all employees and visitors to the work. The safety objectives Champions Quarry supports to achieve safe working practices at the quarry are as follows:

- to promote and secure the health and safety of persons performing work;
- to protect persons performing work from risks to health and safety;
- to protect persons such as employees, and members of the public, from danger to health and safety in respect of any undertaking conducted, work performed or substance, manufactured, stored, kept, supplied, used or produced at or from that workplace;
- to assist in securing safe and hygienic work environments;
- to promote an occupational environment for persons performing work that is adapted to their physiological needs; and
- to reduce, eliminate, and control risks to the health and safety of persons performing work.

Champions Quarry is committed to providing a safe and secure work environment for its employees and contractors. It aims to ensure safe equipment, a safe and healthy working environment, and the development and maintenance of systems of work that minimise risk to health and safety.

7 QMP AND SMP RESPONSIBILITIES

While on-site, it is the responsibility of all employees, contractors and visitors of Champions Quarry to:

- be aware of QMP requirements relevant to their work;
- not cause or allow anything occur that may harm the environment (such as fuel spills, disturbance to plants and animals in buffer areas, uncontrolled dirty water runoff, or excessive noise);
- not act or undertake activities in an unsafe manner; and
- notify management of any incident or accident that may potentially harm the environment or human health.

The Quarry Manager (Champions Quarry Director) is responsible for implementation of the QMP, review and preparation of the QMP, and ensuring all quarry operators and visitors are aware of the requirements set out in the QMP.

7.1 MANAGEMENT STRUCTURE

As required under *Subdivision 3* of the *Mine Health and Safety Act 2004*, the Management Structure for the Quarry is outlined *in Figure 7.1* below.

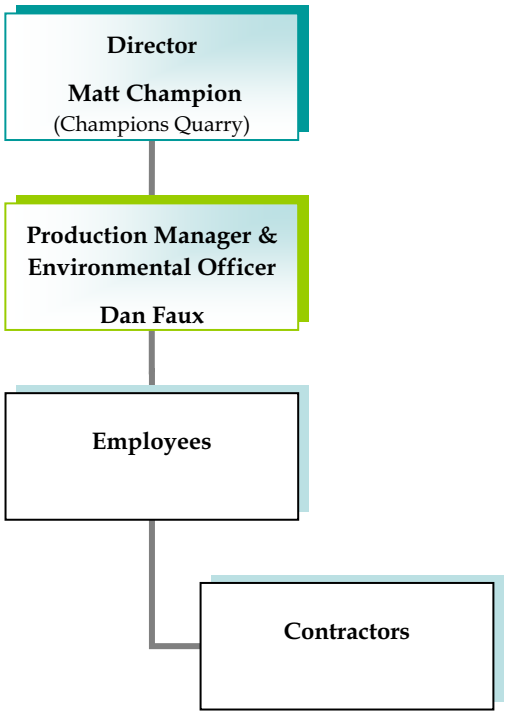


Figure 7.1 Management Structure for Champions Quarry

8 DOCUMENT CONTROL AND REVISION

8.1 CONTROL OF QMP AND SMP

To ensure the correct environmental and safety procedures and plans are used on-site, issue of future QMP and SMP will be controlled using a document register. The register will be retained at the Champions Quarry office.

8.2 REVIEW OF DOCUMENTS

The QMP is to be reviewed as required in response to:

- changes to quarrying activities or processes, including environmental controls, water storages, rehabilitation, etc;
- changes in environmental requirements, by changes to legislation, policy or best practice guidelines; or
- at the request of the Department of Planning or other regulatory authorities.

9 *INSPECTION, MONITORING AND REPORTING*

Environmental monitoring, together with regular Project Area site and safety inspections will be undertaken to monitor general conditions and environmental performance. This will ensure environmental plans are being followed. Each plan details proposed monitoring requirements. Monitoring results and completed monthly site inspection checklists will be retained on-site for inclusion in any required report to regulatory authorities.

Preliminary reporting requirements relating to environmental management are set out in *Environmental Plan 4*.

10 TRAINING

To ensure all persons working at the quarry are aware of their environmental and safety obligations and required procedures, each person will be inducted in the relevant procedures before commencing work. Re-training will also be undertaken if there are any changes to procedures, or if any non-conformance to procedures is noted by site inspection, monitoring, or by a regulatory authority or public complaint.

Training and induction is detailed in *Environmental Plan 1*.

Annex A

Environmental Plans

Annex A – Environmental Plans - Contents

Title	**EP 1 – Induction and Training**
Objectives	To ensure all persons working at the quarry are aware of their environmental obligations, specific environmental issues and control measures, as well as roles and responsibilities with regard to the environment on-.
Procedures	1. Environmental Induction for all Champions Quarry employees and contractors before starting work. Induction to cover following issues: i. Requirements of the QMP; ii. Specific environmental issues on the Project and control measures; iii. Roles and responsibilities; and iv. Environmental incident procedures. 2. Retraining sessions within one month of changes to relevant sections of the QMP. 3. Retraining sessions within one month to persons identified by *Complaints Register* or *Conditions Checklist* as not conforming to procedures. 4. All truck drivers entering Project Site for the first time to be provided with ' *Induction for Drivers*' form attached.
Monitoring	Status of inductions to be checked regularly (i.e. monthly) using *Condition Checklist*
Reporting	Record of all inductions and retraining, including name and date provided to be retained on-site.
Responsible Person	Production manger responsible for ensuring all persons working on-site are properly inducted and retrained as required.
Information/ References	*Induction for Drivers* form (to be prepared post approval) *Traffic Management Plan* (to be prepared post approval) *Condition Checklist* (to be prepared post approval)

Title	**EP 2 – Environmental Incident Management**
Objectives	To ensure all environmental incidents are promptly and effectively managed to minimise environmental impact.
Definitions	An Environmental Incident is an event that has the potential to harm the environment. Examples are fuel spillage, failure of erosion, or sediment controls, or excessive noise or dust generation.
Procedures	1. Stop action causing incident (i.e. switch off equipment). 2. Stop all work in the immediate vicinity of the incident until advised to continue work by the quarry supervisor – inform nearby workers if required. 3. Notify Champions Quarry Director 4. If there is a fuel spill – block flow paths or install temporary barriers or controls as necessary. Dispose any contaminated spill containment materials to appropriately licensed landfill facility. 5. Production manger to contact NSW DECC's pollution line (131 555) as soon as possible for any incidents causing or threatening harm to the environment. 6. Production manager to ensure incident area is controlled, cleaned up, problem rectified and prevention measures are put in place. 7. Fire extinguishers to be carried by all machinery used. Water cart is to be able to access all relevant areas of the Project .
Monitoring	*Condition Checklist* (to be prepared post development) to be completed monthly.
Reporting	1. Immediately for pollution incident causing or threatening harm to the environment. 2. As required by any licence conditions for exceeding dust of noise limits.
Responsible Person	1. All Champions Quarry staff are responsible for their own actions in preventing incidents occurring, containing spills, etc. 2. Quarry Director is responsible for enquiries into incidents, notification and written reports to regulatory authorities as required, and declaring an area safe after an incident.
Information/ References	**FOR MEDICAL EMERGENCIES AND SAFETY INCIDENTS REFER TO SAFETY MANAGEMENT PLAN** Relevant Licence Conditions (to be completed post approval) *Incident Contact Table* (to be prepared post approval)

Title	**EP 3 – Complaints Management**
Objectives	To ensure any problems brought to the attention of Champions Quarry by the local community and/or relevant authorities are documented and acted upon to avoid re-occurrence.
Procedures	1. Complaints telephone number signposted at front gate on Wyrallah Road and advertised in local newspapers prior to initial commencement of quarry operations. 2. All complaints/concerns raised by local community/relevant authorities to be recorded on *Complaints Register* by Quarry Director. *Complaints Register* to be retained on-site. 3. All complaints to be brought to the attention of the General Manger immediately. 4. Quarry Director to identify and initiate appropriate action in response to complaint and follow-up contact with complainant. 5. Problem/issues to be reviewed.
Monitoring	*1.* All complaints to be recorded on *Complaints Register.* 2. Complaints Register to be checked monthly using *Site Condition Checklist.*
Reporting	1. Summary of complaints reported to authorities if required by Licence condition.
Responsible Person	1. All Champions Quarry staff are responsible for recording telephone complaints on *Complaints Register*. 2. Quarry Director responsible for initiating follow-up action and contact with complainant.
Information/ References	*Complaints Register* (to be prepared post approval)

Title	**EP 4 – Environmental Review and Reporting**
Objectives	To review and report on environmental controls and their effectiveness to assess Project environmental performance and any required improvements.
Procedures	1. Monthly site inspection using *Site Condition Checklist* by Environmental Officer or delegate to check environmental procedures and controls and completion of any environmental requirements. 2. Environmental monitoring results required by relevant procedures to be reviewed by Environmental Officer to evaluate effectiveness of controls. 3. Summary monitoring report/s to be prepared for relevant authorities as per any licence requirements or conditions of approval.
Monitoring	1. Monthly *Site Condition Checklist* to be completed. 2. Various monitoring activities as required as per Environmental Plans
Reporting	Summary monitoring report/s to be prepared for relevant authorities as per any licence requirements of conditions of approval.
Responsible Person	Quarry Director to ensure all necessary reporting is undertaken and where necessary provided to relevant regulatory authorities.
Information/ References	*Complaints Register* (to be prepared post approval)

Title	**EP 5 – Traffic and Transport Management**
Objectives	To minimise the impact of trucks on the local road network, local residents and to comply with approved access and vehicle movements.
Procedures	1. Truck movements to and from the quarry to generally conform to an average of 24 loaded trucks per day leaving the quarry. 2. The operation of the quarry and haulage of material during the following days and operational hours: • Monday to Friday 7.00am to 5.30pm; and • Saturday 7.30am to 3.00pm. 3. All loads must be fully covered before leaving Project Area. 4. Maximum 30km/hr speed limit on all internal haul roads. 5. Wyrallah Road access to be inspected monthly by the Environmental Officer for accumulated sand/clay and maintained as necessary by removing material.
Monitoring	1. All loads to be inspected at weighbridge or loading point to make sure they are covered. 2. Weighbridge dockets or loader/s scale dockets to be retained for a record of the time of daily vehicle movements and volumes of materials leaving the Project Area. 3. Complaints Register to be used to record traffic management complaints. 4. Wyrallah Road access to be inspected monthly by the Environmental Officer for accumulated sand/clay and maintained as necessary by removing material. 5. Monthly inspection of road surface (Wyrallah Road intersection and internal haul roads by Environmental Officer for damage).
Reporting	1. Vehicle movement records to be maintained for reporting if required.
Responsible Person	1. Environmental Officer responsible for inspection of Wyrallah Road intersection and internal haul roads. 2. Truck drivers responsible to comply with permitted hours of operation and site induction requirements.
Information/ References	*EA (ERM, 2009a) – Traffic Report and Induction for Drivers/ Traffic Management Plan*

Title	**EP 6 – Hours of Operation**
Objectives	To ensure all quarrying operations and truck movements comply with the approved hours of operation.
Procedures	The operation of the quarry and haulage of material to only be undertaken during the following days and operational hours: • **Monday to Friday 7.00am to 5.30pm and** • **Saturday 7.30am to 3.00pm** Works not related to extraction, processing and haulage of material – such as equipment maintenance and environmental management – can occur outside of these hours where it is non audible at sensitive receivers.
Monitoring	Certified weighbridge dockets or loader/s scale dockets, and log book or computer records to be kept on-site recording arrival and departure times of vehicles within the quarry operation hours.
Reporting	Vehicle movement records to be maintained for reporting purposes if required.
Responsible Person	1. Weighbridge operator or loader operator/s responsible for accurate vehicle movement record keeping. 2. Truck drivers and Champions Quarry staff responsible to comply with permitted hours of operation.
Information/ References	*EP 5 – Traffic and Transport Management* *EP 12 – Noise and Vibration Management*

Title	**EP 7 – Permissible Extraction Program**
Objectives	To ensure that: • the maximum annual volume of extracted material complies with the approved average extraction limit of 250,000 tonnes per annum. • the extraction sequence complies with the proposed program (i.e. maximum three by 3ha '*work cells'* and depth of extraction).
Procedures	Extraction to be undertaken at the estimated annual stripping rates and in the sequence and to the depths as provided in the EA.
Monitoring	1. Weighbridge dockets or loader/s scale dockets to monitor monthly number and tonnage of loads leaving the Project Area. 2. Survey and Works as Executed plans showing completed extraction areas when necessary. 3. Quarterly monitoring of groundwater levels in on-site monitoring wells and comparison with monthly average rainfall by the Environmental Officer.
Reporting	Statement of compliance as required by approval and licence conditions survey plan showing status of extraction and rehabilitation.
Responsible Person	Environmental Officer to ensure extraction is undertaken as per proposed quarrying plan and site surveys and monitoring are conducted as necessary.
Information/ References	*EA (ERM,2009a) – Description of proposed development.*

Title	**EP 8 –Protection of Adjoining Lands**
Objectives	To minimise impacts of the operation on nearby landuses and sensitive environmental areas such as the Hoop Pine gully.
Procedures	1. The Project Area boundary is to be clearly delineated with pegs and safety wire. 2. Boundaries to sensitive areas to be clearly delineated to ensure site operations do not impact these areas. 3. Rehabilitation areas to be clearly delineated to avoid and manage these areas in order to promote revegetation efforts. 4. Measures will be implemented to ensure public safety and unauthorised access to the Project Area. 5. Bunding will be placed at specific locations to minimise potential visual, noise, and dust emission impacts of the quarrying operations.
Monitoring	6. Monthly inspection of buffer zones to monitor success of buffer markers to ensure no disturbance of buffer/conservation zones.
Reporting	Monthly *Condition Checklist*
Responsible Person	Environmental Officer is responsible for monthly inspection to monitor success of buffer zones protection and rehabilitation efforts.
Information/ References	*EA (ERM,2009a) – Description of proposed development.*

Title	**EP 9 – Water Management**
Objectives	To ensure discharge of stormwater from the Project Area is clear of sediment (<50mg/L Total Suspended Solids) and pH is within adopted range for protection of aquatic ecosystems. To ensure compliance with the *Water Act 1912* and *Protection of the Environment Operation Act 1997*.
Procedures	***Surface Water*** 1. Install and maintain water management structures (diversion contour banks, sediment basins, erosion and sediment controls measures, and main storage dams) as per the *EA* and ERM (2009) *Soil and Water Management Plan (SWMP)*; *Managing Urban Stormwater: Soil and Conservation* (NSW Government, 2004) to contain and treat all rainfall and runoff resulting from a 80th percentile, 5 day rainfall event. 2. Construct clean water diversion for each active quarrying area. 3. Construct appropriately sized sedimentation basins within the excavated quarry floors to comply with design in *SWMP (ERM, 2009)*. 4. Construct main storage dams to capture water for on-site use for processing, dust suppression, etc. 5. Erosion and sediment control works to be installed in accordance with EP 10. 6. Minimise areas of disturbance by only clearing areas immediately prior to extraction and undertaking progressive rehabilitation (EP 15); 7. Where possible, maintenance of equipment and refuelling only to be carried out in designated workshop and refuelling area. 8. Chemical and fuels to be stored in 110% percent capacity bunded areas and fuel and oil spill containment materials to be retained on-site. 9. During rehabilitation constructed diversion contours and sediment ponds to be levelled to surrounding landform and topsoiled and revegetated once appropriate.

	Groundwater 10. Extraction not to occur within two metres of groundwater table (wet weather, high level) based on groundwater monitoring and survey information of the working area of the quarry. 11. In the event of groundwater being breached, operations in the vicinity of the affected area are to cease and authorities are to be consulted with respect to the basis upon which extraction may recommence. 12. Maintain a minimum of two groundwater monitoring bores at or adjacent to the Project Area.
Monitoring	1. During surface water discharge from the water reuse dam and reed beds water monitoring at discharge point daily for TSS, turbidity and pH. 2. Initial quarterly groundwater level monitoring of the monitoring bores on-site to be undertaken and following any periods of extreme wet weather. 3. Groundwater quality monitoring to be undertaken in the monitoring bores every 6 months. 4. Quantity of any extracted groundwater from supply bore (if applicable). 5. Surface water monitoring in Tucki Tucki Creek to be undertaken every 6 months at up-stream and downstream locations to compare to baseline data collected prior to the proposed expansion of the quarry operation.
Reporting	All water quality and monitoring data to be retained on-site and report to authorities as per any Licence requirements or conditions of consent.
Responsible Person	Environmental Officer or person/s authorised by Environmental Officer
Information/ References	*EA (ERM,2009a) - SWMP* *Figure EP 9.1 Groundwater Monitoring Locations* *Figure EP 9.2 Surface Water Management* *Managing Urban Stormwater: Soil and Conservation* (NSW Government, 2004)

Title	**EP 10 – Erosion and Sediment Control**
Objectives	To minimise and manage erosion and sedimentation on the Project Area and ensure that sediment laden runoff is not discharged from the Project Area. To comply with *Managing Urban Stormwater: Soil and Conservation* (NSW Government, 2004)
Procedures	1. Construct all internal all-weather surfaced access tracks with cross-fall, table drains and lead outs with appropriate sediment traps, headwalls and scour protection. 2. Divert dirty runoff and dam water to sediment basins, sediment traps and catch ponds as a primary means of sediment trapping before water is discharged to main storage ponds or off-site. 3. Sediment ponds to have markers in place indicating sediment storage capacity (if known), or 30% of design capacity of the basin. Sediment collected in sediment pond to be removed when design capacity of pond is reduced by 30%. Sediment/silt removed may be applied on-site within rehabilitation areas as a layer no greater than 100mm thick beneath topsoil (immediately prior to spreading of topsoil), or alternatively, removed off-site to landfill/waste recycling facility or on-site sediment dump. 4. Only clear areas immediately prior to extraction and progressively rehabilitate to minimise area of disturbance (see EP 15). 5. Inspect drainage and sediment controls monthly and conduct maintenance as required to ensure effectiveness. Where erosion is observed to be occurring, implement temporary erosion sediment controls (i.e. silt fence), or rehabilitation/stabilisation measures as per *Managing Urban Stormwater: Soils and Construction* (NSW Government, 2004). 6. Topsoil stockpiles to have a maximum depth of 3 metres and are to be sown with vegetation if stored for extended length of time. 7. Implement and maintain silt fence downstream of dam sites and at intersection of the boundary and ephemeral watercourse prior to decommissioning. Fence to be maintained along boundary until rehabilitation of watercourse occurs. 8. Silt traps within quarry floor drainage channel to be designed in accordance with *Managing Urban Stormwater: Soil and Conservation* (NSW Government, 2004) and consist of a gravel filled wire mesh or geotextile 'sausage', or similar, laid perpendicular to the direction of flow. Straw bales should not be used unless they may be securely anchored to the quarry floor.

Monitoring	1. Monthly inspection of all drainage and sediment controls on-site, including water storages, dam walls, outlet structures etc.
Reporting	Refer EP 9
Responsible Person	Environmental Officer or person/s authorised by Environmental Officer
Information/References	*EA (ERM,2009a) - SWMP* *EP 9.1 Groundwater monitoring locations plan.* *EP 9.2 Surface Water management plan* *Managing Urban Stormwater: Soil and Conservation* (NSW Government, 2004)

Title	**EP 11 – Heritage Management**
Objectives	To protect and mange any heritage items and archaeological material found on-site.
Procedures	If any unidentified heritage or archaeological sites are found during operation: 1. any works likely to affect such sites are to cease. 2. the NPWS are to be contacted. 3. necessary permits or consents to be obtained prior to recommencement of work. Burials Protocol Consultation with a local Aboriginal representative during the preparation of the *EA* (ERM, 2009a) indicated that burial sites may be present in the Tuckurimba area. It is however considered unlikely that burial sites would be present within the Project Area due to the shallow nature of the soils overlying the sandstone bedrock. The following Burial Protocol simply puts into place several protocols to be undertaken in the unlikely event of human skeletal material being uncovered on-site including: 1. all works in the immediate vicinity of the burial site should be halted; 2. the police contacted; 3. a Local Aboriginal Representative contacted; 4. if required a suitably qualified archaeologist or physical anthropologist contacted; and 5. once ascertained that the burial is in fact Aboriginal, the local Aboriginal community should be consulted on how best to proceed. Options available may include that the remains be reburied as closely as possible to their original location (i.e. on the proponents farm land) or relocated to another site.
Monitoring	To be documented in the event that materials are found.
Reporting	As above.
Responsible Person	Environmental Officer is responsible for reporting any finds to the DECCW and/or NSW Heritage Office and restricting access to the area.
Information/ References	*EA (ERM,2009a) – Heritage Section*

Title	**EP 12 – Noise and Vibration Management**
Objectives	To ensure that operational noise complies with NSW DECCW regulations.
Sources	Sources include wet and dry *Central* and *Southern* section `processing plant, loading plant, dozer/s, excavator/s, rock saw and jackhammer, water truck, off-site haul trucks and on-site haul truck/s.
Procedures	1. Construct earth bunds as per design specifications contained in EA. 2. Noise emission of any new equipment to be considered prior to purchase. 3. Refer to EP6 for hours of operation. 4. All road surfaces, vehicles and equipment to be regularly maintained to reduce noise. 5. Induction for Drivers to required truck speed limits and the limited use of exhaust brakes where safe.
Monitoring	Establish permanent monitoring points for ongoing compliance monitoring. Undertake operational noise compliance monitoring once quarry is fully operational and earthern and vegetative bunds have been installed.
Reporting	Provision of operational noise monitoring result to authorities if required.
Responsible Person	Environmental Officer to organise monitoring and reporting as required. Truck drivers are responsible for required action to reduce noise.
Information/ References	*EA (ERM,2009a) – Noise Assessment* *EP 6 – Operational hours*

Title	**EP 13 – Air Quality Management**
Objectives	To minimise dust generation and air pollution to prevent impact in surrounding residences and sensitive areas.
Procedures	1. Minimise the area of disturbance by only clearing areas immediately prior to extraction and progressive rehabilitation (see EP 15) 2. Maintain dust depression devices/controls to all processing plant. 3. Long-term topsoil and overburden stockpiles to be planted with a crop cover of non-invasive seasonal grasses. 4. Use water cart to suppress dust on unsealed roads, truck loading areas and stockpiles during dry conditions on days of operation. 5. Maximum 30km/hr on- speed limit to reduce dust generation. 6. All loaded vehicles to be covered before leaving Project Area. 7. Regular maintenance of mobile and fixed plant to minimise exhaust emissions.
Monitoring	Dust deposition monitoring if persistent dust emissions become evident during quarrying operations.
Reporting	Authorities to be contacted as required if allowable dust limit exceeded.
Responsible Person	Environmental Officer is responsible for observing conditions and instigating dust monitoring if deemed necessary. Quarry supervisor responsible for ensuring processing plant dust suppression equipment/controls are in place. Drivers responsible for adherence to speed limits, covering loads, regular plant/vehicle maintenance.
Information/ References	*EA (ERM,2009a) – Air Quality*

Title	**EP 14 – Flora and Fauna Management**
Objectives	To minimise impact on identified significant flora and fauna adjoining the operational Project Area.
Procedures	1. Clearly delineate identified vegetation to be protected (i.e. Hoop Pine gully) and ensure quarrying activities do not impact on such areas. 2. Carry out pre-clearance inspections, flora/fauna translocation, and micro-habitat salvage prior to felling any hollow bearing trees. 3. Progressively rehabilitate extraction areas. 4. Protect any adjoining bushland by maintaining buffer (EP 8). 5. Remove weeds and/or prevent from spreading. Council to be advised of any noxious weeds on-site (list to be obtained from Council and retained on-site). 6. If any unidentified heritage or archaeological sites are found during rehabilitation works, refer to procedures in EP 11.
Monitoring	1. Monthly assessment of buffer markers and fences to ensure no disturbance of buffer/conservation zones. 2. Visual assessment of buffer/conservation areas to ensure no degradation as a result of operations.
Reporting	Keep records of monitoring of buffer and conservation areas, and also on status of rehabilitation areas.
Responsible Person	Environmental Officer is responsible for monthly assessment and visual appraisal of conservation and rehabilitation zones.
Information/ References	*EA (ERM,2009a) – Ecological Assessment* *EP 11 – Heritage Management.*

Title	**EP 15 – Rehabilitation and Final Landscape**
Objectives	To ensure rehabilitation works are implemented progressively to enhance the scenic and environmental quality of the Project Area, increase habitat for wildlife, and utilise suitable areas for agricultural pursuits (i.e. grazing).
Procedures	1. Plant visual tree lined buffers in zones identified specifically to reduce visual impact from two nearby rural residences. 2. Long-term stockpiles to be revegetated with non-invasive grasses. 3. Remove problem weeds or prevent from spreading. 4. Progressively rehabilitate completed 3ha 'work cells'. 5. Doze the face of the completed quarry areas to a workable slope 1 in 1 or benches as required. 6. Use the overburden, loose quarry material and 20% of topsoil to cover the completed quarry area. 7. Rip the material on the contour to prevent erosion in the event of heavy rain. 8. Chisel plough and harrow the ground on the contour to prepare a seedbed. 9. Apply the following organic fertilizers at the following <u>rates per hectare</u>: • Agricultural lime 1000 kg • Gypsum 500 kg • Rock Phosphate (containing micro organisms) 300 kg • Potassium Sulfate 150 kg • Zinc Sulfate 10 kg • Manganese Sulfate 8 kg • Copper Sulfate 4 kg • Boron Sulfate 4 kg • Metal Dust 500 kg 10. Sow the area with a mixture of grasses (i.e. Seteria, Rhodes Grass and Millett or Rye Grass) and legumes, (Wyn Cassia and clovers). Roll with a 'cambridge' corrugated roller on the contour to promote good germination. 11. Within 1-2 weeks the Millet or Rye Grass would be expected to have germinated and commenced holding the soil. The other grasses and legumes take from 4-8 weeks to germinate to a useful size to further cover the area. 12. Keep cattle off the area for approximately 12 months

	The above process aims to ensure the rehabilitation areas can withstand significant rainfall occurrences without erosion. If sandy-loam topsoil alone were used, significant erosion and loss of pasture germination would likely occur in a major rain event.
Monitoring	Monthly inspections of rehabilitation areas by Environmental Officer to assess establishment of vegetation.
Reporting	Document progress of rehabilitation and where applicable provide works as executed plans to demonstrate completed areas of the .
Responsible Person	Environmental Officer is responsible ensuring rehabilitation is undertaken in accordance with rehabilitation schedule and strategy, and documenting progress of same.
Information/ References	*EA (ERM,2009a) – Ecology Assessment, Noise and Visual Assessment.*

Title	**EP 16 – Bushfire Risk Management**
Objectives	To ensue that Champions Quarry effectively manage the risk of damage to life, property and the environment in the event of a bush fire.
Procedures	1. Assess any on-site fuel load every 6 months to maintain as necessary. 2. Undertake hand and mechanical clearing methods for fuel loads on-site or obtain hazard reduction burning permits as deemed necessary. 3. Advise adjoining property owner, RFS Fire Control centre, and NSW Fire Brigade prior to conducting hazard reduction burning. 4. Educate site staff to emergency evacuation of fire fighting procedures.
Monitoring	Assess on-site fuel load every 6 months. Consult adjoining property owners to coordinate maintenance of vegetation and hazard reduction burns if necessary.
Reporting	Document timing and effectiveness of any hazard reduction burns.
Responsible Person	Environmental Officer is responsible for training site staff and for maintenance of fuel loads across the Project Area. Hazard reduction burns to be undertaken by appropriately qualified people.
Information/ References	*Guidelines for Low Intensity Bush Fire Reduction Burning (for Private Landholders) (RFS, 2003)*

Title	**EP 17 – Community Relations**
Objectives	To ensure Champions Quarry effectively manage, minimise and monitor social impacts and communicate with the local community, and key stakeholders (i.e. authorities)
Procedures	Telephone complaints line to be open during operational hours. Telephone number to be permanently advertised on the gate and in the local newspaper during the public consultation period.
Monitoring	Maintain complaints register and respond to justifiable complaints. Regularly consult with local landholders to maintain a working relationship with regard to issues such as fence maintenance and weed control.
Reporting	Summary monitoring report/s to be prepared for relevant authorities as per any licence requirements of conditions of approval.
Responsible Person	Quarry Director to ensure all necessary consultation and reporting is undertaken and where necessary provided to relevant regulatory authorities.
Information/ References	*Complaints Register* (to be prepared post approval)

Title	**EP 18 – Waste Management**
Objectives	To minimise waste generated, maximise reuse and recycling, and ensure wastes are managed appropriately to minimise impacts on the environment.
Procedures	1. Collect recyclable material (waste oil, metal, glass, and plastic) for collection by Council or appropriate recycling contractor. 2. Dispose of non-recyclable domestic waste via council collection service. 3. No building, plant and machinery, or putrescibles wastes to be disposed of on site. Reuse of green waste (shredded) for landscaping purposes. 4. No waste generated off site is to be stored on-site, treated, or processed on-site. 5. Appropriate disposal of any on-site amenities effluent via a pump out system, or via a septic system pending council approval. 6. Waste oil and grease to be collected and stored in a bund 110% the size of the largest container and removed by a licensed contractor. Refuelling to be undertaken in the designated refuelling area at the site office. 7. Encourage staff to adopt waste-reducing practices. 8. Processing plant tailing (silt and fine clays) to be disposed to sediment settling ponds. Material can be excavated and reused on-when at capacity or alternatively sediment dam can be capped and rehabilitated if no longer required.
Monitoring	Monthly inspection of on-site sorting of recyclable via *Site Condition Checklist*.
Reporting	Document waste disposal and recycling to assess any areas for improvement.
Responsible Person	Environmental Officer is responsible for educating staff and monitoring waste disposal and recycling practices. All site staff are responsible correct management and disposal of waste.
Information/ References	*EA (ERM,2009a) – Waste management.* *Assessment and Classification of liquid and Non-Liquid Wastes (EPA, 1999)* *Bunding and Spill Management (EPA Technical Bulletin)*

Annex A

Environmental Plans

Annex A – Environmental Plans - Contents

Title	**EP 1 – Induction and Training**
Objectives	To ensure all persons working at the quarry are aware of their environmental obligations, specific environmental issues and control measures, as well as roles and responsibilities with regard to the environment on-.
Procedures	1. Environmental Induction for all Champions Quarry employees and contractors before starting work. Induction to cover following issues: i. Requirements of the QMP; ii. Specific environmental issues on the Project and control measures; iii. Roles and responsibilities; and iv. Environmental incident procedures. 2. Retraining sessions within one month of changes to relevant sections of the QMP. 3. Retraining sessions within one month to persons identified by *Complaints Register* or *Conditions Checklist* as not conforming to procedures. 4. All truck drivers entering Project Site for the first time to be provided with ' *Induction for Drivers*' form attached.
Monitoring	Status of inductions to be checked regularly (i.e. monthly) using *Condition Checklist*
Reporting	Record of all inductions and retraining, including name and date provided to be retained on-site.
Responsible Person	Production manger responsible for ensuring all persons working on-site are properly inducted and retrained as required.
Information/ References	*Induction for Drivers* form (to be prepared post approval) *Traffic Management Plan* (to be prepared post approval) *Condition Checklist* (to be prepared post approval)

Title	**EP 2 – Environmental Incident Management**
Objectives	To ensure all environmental incidents are promptly and effectively managed to minimise environmental impact.
Definitions	An Environmental Incident is an event that has the potential to harm the environment. Examples are fuel spillage, failure of erosion, or sediment controls, or excessive noise or dust generation.
Procedures	1. Stop action causing incident (i.e. switch off equipment). 2. Stop all work in the immediate vicinity of the incident until advised to continue work by the quarry supervisor – inform nearby workers if required. 3. Notify Champions Quarry Director 4. If there is a fuel spill – block flow paths or install temporary barriers or controls as necessary. Dispose any contaminated spill containment materials to appropriately licensed landfill facility. 5. Production manger to contact NSW DECC's pollution line (131 555) as soon as possible for any incidents causing or threatening harm to the environment. 6. Production manager to ensure incident area is controlled, cleaned up, problem rectified and prevention measures are put in place. 7. Fire extinguishers to be carried by all machinery used. Water cart is to be able to access all relevant areas of the Project .
Monitoring	*Condition Checklist* (to be prepared post development) to be completed monthly.
Reporting	1. Immediately for pollution incident causing or threatening harm to the environment. 2. As required by any licence conditions for exceeding dust of noise limits.
Responsible Person	1. All Champions Quarry staff are responsible for their own actions in preventing incidents occurring, containing spills, etc. 2. Quarry Director is responsible for enquiries into incidents, notification and written reports to regulatory authorities as required, and declaring an area safe after an incident.
Information/ References	**FOR MEDICAL EMERGENCIES AND SAFETY INCIDENTS REFER TO SAFETY MANAGEMENT PLAN** Relevant Licence Conditions (to be completed post approval) *Incident Contact Table* (to be prepared post approval)

Title	**EP 3 – Complaints Management**
Objectives	To ensure any problems brought to the attention of Champions Quarry by the local community and/or relevant authorities are documented and acted upon to avoid re-occurrence.
Procedures	1. Complaints telephone number signposted at front gate on Wyrallah Road and advertised in local newspapers prior to initial commencement of quarry operations. 2. All complaints/concerns raised by local community/relevant authorities to be recorded on *Complaints Register* by Quarry Director. *Complaints Register* to be retained on-site. 3. All complaints to be brought to the attention of the General Manger immediately. 4. Quarry Director to identify and initiate appropriate action in response to complaint and follow-up contact with complainant. 5. Problem/issues to be reviewed.
Monitoring	*1.* All complaints to be recorded on *Complaints Register.* 2. Complaints Register to be checked monthly using *Site Condition Checklist.*
Reporting	1. Summary of complaints reported to authorities if required by Licence condition.
Responsible Person	1. All Champions Quarry staff are responsible for recording telephone complaints on *Complaints Register*. 2. Quarry Director responsible for initiating follow-up action and contact with complainant.
Information/ References	*Complaints Register* (to be prepared post approval)

Title	**EP 4 – Environmental Review and Reporting**
Objectives	To review and report on environmental controls and their effectiveness to assess Project environmental performance and any required improvements.
Procedures	1. Monthly site inspection using *Site Condition Checklist* by Environmental Officer or delegate to check environmental procedures and controls and completion of any environmental requirements. 2. Environmental monitoring results required by relevant procedures to be reviewed by Environmental Officer to evaluate effectiveness of controls. 3. Summary monitoring report/s to be prepared for relevant authorities as per any licence requirements or conditions of approval.
Monitoring	1. Monthly *Site Condition Checklist* to be completed. 2. Various monitoring activities as required as per Environmental Plans
Reporting	Summary monitoring report/s to be prepared for relevant authorities as per any licence requirements of conditions of approval.
Responsible Person	Quarry Director to ensure all necessary reporting is undertaken and where necessary provided to relevant regulatory authorities.
Information/ References	*Complaints Register* (to be prepared post approval)

Title	**EP 5 – Traffic and Transport Management**
Objectives	To minimise the impact of trucks on the local road network, local residents and to comply with approved access and vehicle movements.
Procedures	1. Truck movements to and from the quarry to generally conform to an average of 24 loaded trucks per day leaving the quarry. 2. The operation of the quarry and haulage of material during the following days and operational hours: • Monday to Friday 7.00am to 5.30pm; and • Saturday 7.30am to 3.00pm. 3. All loads must be fully covered before leaving Project Area. 4. Maximum 30km/hr speed limit on all internal haul roads. 5. Wyrallah Road access to be inspected monthly by the Environmental Officer for accumulated sand/clay and maintained as necessary by removing material.
Monitoring	1. All loads to be inspected at weighbridge or loading point to make sure they are covered. 2. Weighbridge dockets or loader/s scale dockets to be retained for a record of the time of daily vehicle movements and volumes of materials leaving the Project Area. 3. Complaints Register to be used to record traffic management complaints. 4. Wyrallah Road access to be inspected monthly by the Environmental Officer for accumulated sand/clay and maintained as necessary by removing material. 5. Monthly inspection of road surface (Wyrallah Road intersection and internal haul roads by Environmental Officer for damage).
Reporting	1. Vehicle movement records to be maintained for reporting if required.
Responsible Person	1. Environmental Officer responsible for inspection of Wyrallah Road intersection and internal haul roads. 2. Truck drivers responsible to comply with permitted hours of operation and site induction requirements.
Information/ References	*EA (ERM, 2009a) – Traffic Report and Induction for Drivers/ Traffic Management Plan*

Title	**EP 6 – Hours of Operation**
Objectives	To ensure all quarrying operations and truck movements comply with the approved hours of operation.
Procedures	The operation of the quarry and haulage of material to only be undertaken during the following days and operational hours: • **Monday to Friday 7.00am to 5.30pm and** • **Saturday 7.30am to 3.00pm** Works not related to extraction, processing and haulage of material – such as equipment maintenance and environmental management – can occur outside of these hours where it is non audible at sensitive receivers.
Monitoring	Certified weighbridge dockets or loader/s scale dockets, and log book or computer records to be kept on-site recording arrival and departure times of vehicles within the quarry operation hours.
Reporting	Vehicle movement records to be maintained for reporting purposes if required.
Responsible Person	1. Weighbridge operator or loader operator/s responsible for accurate vehicle movement record keeping. 2. Truck drivers and Champions Quarry staff responsible to comply with permitted hours of operation.
Information/ References	*EP 5 – Traffic and Transport Management* *EP 12 – Noise and Vibration Management*

Title	**EP 7 – Permissible Extraction Program**
Objectives	To ensure that: • the maximum annual volume of extracted material complies with the approved average extraction limit of 250,000 tonnes per annum. • the extraction sequence complies with the proposed program (i.e. maximum three by 3ha '*work cells'* and depth of extraction).
Procedures	Extraction to be undertaken at the estimated annual stripping rates and in the sequence and to the depths as provided in the EA.
Monitoring	1. Weighbridge dockets or loader/s scale dockets to monitor monthly number and tonnage of loads leaving the Project Area. 2. Survey and Works as Executed plans showing completed extraction areas when necessary. 3. Quarterly monitoring of groundwater levels in on-site monitoring wells and comparison with monthly average rainfall by the Environmental Officer.
Reporting	Statement of compliance as required by approval and licence conditions survey plan showing status of extraction and rehabilitation.
Responsible Person	Environmental Officer to ensure extraction is undertaken as per proposed quarrying plan and site surveys and monitoring are conducted as necessary.
Information/ References	*EA (ERM,2009a) – Description of proposed development.*

Title	**EP 8 –Protection of Adjoining Lands**
Objectives	To minimise impacts of the operation on nearby landuses and sensitive environmental areas such as the Hoop Pine gully.
Procedures	1. The Project Area boundary is to be clearly delineated with pegs and safety wire. 2. Boundaries to sensitive areas to be clearly delineated to ensure site operations do not impact these areas. 3. Rehabilitation areas to be clearly delineated to avoid and manage these areas in order to promote revegetation efforts. 4. Measures will be implemented to ensure public safety and unauthorised access to the Project Area. 5. Bunding will be placed at specific locations to minimise potential visual, noise, and dust emission impacts of the quarrying operations.
Monitoring	6. Monthly inspection of buffer zones to monitor success of buffer markers to ensure no disturbance of buffer/conservation zones.
Reporting	Monthly *Condition Checklist*
Responsible Person	Environmental Officer is responsible for monthly inspection to monitor success of buffer zones protection and rehabilitation efforts.
Information/ References	*EA (ERM,2009a) – Description of proposed development.*

Title	**EP 9 – Water Management**
Objectives	To ensure discharge of stormwater from the Project Area is clear of sediment (<50mg/L Total Suspended Solids) and pH is within adopted range for protection of aquatic ecosystems. To ensure compliance with the *Water Act 1912* and *Protection of the Environment Operation Act 1997*.
Procedures	***Surface Water*** 1. Install and maintain water management structures (diversion contour banks, sediment basins, erosion and sediment controls measures, and main storage dams) as per the *EA* and ERM (2009) *Soil and Water Management Plan (SWMP)*; *Managing Urban Stormwater: Soil and Conservation* (NSW Government, 2004) to contain and treat all rainfall and runoff resulting from a 80th percentile, 5 day rainfall event. 2. Construct clean water diversion for each active quarrying area. 3. Construct appropriately sized sedimentation basins within the excavated quarry floors to comply with design in *SWMP (ERM, 2009)*. 4. Construct main storage dams to capture water for on-site use for processing, dust suppression, etc. 5. Erosion and sediment control works to be installed in accordance with EP 10. 6. Minimise areas of disturbance by only clearing areas immediately prior to extraction and undertaking progressive rehabilitation (EP 15); 7. Where possible, maintenance of equipment and refuelling only to be carried out in designated workshop and refuelling area. 8. Chemical and fuels to be stored in 110% percent capacity bunded areas and fuel and oil spill containment materials to be retained on-site. 9. During rehabilitation constructed diversion contours and sediment ponds to be levelled to surrounding landform and topsoiled and revegetated once appropriate.

	Groundwater 10. Extraction not to occur within two metres of groundwater table (wet weather, high level) based on groundwater monitoring and survey information of the working area of the quarry. 11. In the event of groundwater being breached, operations in the vicinity of the affected area are to cease and authorities are to be consulted with respect to the basis upon which extraction may recommence. 12. Maintain a minimum of two groundwater monitoring bores at or adjacent to the Project Area.
Monitoring	1. During surface water discharge from the water reuse dam and reed beds water monitoring at discharge point daily for TSS, turbidity and pH. 2. Initial quarterly groundwater level monitoring of the monitoring bores on-site to be undertaken and following any periods of extreme wet weather. 3. Groundwater quality monitoring to be undertaken in the monitoring bores every 6 months. 4. Quantity of any extracted groundwater from supply bore (if applicable). 5. Surface water monitoring in Tucki Tucki Creek to be undertaken every 6 months at up-stream and downstream locations to compare to baseline data collected prior to the proposed expansion of the quarry operation.
Reporting	All water quality and monitoring data to be retained on-site and report to authorities as per any Licence requirements or conditions of consent.
Responsible Person	Environmental Officer or person/s authorised by Environmental Officer
Information/ References	*EA (ERM,2009a) - SWMP* *Figure EP 9.1 Groundwater Monitoring Locations* *Figure EP 9.2 Surface Water Management* *Managing Urban Stormwater: Soil and Conservation* (NSW Government, 2004)

Title	**EP 10 – Erosion and Sediment Control**
Objectives	To minimise and manage erosion and sedimentation on the Project Area and ensure that sediment laden runoff is not discharged from the Project Area. To comply with *Managing Urban Stormwater: Soil and Conservation* (NSW Government, 2004)
Procedures	1. Construct all internal all-weather surfaced access tracks with cross-fall, table drains and lead outs with appropriate sediment traps, headwalls and scour protection. 2. Divert dirty runoff and dam water to sediment basins, sediment traps and catch ponds as a primary means of sediment trapping before water is discharged to main storage ponds or off-site. 3. Sediment ponds to have markers in place indicating sediment storage capacity (if known), or 30% of design capacity of the basin. Sediment collected in sediment pond to be removed when design capacity of pond is reduced by 30%. Sediment/silt removed may be applied on-site within rehabilitation areas as a layer no greater than 100mm thick beneath topsoil (immediately prior to spreading of topsoil), or alternatively, removed off-site to landfill/waste recycling facility or on-site sediment dump. 4. Only clear areas immediately prior to extraction and progressively rehabilitate to minimise area of disturbance (see EP 15). 5. Inspect drainage and sediment controls monthly and conduct maintenance as required to ensure effectiveness. Where erosion is observed to be occurring, implement temporary erosion sediment controls (i.e. silt fence), or rehabilitation/stabilisation measures as per *Managing Urban Stormwater: Soils and Construction* (NSW Government, 2004). 6. Topsoil stockpiles to have a maximum depth of 3 metres and are to be sown with vegetation if stored for extended length of time. 7. Implement and maintain silt fence downstream of dam sites and at intersection of the boundary and ephemeral watercourse prior to decommissioning. Fence to be maintained along boundary until rehabilitation of watercourse occurs. 8. Silt traps within quarry floor drainage channel to be designed in accordance with *Managing Urban Stormwater: Soil and Conservation* (NSW Government, 2004) and consist of a gravel filled wire mesh or geotextile 'sausage', or similar, laid perpendicular to the direction of flow. Straw bales should not be used unless they may be securely anchored to the quarry floor.

Monitoring	1. Monthly inspection of all drainage and sediment controls on-site, including water storages, dam walls, outlet structures etc.
Reporting	Refer EP 9
Responsible Person	Environmental Officer or person/s authorised by Environmental Officer
Information/References	*EA (ERM,2009a) - SWMP* *EP 9.1 Groundwater monitoring locations plan.* *EP 9.2 Surface Water management plan* *Managing Urban Stormwater: Soil and Conservation* (NSW Government, 2004)

Title	**EP 11 – Heritage Management**
Objectives	To protect and mange any heritage items and archaeological material found on-site.
Procedures	If any unidentified heritage or archaeological sites are found during operation: 1. any works likely to affect such sites are to cease. 2. the NPWS are to be contacted. 3. necessary permits or consents to be obtained prior to recommencement of work. Burials Protocol Consultation with a local Aboriginal representative during the preparation of the *EA* (ERM, 2009a) indicated that burial sites may be present in the Tuckurimba area. It is however considered unlikely that burial sites would be present within the Project Area due to the shallow nature of the soils overlying the sandstone bedrock. The following Burial Protocol simply puts into place several protocols to be undertaken in the unlikely event of human skeletal material being uncovered on-site including: 1. all works in the immediate vicinity of the burial site should be halted; 2. the police contacted; 3. a Local Aboriginal Representative contacted; 4. if required a suitably qualified archaeologist or physical anthropologist contacted; and 5. once ascertained that the burial is in fact Aboriginal, the local Aboriginal community should be consulted on how best to proceed. Options available may include that the remains be reburied as closely as possible to their original location (i.e. on the proponents farm land) or relocated to another site.
Monitoring	To be documented in the event that materials are found.
Reporting	As above.
Responsible Person	Environmental Officer is responsible for reporting any finds to the DECCW and/or NSW Heritage Office and restricting access to the area.
Information/ References	*EA (ERM,2009a) – Heritage Section*

Title	**EP 12 – Noise and Vibration Management**
Objectives	To ensure that operational noise complies with NSW DECCW regulations.
Sources	Sources include wet and dry *Central* and *Southern* section `processing plant, loading plant, dozer/s, excavator/s, rock saw and jackhammer, water truck, off-site haul trucks and on-site haul truck/s.
Procedures	1. Construct earth bunds as per design specifications contained in EA. 2. Noise emission of any new equipment to be considered prior to purchase. 3. Refer to EP6 for hours of operation. 4. All road surfaces, vehicles and equipment to be regularly maintained to reduce noise. 5. Induction for Drivers to required truck speed limits and the limited use of exhaust brakes where safe.
Monitoring	Establish permanent monitoring points for ongoing compliance monitoring. Undertake operational noise compliance monitoring once quarry is fully operational and earthern and vegetative bunds have been installed.
Reporting	Provision of operational noise monitoring result to authorities if required.
Responsible Person	Environmental Officer to organise monitoring and reporting as required. Truck drivers are responsible for required action to reduce noise.
Information/ References	*EA (ERM,2009a) – Noise Assessment* *EP 6 – Operational hours*

Title	**EP 13 – Air Quality Management**
Objectives	To minimise dust generation and air pollution to prevent impact in surrounding residences and sensitive areas.
Procedures	1. Minimise the area of disturbance by only clearing areas immediately prior to extraction and progressive rehabilitation (see EP 15) 2. Maintain dust depression devices/controls to all processing plant. 3. Long-term topsoil and overburden stockpiles to be planted with a crop cover of non-invasive seasonal grasses. 4. Use water cart to suppress dust on unsealed roads, truck loading areas and stockpiles during dry conditions on days of operation. 5. Maximum 30km/hr on- speed limit to reduce dust generation. 6. All loaded vehicles to be covered before leaving Project Area. 7. Regular maintenance of mobile and fixed plant to minimise exhaust emissions.
Monitoring	Dust deposition monitoring if persistent dust emissions become evident during quarrying operations.
Reporting	Authorities to be contacted as required if allowable dust limit exceeded.
Responsible Person	Environmental Officer is responsible for observing conditions and instigating dust monitoring if deemed necessary. Quarry supervisor responsible for ensuring processing plant dust suppression equipment/controls are in place. Drivers responsible for adherence to speed limits, covering loads, regular plant/vehicle maintenance.
Information/ References	*EA (ERM,2009a) – Air Quality*

Title	**EP 14 – Flora and Fauna Management**
Objectives	To minimise impact on identified significant flora and fauna adjoining the operational Project Area.
Procedures	1. Clearly delineate identified vegetation to be protected (i.e. Hoop Pine gully) and ensure quarrying activities do not impact on such areas. 2. Carry out pre-clearance inspections, flora/fauna translocation, and micro-habitat salvage prior to felling any hollow bearing trees. 3. Progressively rehabilitate extraction areas. 4. Protect any adjoining bushland by maintaining buffer (EP 8). 5. Remove weeds and/or prevent from spreading. Council to be advised of any noxious weeds on-site (list to be obtained from Council and retained on-site). 6. If any unidentified heritage or archaeological sites are found during rehabilitation works, refer to procedures in EP 11.
Monitoring	1. Monthly assessment of buffer markers and fences to ensure no disturbance of buffer/conservation zones. 2. Visual assessment of buffer/conservation areas to ensure no degradation as a result of operations.
Reporting	Keep records of monitoring of buffer and conservation areas, and also on status of rehabilitation areas.
Responsible Person	Environmental Officer is responsible for monthly assessment and visual appraisal of conservation and rehabilitation zones.
Information/ References	*EA (ERM,2009a) – Ecological Assessment* *EP 11 – Heritage Management.*

Title	**EP 15 – Rehabilitation and Final Landscape**
Objectives	To ensure rehabilitation works are implemented progressively to enhance the scenic and environmental quality of the Project Area, increase habitat for wildlife, and utilise suitable areas for agricultural pursuits (i.e. grazing).
Procedures	1. Plant visual tree lined buffers in zones identified specifically to reduce visual impact from two nearby rural residences. 2. Long-term stockpiles to be revegetated with non-invasive grasses. 3. Remove problem weeds or prevent from spreading. 4. Progressively rehabilitate completed 3ha 'work cells'. 5. Doze the face of the completed quarry areas to a workable slope 1 in 1 or benches as required. 6. Use the overburden, loose quarry material and 20% of topsoil to cover the completed quarry area. 7. Rip the material on the contour to prevent erosion in the event of heavy rain. 8. Chisel plough and harrow the ground on the contour to prepare a seedbed. 9. Apply the following organic fertilizers at the following <u>rates per hectare</u>: • Agricultural lime 1000 kg • Gypsum 500 kg • Rock Phosphate (containing micro organisms) 300 kg • Potassium Sulfate 150 kg • Zinc Sulfate 10 kg • Manganese Sulfate 8 kg • Copper Sulfate 4 kg • Boron Sulfate 4 kg • Metal Dust 500 kg 10. Sow the area with a mixture of grasses (i.e. Seteria, Rhodes Grass and Millett or Rye Grass) and legumes, (Wyn Cassia and clovers). Roll with a 'cambridge' corrugated roller on the contour to promote good germination. 11. Within 1-2 weeks the Millet or Rye Grass would be expected to have germinated and commenced holding the soil. The other grasses and legumes take from 4-8 weeks to germinate to a useful size to further cover the area. 12. Keep cattle off the area for approximately 12 months

	The above process aims to ensure the rehabilitation areas can withstand significant rainfall occurrences without erosion. If sandy-loam topsoil alone were used, significant erosion and loss of pasture germination would likely occur in a major rain event.
Monitoring	Monthly inspections of rehabilitation areas by Environmental Officer to assess establishment of vegetation.
Reporting	Document progress of rehabilitation and where applicable provide works as executed plans to demonstrate completed areas of the .
Responsible Person	Environmental Officer is responsible ensuring rehabilitation is undertaken in accordance with rehabilitation schedule and strategy, and documenting progress of same.
Information/ References	*EA (ERM,2009a) – Ecology Assessment, Noise and Visual Assessment.*

Title	**EP 16 – Bushfire Risk Management**
Objectives	To ensue that Champions Quarry effectively manage the risk of damage to life, property and the environment in the event of a bush fire.
Procedures	1. Assess any on-site fuel load every 6 months to maintain as necessary. 2. Undertake hand and mechanical clearing methods for fuel loads on-site or obtain hazard reduction burning permits as deemed necessary. 3. Advise adjoining property owner, RFS Fire Control centre, and NSW Fire Brigade prior to conducting hazard reduction burning. 4. Educate site staff to emergency evacuation of fire fighting procedures.
Monitoring	Assess on-site fuel load every 6 months. Consult adjoining property owners to coordinate maintenance of vegetation and hazard reduction burns if necessary.
Reporting	Document timing and effectiveness of any hazard reduction burns.
Responsible Person	Environmental Officer is responsible for training site staff and for maintenance of fuel loads across the Project Area. Hazard reduction burns to be undertaken by appropriately qualified people.
Information/ References	*Guidelines for Low Intensity Bush Fire Reduction Burning (for Private Landholders) (RFS, 2003)*

Title	**EP 17 – Community Relations**
Objectives	To ensure Champions Quarry effectively manage, minimise and monitor social impacts and communicate with the local community, and key stakeholders (i.e. authorities)
Procedures	Telephone complaints line to be open during operational hours. Telephone number to be permanently advertised on the gate and in the local newspaper during the public consultation period.
Monitoring	Maintain complaints register and respond to justifiable complaints. Regularly consult with local landholders to maintain a working relationship with regard to issues such as fence maintenance and weed control.
Reporting	Summary monitoring report/s to be prepared for relevant authorities as per any licence requirements of conditions of approval.
Responsible Person	Quarry Director to ensure all necessary consultation and reporting is undertaken and where necessary provided to relevant regulatory authorities.
Information/ References	*Complaints Register* (to be prepared post approval)

Title	**EP 18 – Waste Management**
Objectives	To minimise waste generated, maximise reuse and recycling, and ensure wastes are managed appropriately to minimise impacts on the environment.
Procedures	1. Collect recyclable material (waste oil, metal, glass, and plastic) for collection by Council or appropriate recycling contractor. 2. Dispose of non-recyclable domestic waste via council collection service. 3. No building, plant and machinery, or putrescibles wastes to be disposed of on site. Reuse of green waste (shredded) for landscaping purposes. 4. No waste generated off site is to be stored on-site, treated, or processed on-site. 5. Appropriate disposal of any on-site amenities effluent via a pump out system, or via a septic system pending council approval. 6. Waste oil and grease to be collected and stored in a bund 110% the size of the largest container and removed by a licensed contractor. Refuelling to be undertaken in the designated refuelling area at the site office. 7. Encourage staff to adopt waste-reducing practices. 8. Processing plant tailing (silt and fine clays) to be disposed to sediment settling ponds. Material can be excavated and reused on-when at capacity or alternatively sediment dam can be capped and rehabilitated if no longer required.
Monitoring	Monthly inspection of on-site sorting of recyclable via *Site Condition Checklist*.
Reporting	Document waste disposal and recycling to assess any areas for improvement.
Responsible Person	Environmental Officer is responsible for educating staff and monitoring waste disposal and recycling practices. All site staff are responsible correct management and disposal of waste.
Information/ References	*EA (ERM,2009a) – Waste management.* *Assessment and Classification of liquid and Non-Liquid Wastes (EPA, 1999)* *Bunding and Spill Management (EPA Technical Bulletin)*

Annex B

Crushing, Screening And Sand Washing Plant - Proprietary Information

Powerscreen Pegson XA400 Track Jaw Crusher

Advanced Product Search

The ground breaking XA400 is a high performance primary jaw crushing plant that is easy to set-up, versatile and engineered for quarrying, demolition and mining applications that require high production capacities.

Built with a hydraulic setting adjustment system, the X400 system can run at its optimum setting at all times. At the press of a button the jaw size can be altered enabling the size of product to be quickly changed. This system eliminated the need for machine down time, which would result in expensive delays to the operator.

The XA400 also benefits from being designed with an aggressive crushing action and high swing jaw, which encourages material to enter into the crushing chamber. The plant's HFO direct drive system delivers power to the jaw chamber so material is effectively crushed to the required grade. It has been proven that TEREX Pegson's direct drive system is extremely fuel efficient and will achieve substantial savings on fuel consumption and running costs.

Other features include a product conveyor, which can be lowered and elevated hydraulically, increasing accessibility for attending to blockages, clogging and removal of rebar. This conveyor has also been extended in length to produce a higher discharge height for stockpiling material and is available with an optional deflector plate to prolong the life of the belt and help to reduce spillage.

The plant is also equipped with a hydraulic hopper, which is easy to use and has been designed with extended side plates for increased capacity.

Advantages

- High performance jaw crushing plant
- High throughput capacities up to 400mtph
- Aggressive crushing action with high swing jaw
- Very low fuel consumption, typically only 2litres/hour depending on application, due to highly efficient HFO direct drive system
- Hydraulic adjustment of crusher setting
- Excellent under crusher access for the removal of wire with hydraulic tilting conveyor system
- Heavy duty fabricated chassis and track frame
- Hydraulic folding feed hopper, with boltless fixing system
- Optional dirt conveyor, magnet and radio remote control.

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TEREX FINANCIAL SOLUTIONS

Publication No: Track Impactor/Mar/05/Issue: 1

Your Local Authorised BL-Pegson Dealer:

TEREX | PEGSON

Tracked Impactor Range | Quarrying · Contracting · Recycling

MODELS

428 TRAKPACTOR
4242 SR
1412 TRAKPACTOR

TEREX | PEGSON

TRACKED
IMPACTOR RANGE

THE RIGHT CHOICE

Choosing the right crusher for your application is an important decision. At TEREX Pegson we have the field experience and expertise to help you make the right choice. With over 75 years experience in crushing we will ensure your investment will work at its best for you throughout its service life.

In today's market place businesses need to be armed with equipment that can be quickly adapted to suit different applications. At Terex Pegson we have risen to this challenge and produced a range of crushers that can achieve high throughput capacities on hard rock and demolition material. TEREX Pegson's Impactor range is easy to use and offers outstanding performance on quarrying and recycling operations.

428 TRAKPACTOR

DESIGNED TO DELIVER

The 428 Trakpactor is suitable for processing soft to medium strength quarried rock, demolition debris and recyclable materials at up to 360tph.

It can be used as a primary crusher for well broken feed material or alternatively to give increased reduction by operating as a secondary crusher.

This plant has been designed and built for efficient and cost effective processing, features a multi-stage reduction impactor fitted with hydraulic door opening for quick and easy replacement of wear parts, a heavy-duty vibrating grizzly feeder with underscreen option and a 1000mm wide discharge conveyor. The plant can be fitted with a magnetic overband separator for recycling applications.

A wide selection of optional features are available with this machine and include: dirt conveyor, magnet, radio control, grinding path, a range of wire meshes for the underscreen, a refuelling pump and hydraulic water pump.

Advantages

- Well proven high performance impact crusher
- Two aprons and optional grinding path
- Heavy duty chassis and track frame
- Rapid set-up time and ease of transportation
- Two step self-cleaning grizzly
- Fully skirted product conveyor with heavy duty 'rip stop' belt
- Dirt conveyor & magnetic separator available as options
- Dust suppression sprays fitted as standard

CHAIN CURTAIN
Full width single strand chain curtain.

RADIO REMOTE CONTROL - OPTIONAL
This function is available in approved countries to control the tracking function and stop/start the feeder.

HYDRAULIC OPENING
Easy access with a separate pump for hydraulic opening.

Transport Dimensions	
Length:	14.9 m
Width:	2.8m
Height:	3.44m
Weight:	32 tonnes

Technical information for Impactor	
Feed Opening:	1067 x 711mm
Rotor Diameter:	1066mm
Rotor Width:	1066mm
Rotor Speed:	Slow 506rpm Fast 630rpm
No. of Hammers:	4

BLOW BARS
Two full size and two half size high manganese blow bars are fitted as standard.

A 428 Trakpactor working on a construction project producing crushed limestone at 300tph.

Unit Components	
Crusher type:	Terex Pegson 428 Fixed Hammer Impactor
Feeder:	1.08 x 3.8m
Feed Hopper:	Fixed feed hopper
Hopper length:	4m
Hopper width:	2.1m
Capacity:	Up to 3.8m^3
Powerpack:	Caterpillar C-9, 224kW at 1800rpm at sea level.

4242SR

DESIGNED TO PERFORM

The demand for a single crushing and screening unit capable of producing a controlled top size of finished product in closed circuit has led TEREX Pegson to design and manufacture the 4242SR plant containing a host of user-friendly features.

The new 4242SR is based around the acclaimed 428 Trakpactor and comprises a complete crushing, screening and stockpiling unit built on one tracked chassis.

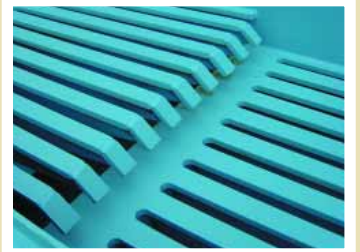
Suitable for primary and secondary applications in quarrying, contracting and recycling, the 4242SR has outstanding performance characteristics, with capacities up to 360 tonnes per hour. Up to four product sizes, depending on the set-up, can be produced and stockpiled. Alternatively, oversize material can be re-circulated back to the crusher via an on-board conveyor to give a guaranteed finished top size.

The unit features a heavy duty vibrating grizzly feeder with two step grizzly, optional under-screen and side conveyor for stockpiling waste material or an additional product. Scalped material is fed onto the main product conveyor via a by-pass chute to increase overall capacity. An overband magnetic separator is available as an option for removal of re-bar and steel when used in recycling applications before the crushed material is fed onto an 3.3 x 1.5mm two deck screen for sizing. To reduce environmental impact, dust suppression sprays are also included as standard.

The whole plant can be set up to work within minutes of arrival on site and, at an approximate operating weight less than 45 tonnes, is easily transportable on a low bed trailer.

Transport Dimensions	
Length:	16.36m
Width:	3.09m
Height:	3.44m
Weight:	44.5 tonnes

Technical information for Impactor	
Feed Opening:	1067 x 711mm
Rotor Diameter:	1066mm
Rotor Width:	1066mm
Rotor Speed:	Slow 506rpm Fast 630rpm
No. of Hammers:	4 fixed type



▲ The 4242SR is shown working in a limestone quarry producing sub-base materials.

◀ **GRIZZLY FEEDER**
The vibrating grizzly feeder incorporates a rubber blanking mat that can be substituted for various aperture wire meshes if required.

▲ **CONVEYOR**
Fines conveyor and screen can be lowered for ease of access and maintenance. Screen can be raised without fines conveyor for additional access.

Advantages

- Combination impactor and screening plant
- Well-proven high performance impact crusher
- Facility to make up to four products
- Two step self-cleaning grizzly with underscreen
- Easy screen access
- Magnetic overband separator optional
- Recirculating facility
- Heavy duty chassis and track frame
- Dust suppression sprays fitted as standard

Unit Components	
Crusher type:	Terex Pegson 428 Fixed Hammer Impactor
Feeder:	1.08 x 3.8m
Feed Hopper:	Fixed feed hopper
Hopper length:	4m
Hopper width:	2.1m
Capacity:	Up to 3.8m^3
Powerpack:	Caterpillar C-9, 230kW at 1800rpm at sea level

1412 TRAKPACTOR

DESIGNED FOR POWER

The 1412 Trakpactor is fitted with a 1.4m wide x 1.2m diameter "state of the art" impact crusher.

This impressive machine has been designed to work in quarry, demolition and contracting environments and can achieve outputs of over 500tph.

A particular feature of this crusher is the hydraulic apron locking facility including overload protection. This provides consistent product size with less oversize than conventional spring loaded impact crushers as well as additional protection against tramp metal. It has also been designed so the crusher opens and adjusts hydraulically and is fitted with a hydraulic tilting feed plate to improve blockage clearance.

This plant is fitted with a modular product conveyor mounted on hydraulic cylinders that can be quickly lowered for access for maintenance and removal of wire on recycling applications.

The 1412 impactor also incorporates the latest PLC control system with minimal wiring, which gives sequenced single push button starting and stopping facility.

Advantages

- Well proven high performance impact crusher
- 1200mm wide discharge conveyor which can be raised and lowered hydraulically for maintenance and transport
- Hydraulic folding hopper with wedgelock system.
- Two way dirt chute
- Hinged drive guard design for belt access
- Magnetic overband separator - optional
- Dirt conveyor - optional
- Crusher performance changes made simply by adjusting engine speed on throttle
- Optional feed hopper for loading shovel feed from rear
- Dust suppression sprays fitted as standard

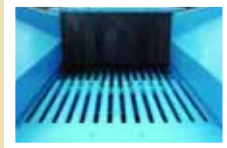
CONVEYOR
Hydraulic raise and lower facility on conveyor.

Transport Dimensions	
Length:	16.9m
Width:	2.8m
Height:	3.75m
Weight:	47 tonnes

Technical information for Impactor	
Feed Opening:	810 x 1360mm
Maximum Feed Size: 600 x 500 x 500mm or slabs: 1200 x 1000 x 250mm	
Rotor Diameter:	1200mm
Rotor Width:	1340mm
Rotor Tip Speed:	34 - 44 m/s
No. of Hammers:	4 fixed type

REMOTE CONTROL – OPTIONAL
This facility is only available in certain countries for operating the tracking function, starting/ stopping the grizzly feeder, and shutting down the plant.

GRIZZLY FEEDER
A spring mounted vibrating grizzly feeder with underscreen uses twin heavy-duty cast eccentric shafts to separate fines.



A 1412 Trakpactor producing sub-base material at 550tph.

Unit Components	
Crusher type:	1412 Fixed Hammer Impactor
Feeder:	1.38 x 4.2m
Feed Hopper:	Hydraulic folding hopper with wedgelock system
Hopper Length:	4.4m
Hopper Width:	2.7m
Capacity:	6.6m^3
Powerpack:	Caterpillar C-12, 326kW at 1800-2100rpm at sea level

SETTING THE STANDARD

TEREX Pegson's combination crushing plants are the bench mark for operators who require high performance tracked crushers.

TEREX Pegson equipment is designed to operate in multi stage operations to provide a complete crushing and screening train.

AFTER SALES

Our dealers are committed to supporting every aspect of your operation from supplying products and spare parts to commissioning and servicing equipment. Their expertise will help you to improve productivity and lower operating costs throughout the working life of your machine.

PARTS

At TEREX Pegson we know the right parts can make the difference to the efficiency and performance of your equipment so when you buy TEREX Pegson parts you are can expect:

- Availability
- Competitive prices
- Warranty compliance
- Fast delivery
- Specification compliance

FINANCIAL SOLUTIONS

TEREX Financial Solutions simplify capital equipment purchase by offering finance arrangements and customised payment plans to suit your business requirements. (Available subject to status and location.)

WARRANTY

Subject to our sales terms and conditions all new TEREX Pegson crushing plants carry a 12 month warranty.

1165 Premiertrak feeding into a 428 Trakpactor in a limestone quarry.

1412 Trakpactor feeding a Powerscreen Chieftain on a recycling application

1165 Premiertrak feeding into a 428 Trakpactor feeding into a Powerscreen Chieftain in a quarrying application.

1412 Trakpactor feeding a Powerscreen 2400 Chieftain producing four grades of material.

1180 Premiertrak working with a 4242SR to produce sub-base.

Powerscreen Chieftain 2100 Track Screen

Advanced Product Search

The new Chieftain 2100 has replaced the popular Chieftain 1800 model and has many additional features which significantly increase productivity. The screenbox is 25% bigger than a standard Chieftain 1800 and the conveyor length has been increased by 2m (9'5") giving increased stockpile heights.

Output Potential: up to 600 tph (661 US tph) *

Features:

- Hydraulic screen tensioning
- Hydraulic screen angle adjustment
- Radio controlled tipping grid
- Oil bath 2-bearing screen box
- Hydraulic folding side conveyors
- Screen walkway and access ladder
- Engine protection shutdown system
- 4th conveyor attaches for transport
- Fully CE approved

Options:

- 2 deck or 3 deck
- Radio controlled tracks
- Single and double deck vibrating grizzly
- Wheel bogie option for transport
- 5th wheel mobile
- 12 or 14ft (3.6m x 4.3m) hopper
- TUV Compliance

*Depending on mesh sizes and material

Chieftain 2100 – 3-Deck with 12ft hopper	Track	
Weight	33,080kgs	71,676lbs
Transport width	2.0m	9'5"
Transport length	17.258m	56'7"
Transport height	3.45m	11'4"
Working width	18.245m	59'10"
Working length	18.505m	60'9"
Working height	5.695m	18'8"

Click to read case studies:

CHIEFTAIN 2100 3 DECK - LIMESTONE APPLICATION

CHIEFTAIN 2100 3 DECK - AGGREGATES & ROAD BASE MATERIALS

Next Steps:

Find a Dealer
Financing

I would like more information about:

- Sales - Contact me regarding this product
- Contact me about equipment financing
- Notify me of updates to this product

user@domain.com
Send

For More Information

Powerscreen International Distribution Ltd
Phone: +44 (0) 28 87 740701
Fax: +44 (0) 28 87 747231
www.powerscreen.co.uk
Email

150E HYDRASANDER

150E HYDRASANDER

Dimensions

Length	8.56m (28' 1")
Width	2.27m (7' 5")
Height	3.41m (11' 2")

Weight: Unladen- 7.5 Tonnes Working- 21.6 Tonnes

Bucket Wheel

Bucket Wheel Diameter:	3353mm - 11' 0"
Number of Buckets:	48 off
Bucket Width:	610mm- 2' 0"
Operating Bucket speed :	0.25 - 1.5 RPM

Spiral conveyor

Spiral Diameter:	2134mm - 7' 0"
Spiral Length:	4572mm- 15' 0"
Operating Spiral Speed:	0.5 - 3.5 RPM

Hydraulics

Max. Hydraulic Pressure:	Bucket - 93 Bar - 1350 PSI
	Spiral - 124 Bar - 1800 PSI
Max. Hydraulic Oil Flow:	Bucket - 23 Litres/Min (5 Gal/Min)
	Spiral - 23 Litres/Mind (5 Gal/Min)
Hydraulic Oil Capacity:	253 Litres - 56 Gallon

Capacities

Holding Capacity:	14,074 Litres (3,100 gallons)
Output Capacity:	60- 120 TPH, depending on application

Water Requirement

1820- 3640L/min (400 - 800 GPM)

Powerunit

7.5kW Electric Hydraulic Unit

Pump: Tandem1PL052/ 1PL052 CTD

Options

Hydraulic coupled model (driven from another machine)

Sand/water single troughing 355 x 178mm

Rubber lined sand/water troughing

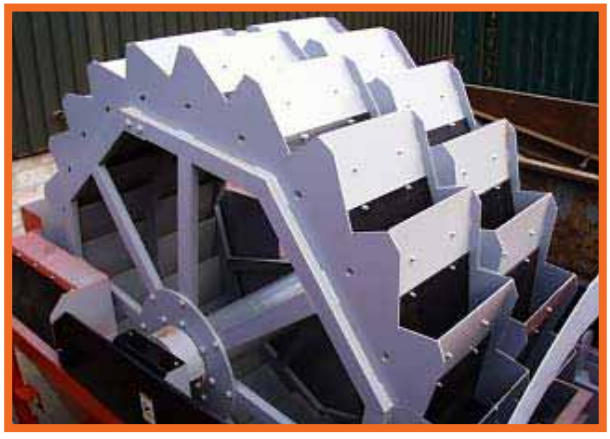
Rubber / Steel lined discharge chutes

300mm high steel support stands

1.5 -2.0M high support structure c/w walk-way, handrail kick board and access ladder

Features

⇒ The Bucket Wheel carries 48 buckets. Each bucket is fitted with a mesh with perforations sized according to application. Bucket Meshes are bolted within the buckets and are replaceable when meshes are worn or interchangeable to suit different applications.



Bucket Wheel

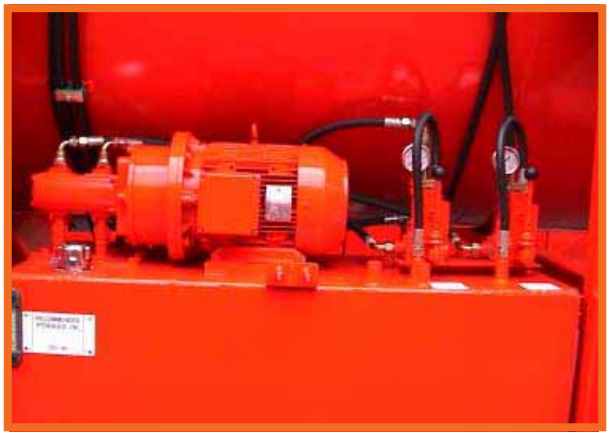
⇒ The Contraflow Spiral is fitted in the 'calm' area of the tank. This spiral plays a very important role when the product to be dewatered contains a high percentage of finer or lower density particles. Depending on the water flow rate a certain percentage of bottom fines can escape first pass recovery and they are then influenced by the water flow along the settlement tank and into contact with the spiral blades - these blades have a contraflow influence nudging the escaping fines back into the recovery buckets.

Contraflow Spiral

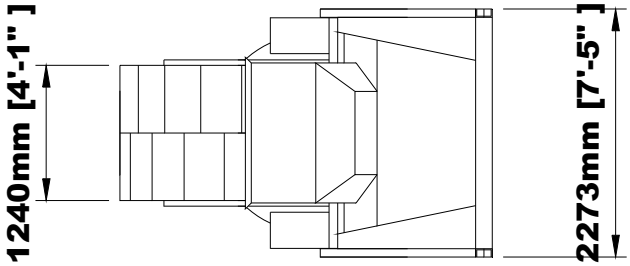
⇒ A series of Weirs incorporated at the rear end of the machine. These weirs control the amount of fines that are allowed to go to waste via the waste water outlet. The weirs operate on the principle that controlled water flow over the weirs stop the fines travelling over the weir thus allowing them to settle in the 'calm' area of the tank where they come into contact with the spiral blade which nudges the fines back into the recovery buckets.

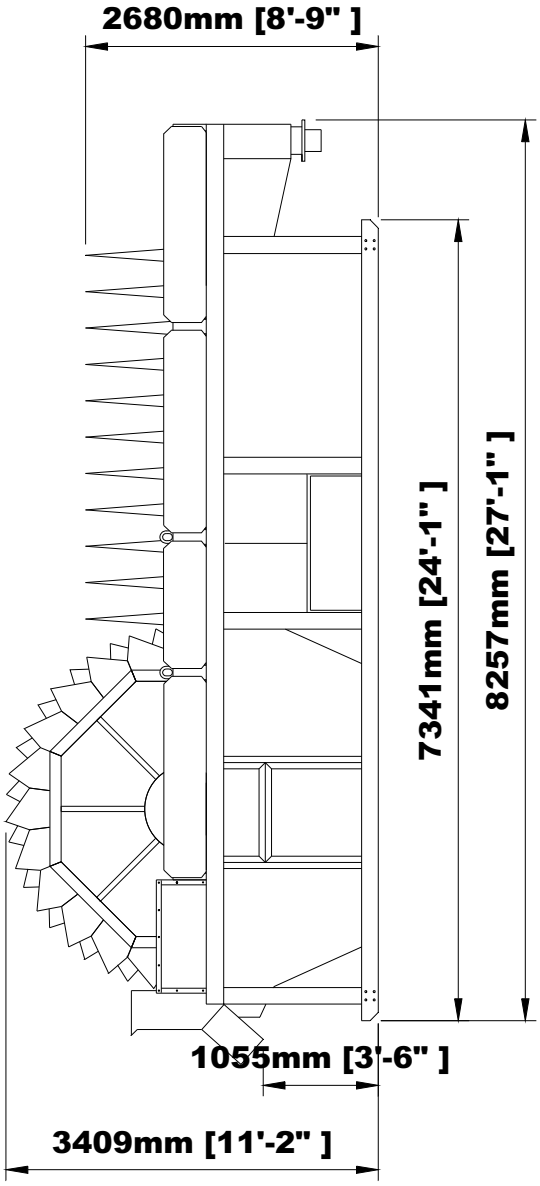
Weirs

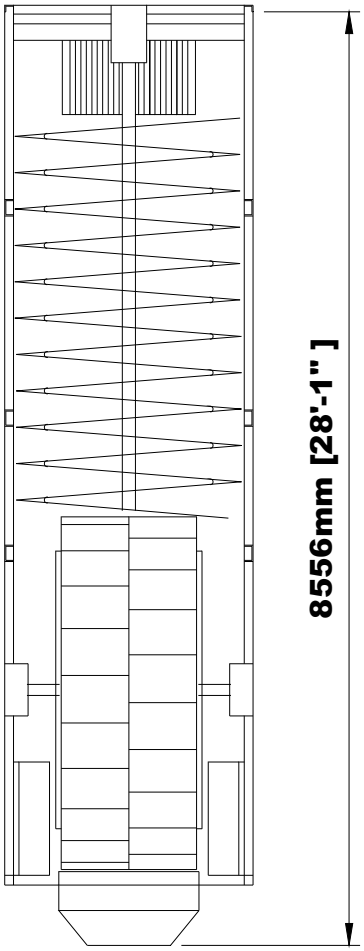
⇒ The 150E Hydrasander is fitted with an Electric/Hydraulic Powerpack powered by an 7.5 kW Electric motor coupled to a Hydraulic Tandem pumps.The Bucket Wheel and Contraflow Spiral control banks are located on top of the hydraulic tank and are easily accessible via a set off hinged doors. On each of the control banks are variable speed controls to allow the operator to 'tune' the machine to suit his requirements.



Control Panel


1240mm [4'-1"]
2273mm [7'-5"]


2680mm [8'-9"]
7341mm [24'-1"]
8257mm [27'-1"]
1055mm [3'-6"]
3409mm [11'-2"]


8556mm [28'-1"]