Part A
The Proposal

1 INTRODUCTION

1.1 GENERAL

Reavill Farm Pty Ltd and Tucki Hills Pty Ltd (the Proponent) seeks approval for the expansion of sandstone quarry operations at Champions Quarry on the New South Wales Far North Coast.

Champions Quarry is located on Wyrallah Road, Tuckurimba, approximately 16km south of Lismore. It is within the Lismore City Council Local Government Area (LGA) in the Far North Coast region of New South Wales (NSW). The land subject to this Major Project application occupies an area of approximately 187ha (*Project Site*) within a total rural holding owned by the proponent of approximately 360ha. A locality map is presented as *Figure 1.1*.

A sandstone quarry has been in operation on the site since 1959, with the present operations taking place in accordance with an approval granted by Lismore City Council (Council DA No. 2005/999) allowing for extraction up to 29,000m^3 (approximately 64,000 tonnes) of sandstone material per annum over a period of up to 15 years. The area of land presently disturbed by the quarry is in the order of 2ha.

It has been established that a regionally significant amount, up to 12 million tonnes, of quality sandstone material exists in an area on the *Project Site* in the vicinity of the existing quarry. In order to increase extraction limits and area, project approval is being sought under the provisions of Part 3A of the *Environmental Planning and Assessment Act 1979* (*EP&A Act*). Project components requiring approval include:

- the expansion of approved resource extraction and processing area to approximately 16ha to allow access to approximately 6.25 million tonnes of sandstone material over 25 years;
- an increase in approved annual extraction rate to 250,000 tonnes per annum;
- processing and stockpiling of extracted materials;
- associated quarry infrastructure such as weighbridge, office, amenities and storage facilities; and
- boundary adjustment of the 6 existing rural allotments to create a single quarry allotment of approximately 38.02ha, and 4 rural allotments.

The area subject to disturbance due to extraction, stockpiling and associated quarry infrastructure is in the order of 16ha and is described as the *Project Area*. This is shown within *Figure 1.2*.

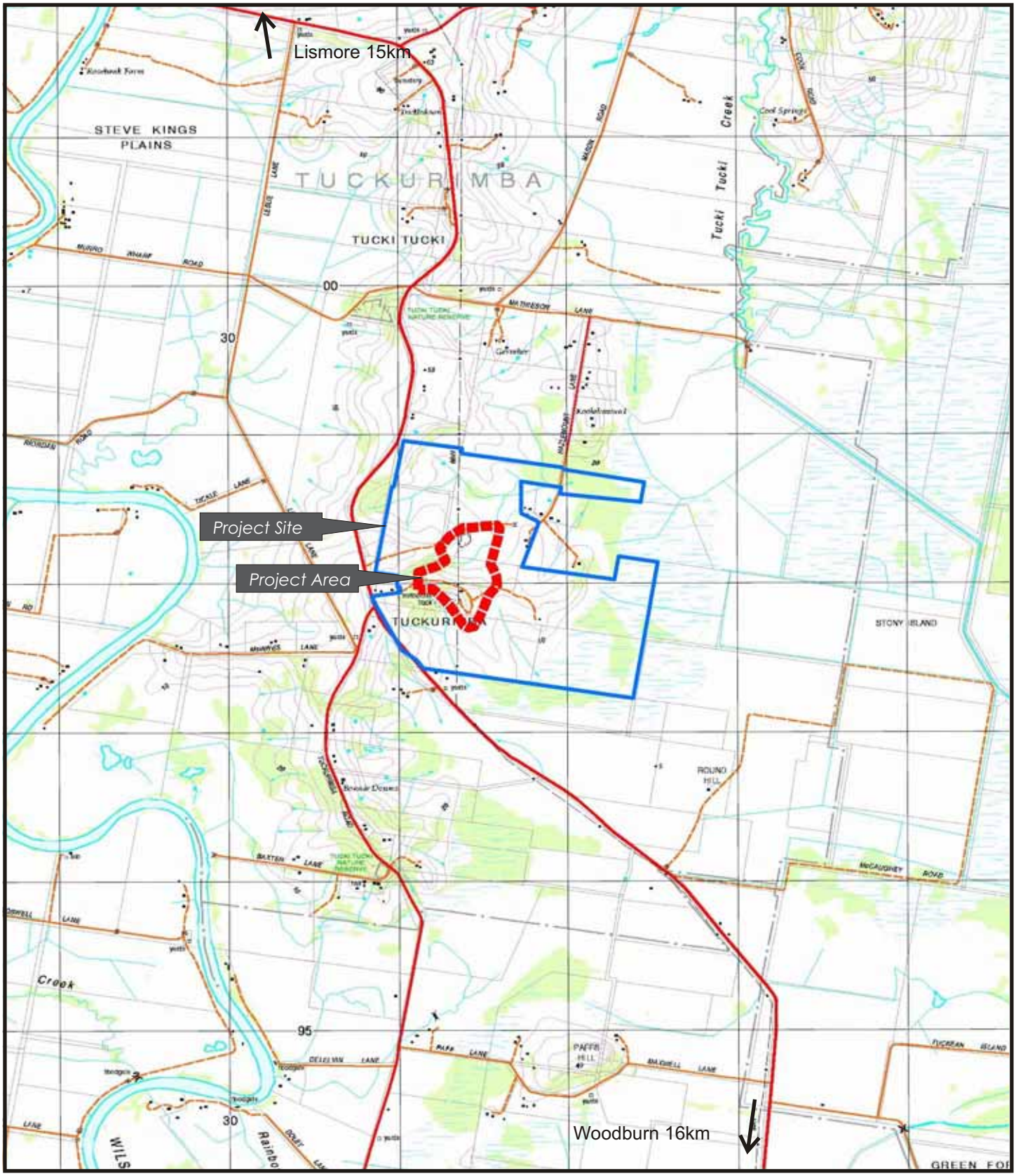

Figure 1.1

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		

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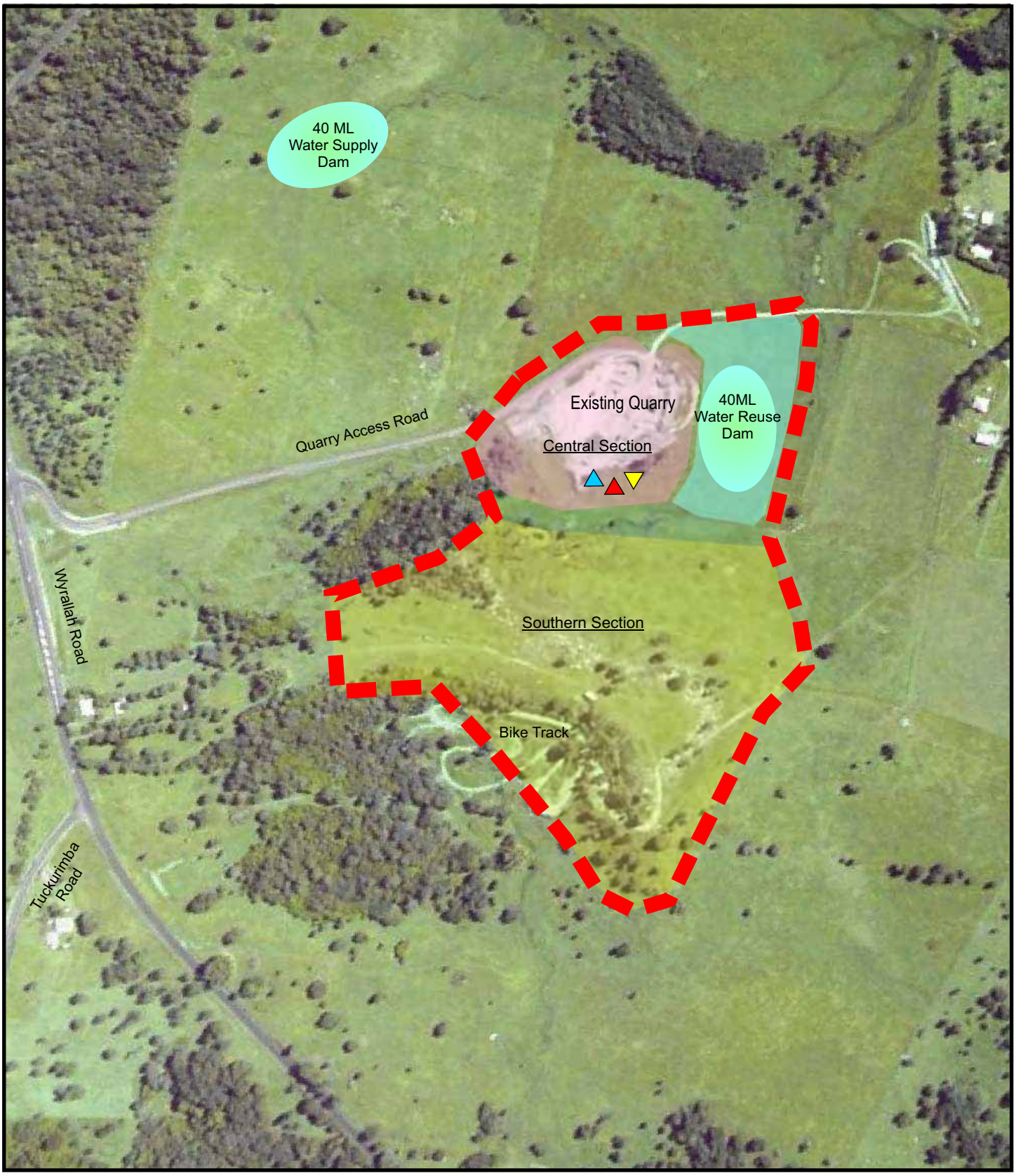

Legend

- 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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The existing Champions Quarry is a small scale operation, which nevertheless provides an important sandstone resource to the Far North Coast Region of New South Wales (NSW). It is however currently restricted by area, processing floor space, absence of a development consent for a sand washing plant, and hence any economy of scale. The proposed expansion of Champions Quarry will provide for access to a substantial quantity of the important sandstone resource which occurs on the property, thus providing for a long term viable and commercially sustainable option for the supply of sand and sandstone products to the Lismore Ballina region.

1.2 SITE LOCATION

Champions Quarry is located approximately 16 kilometres to the south of Lismore, on Wyrallah Road. Access to the site is via a quarry road from Wyrallah Road. Lots directly associated with the quarry, utilised for the access road, material extraction and processing or directly adjoining the lot containing the quarry are:

- 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 total area of these lots owned by the proponent in and around the quarry is 188.18 hectares (ha). The location of the quarry and existing lot layout is illustrated within *Figure 1.1* and *Figure 1.3* respectively.

Champions Quarry is located on the slope of a large ridge (up to 50m AHD). The existing quarry has a disturbed area of approximately two hectares with a floor level of between 10m and 12m AHD. The face of the quarry is up to nine metres high at 25m AHD. There is an internal gravel haulage road within the site leading to the quarry floor.

The land surrounding the quarry is used primarily for rural purposes including cattle grazing, pasture production, as well as some cropping. There are also a number of rural dwellings on smaller allotments within close proximity to the quarry, the nearest being 380 metres from the existing quarry, as shown within *Figure 1.4*

The distance between the existing active quarry area and identified sensitive receivers is detailed below:

- Sensitive Receiver 1 – 810m;
- Sensitive Receiver 2 – 380m;
- Sensitive Receiver 3 – 630m;
- Sensitive Receiver 4 – 500m; and
- Sensitive Receiver 5 – 440m.

It is noted that Sensitive Receiver's two and five are located in close proximity to one another at the end of Hazlemount Lane. For the purposes of specialist impact assessments Sensitive Receiver 2 has been utilised in modelling of noise and air quality as it is closer to the quarry.

Legend

PROPOSED LOT BOUNDARY

Figure 1.3

Existing Lot Layout

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287pm_F1.3		
Date:	25/08/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	Dept of LPMA		
Scale:	Refer to Scale Bar		

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Legend

Sensitive Receptor Location

Extent of Quarry Extraction and Operations (Project Area)

Figure 1.4

Sensitive Receptor Locations

Client:	Champions Quarry	
Project:	Champions Quarry Expansion	
Drawing No:	0098287pm_GIS_EA_F1.4	
Date:	25/08/2009	Drawing size: A4
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1.3 OUTLINE OF THE PROPOSAL

1.3.1 Quarry Expansion

The existing 2006 quarry consent (Lismore City Council DA No. 2005/999) limits extraction 29,000m^3 per annum. This equates to approximately 64,000 tonnes of in–situ material per annum. This consent provided that up to 130,000m^3 (approximately 286,000 tonnes) could be extracted over a period of 15 years, or whichever figure was reached first.

Resource and geological assessment of the *Project Site* has established that up to 12 million tonnes of sandstone material exist (Coffey Geotechnics, 2007). Property adjoining the *Project Site* (also owned by the Proponent) has not been assessed and potentially contains other significant reserves.

Project approval is being sought to gain access to approximately 6.25 million tonnes of resources at a rate of 250,000 tonnes per annum, for a period of 25 years, within the *Project Area*. This is provided for by a continuation of quarrying within the existing pit (herein known as the *Central Section*) to extract 250,000 tonnes, with the remainder to be won within a new pit to be established to the south (herein known as the *Southern Section*).

Given the 'soft' nature of the resource, quarrying will be extracted by excavators and/or dozers without the need to undertake blasting. A rock saw and/or nitrogen fed jackhammer may occasionally be utilised to assist of the extraction of dimensioned sandstone. Quarrying will involve the following main stages:

- extraction within the *Central Section* to take place between 8m AHD and 10m AHD;
- commencement of quarrying within the *Southern Section* commencing with topsoil and overburden removal.
- quarry plans provide for up to three active extraction cells of up to 3ha each within *the Southern Section*;
- processing of materials through screening, washing, scalping and stockpiling, and some campaign based crushing; and
- loading, transport and distribution.

The thin layer of soil and overburden on-site will be stripped off the active extraction cells and used for bunds, rehabilitation or sold on.

Upon completion of quarrying within the *Central Section*, this will be utilised as a bunded processing area for sand washing, materials processing, stockpiling and other related quarry infrastructure.

All despatched material from the quarry will be transported by road.

1.3.2 Boundary Adjustment

It is proposed to undertake a boundary adjustment of the six affected lots owned by the Proponent such that the quarry expansion is able to be accommodated within a single lot with four remaining lots. *Figure 1.5* shows the proposed new lot layout.

Figure 1.5

Proposed Lot Boundaries - Operational Zone Area

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287pm_F1.5		
Date:	20/08/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	TN
Source:	Land Partners 20/08/09		
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1.4 REAVILL FARM PTY LTD AND TUCKI HILLS PTY LTD

Reavill Farm Pty Ltd was formed by Jeff and Diana Champion as a family company in 1979 which, along with Tucki Hills Pty Ltd (another family company) forms parts of the Champion Family Group of Companies. Reavill Farm Pty Ltd has established and operated a number of rural and regional businesses, including quarrying, firstly within the Hawkesbury Valley and, since 1983, in the Lismore/Ballina Region. Two generations of the family are now involved in the day to day running of the businesses.

Tucki Hills Pty Ltd acts as trustee for four family trusts involving three generations of the Champion family. The company and trusts were formed to purchase land for the ongoing development and expansion of its rural and quarry interests in the Tucki Tucki area.

The Champion Group has a continued commitment to sustainable development principles in relation to businesses in general, and to agriculture and quarrying in particular. This commitment has also extended to non profit environmental projects and community service over many years. The quarry operations, which trade as Champions Quarry, has planned expansion based on industry best practice with a significant environmental commitment, as confirmed by the Champions Quarry logo "Working with the Environment".

The success of the Champion Family Group of Companies over the past 40 years and their faith in the future can be summarised by its motto "Vision, Passion and Commitment".

1.5 PROJECT OBJECTIVES

The objectives of the proposed development are to:

- increase the approved production of Champions Quarry from 64,000 tonnes per annum to a maximum of 250,000 tonnes per annum over a 25 year life to allow for access to a resource of 6.25 million tonnes;
- allow for the use of sand washing plant, processing and screening plant in the floor of the *Central Section*;
- provide for a reliable long term source of construction sandstone to the North Coast region;
- provide access to part of the overall resource in a manner that meets industry best practice in terms of environmental performance and community relations, whilst maximizing future expansion opportunities; and

- contribute to local and regional economies through provision of employment, capital expenditure and the supply of vital road construction materials to Pacific Highway upgrade and other construction projects in the area.

1.6 *ENVIRONMENTAL ASSESSMENT STRUCTURE AND FUNCTIONS*

This Environmental Assessment (EA) has been undertaken to assess the significance of the potential environmental impacts associated with the expansion and operation of Champions Quarry. The EA has been undertaken in accordance with the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environmental Planning and Assessment Regulations 2000* (EP&A Regs).

The Champions Quarry expansion has been identified as a 'Major Project' in Clause 75(b), Part 3(A) of the EP&A Act. This EA has been prepared in accordance with the requirements of State Environmental Planning Policy – Major Projects (SEPP-MP) 2005, the Director General of the Department of Planning (DoP) environmental assessment requirements (EARs) and issues raised by relevant government agencies, non government organisations and the community.

The EA has been based on the Director Generals EARs prepared by the DoP in conjunction with a range of other government agencies. EAR's for the project were issued on 22 June 2009. *Table 1.1* below provides a summary of the EARs and identified where each requirement is addressed within this EA report. A copy of the EARs is provided as *Appendix A*.

Table 1.1 Environmental Assessment Requirements

Issue	**The Environmental Assessment must include:**	Where Addressed within the EA Report
General Requirements	An executive summary;	See front of document
	A detailed description of: • existing operations on-site; • existing statutory approvals that apply to these operations; and ❑ the existing environmental management and monitoring regime on the site	Chapter 2
	A detailed description of the proposal including the: • need for the proposal; • nature and quantity of the resource • alternatives considered • likely interactions between existing and approved quarry operations; and likely staging of the project	Chapter 2 Chapter13 Chapter 18

	Risk assessment of the potential environmental impacts of the project, identifying the key issues for further assessment;	Chapter5
	A detailed assessment of the key issues specified below, and any other significant issues identified in the risk assessment (see above) which includes: • a description of the existing environment, using sufficient baseline data; • an assessment of the potential impacts of all stages of the project, including any cumulative impacts associated with the concurrent operation of the project with any other existing or approved quarry operations in the region, taking into consideration any relevant policies, guidelines, plans and statutory provisions; and a description of the measures that would be implemented to avoid, minimize, and if necessary offset the potential impacts of the project, including detailed contingency plans for managing any significant risks to the environment	Chapter 2 Chapter 17 Additional baseline environmental data, impact assessment and mitigation measures is contained within the various specialist impact assessments contained within the report.
	A statement of commitments, outlining all the proposed environmental management and monitoring measures;	Chapter 17
	A conclusion justifying the project on economic, social and environmental grounds, taking into consideration whether the project is consistent with the grounds of the Environmental Planning and Assessment Act 1979; and	Chapter 18
	A signed statement from the author of the Environmental Assessment certifying that the information contained within the document is neither false nor misleading	See front of document
Key Issues	**Noise/Vibrations including:** • an assessment of construction noise, operational noise and off – site road noise and • an assessment of potential vibration impacts	Chapter 9 and Appendix D.
	Air Quality	Chapter 10 and Appendix E
	Transport – including: • a detailed assessment of the potential impacts of traffic from the proposal on the safety and efficiency of the road	Chapter 6 and Appendix F

	network; and • a detailed description of the measures that would be implemented to upgrade and/or maintain roads over the life of the project.	
	Biodiversity – including: • accurate prediction of any vegetation clearing on the site; • a detailed assessment of the potential impacts of the project on any threatened species, populations, ecological communities or their habitats; and • a detailed description of the measures that would be implemented to maintain or improve the biodiversity values of the surrounding region in the medium to long term	Chapter 7 and Appendix C
	Water and Soil – including: • a site water balance for the project; • detailed assessment of erosion and sedimentation impacts; • accurate predictions of the impacts of the project on local waterways, aquifers and local users of surface/groundwater; and\ • final void water management	Chapter 8 and Appendix I
	Rehabilitation – including a detailed description of the proposed rehabilitation strategy for the quarry, taking into consideration any relevant strategic land use planning or resource management plans or policies.	Chapter 16 and Appendix G
	Visual – including consideration of the impacts to rural amenity and the prescribed buffer areas for extractive industries in the Lismore City Council Development Control Plan;	Chapter 14 and Appendix K
	Social and Economic	Chapter 13
	Heritage – both Aboriginal and non – Aboriginal.	Chapter 11
References	The environmental assessment of the key issues listed above must take into account relevant guidelines, policies and plans. While not exhaustive, the following attachment contains a list of some of the guidelines, policies, and plans that may be relevant to the environmental assessment of this project.	

Consultation	During the preparation of the Environmental Assessment, you should consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups or affected landowners: • Department of Environment and Climate Change; • Department of Primary Industries; • Department of Water and Energy; • Roads and Traffic Authority; and • Lismore City Council The consultation process, and the issues raised during this process, must be described in the Environmental Assessment.	Chapter 4

1.7 ENVIRONMENTAL ASSESSMENT REPORT STRUCTURE

This EA contains two volumes incorporating the main text of the EA within *Volume 1*, with appendices and specialist technical studies in *Volume 2*.

Volume 1 is divided into a number of Parts including:

Executive Summary

The executive summary provides a brief overview of the project, key environmental issues and assessment results, and an outline of environmental management procedures.

Part A - The Proposal

Part A contains two chapters, one provides an introduction to the development and the other presents a detailed description of the proposal.

Part B - Planning Framework, Consultation and Issues Identification

Part B contains three chapters; the first provides a description of the legislative considerations and approval requirements for the proposed development, the second presents an outline of the issues identification process, documents government and community considerations and presents a risk assessment used to develop the scope of environmental assessment.

Part C - Environmental Interactions

Part C contains 10 chapters; it describes the interactions between the proposed quarry and the biophysical and social environment. It provides an assessment of the potential environmental impacts associated with the proposal and describes the mitigation measures, which form a part of the proposal to control the environmental impacts as described.

Part D – Environmental Management and Project Justification

Part D provides an outline of the environmental management procedures and environmental mitigation measures to be adopted as a part of the proposal and provides the justification for the proposal. A statement of commitments is also included.

1.7.1 Technical Investigations

The preparation of the environmental assessment has involved input from a range of disciplines, including noise, air quality, Aboriginal heritage, geotechnical, ecological, traffic engineering and planning.

A number of supporting technical reports are submitted as part of this EA. These reports investigate the environmental implications of the project and provide mitigation and management measures and are provided as *Appendix B* to *Appendix L* in *Volume 2*. These reports are:

- *Champions Quarry – Material Assessment of Proposed Expansion Area*, February 2007, prepared by Coffey Geotechnics (Coffey). Refer to *Appendix B*;
- *Proposed Quarry Expansion – 1586 Wyrallah Road Tuckarimba: Ecological Assessment,* November 2009, prepared by Environmental Resources Management (ERM). Refer to *Appendix C*;
- *Champions Quarry – Noise Assessment*, November 2009, prepared by Environmental Resources Management (ERM). Refer to *Appendix D*;
- *Champions Quarry- Air Quality Assessment,* August 2009, prepared by Environmental Resources Management (ERM). Refer to *Appendix E*;
- *Traffic Impact Study – Proposed Expansion of Champions Quarry Operations,* August 2009, prepared by RoadNet. Refer to *Appendix F*;
- *Heritage Assessment of Champions Quarry – Tuckurimba via Lismore NSW,* April 2008, prepared by Everick Heritage Consultants. Refer to *Appendix H*;
- *Aboriginal Cultural Heritage Community Consultation for Champions Quarry*, November 2009, prepared by Environmental Resources Management (ERM). Refer to *Appendix G*;

- *Champions Quarry, 1586 Wyrallah Road – Soil and Water Management Plan,* November 2009, prepared by Environmental Resources Management (ERM). Refer to *Appendix I*;

- *Champions Quarry – Preliminary Quarry Management Plan*, November 2009, prepared by Environmental Resources Management (ERM). Refer to *Appendix J*; and

- *Champions Quarry – Landscape Visual Impact Assessment*, November 2009, prepared by Environmental Resources Management (ERM). Refer to *Appendix K.*

- *Champions Quarry Marketing Assessment,* August 2009, prepared by AVKO Mining. Refer to *Appendix L.*

2 THE PROPOSAL

2.1 PROJECT LOCATION

2.1.1 Project Site

Champions Quarry is located on land owned by Reavill Farm Pty Ltd and Tucki Hills Pty Ltd (the Proponent). The site is located on Wyrallah Road within the rural area known as Tuckurimba, which is approximately 16km south of Lismore.

Access to the existing quarry on the property is gained via a newly constructed intersection with Wyrallah Road (refer *Plate 3*) and sealed to the property boundary, with the remainder by an internal gravel road. The *Project Site* subject of this application has an area of approximately 187ha within a larger holding owned by the proponent. The existing quarry has a floor (pit) area of approximately 1.5ha, with ancillary processing plant and facilities located adjacent to this pit, for a total area of two hectares.

The Champions Quarry expansion area includes a small scale expansion of the existing quarry pit (refer *Plate 1* below), and the creation of a new extraction area to the south. The ultimate area for quarrying activities is in the order of 16ha.

Plate 1 – Existing quarry (Champions Quarry)

2.1.2 *Project Site Description*

The topography and hydrographical features of the site are shown within *Figure 2.1* and *Figure 2.2*. The topography of the site is dominated by the following features:

- the natural hill slopes of a primary ridgeline system running north to south from Lismore between the Wilsons River, to the west and low lying flood plain to east; and
- two smaller ridges running east to west from the primary ridgeline system.

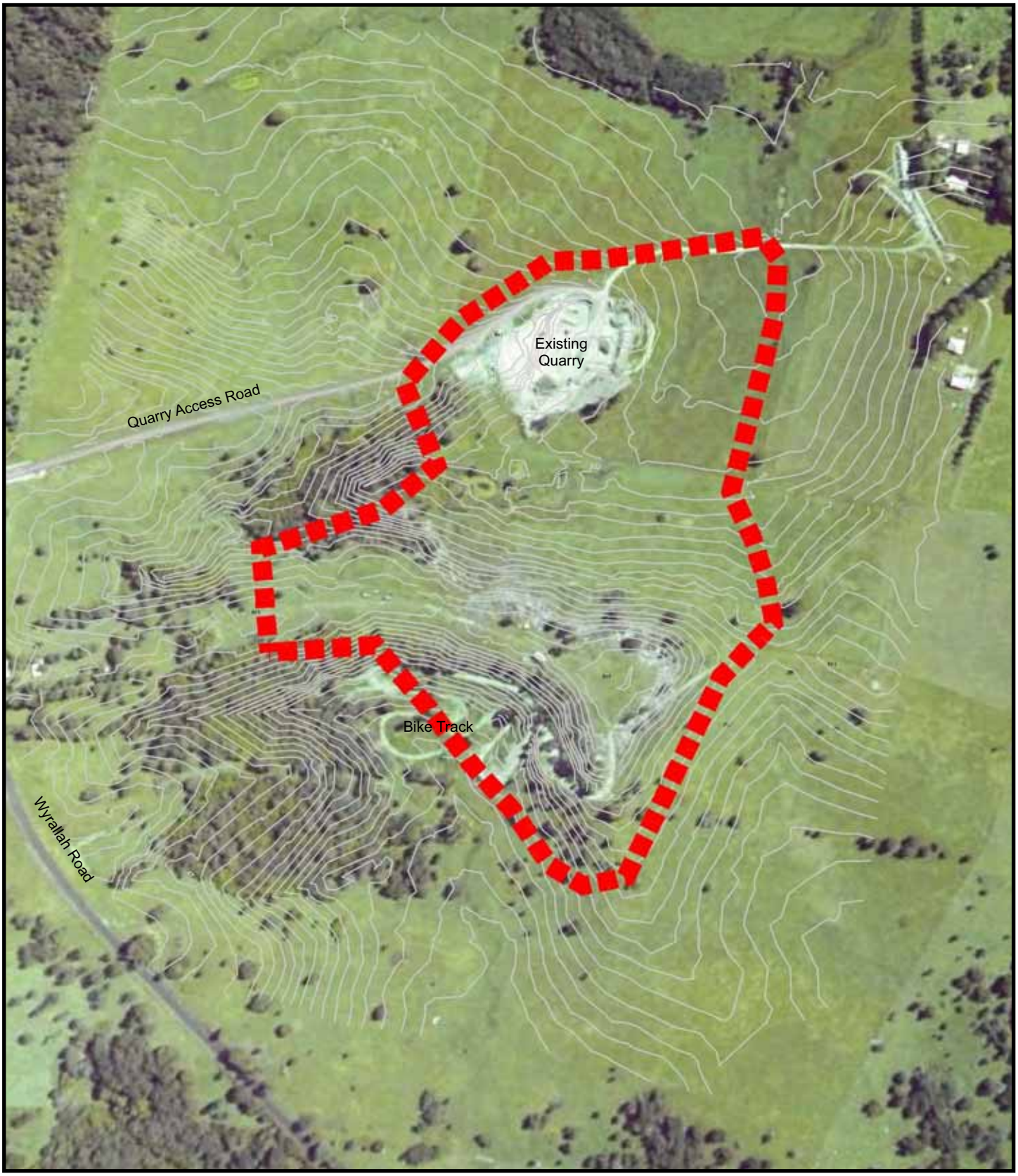
The highest point of the land, at approximately 50m AHD, occurs on the primary ridgeline, with the low point of 4m AHD adjoining an intermittent water course as it leaves the land at the north east portion of the site. The *Project Area* is located on the eastern slopes of this ridgeline. The land to the north east of the primary ridgeline generally drains north east and east for approximately 3km through the Proponents property to Tucki Tucki Creek via two small, unnamed water courses.

The *Project Site* is dominated by improved pasture species, with some areas of regrowth vegetation (Pink Bloodwood/Forest Oak Woodland), with some areas of moist sclerophyll forest found just outside the south western portions. Within the area of regrowth vegetation is an established motocross track. This can be clearly seen in the aerial photographs of the *Project Area and* wider surrounds as provided in *Figure 2.1* and *Figure 2.3*

The 1:250,000 geological map of Tweed Heads (SH56-2) shows that the site is underlain by the Jurassic age Kangaroo Creek Sandstone which is described as quartz sandstone and conglomerate. The higher elevations and western portions of the site are overlain by basaltic rocks of the Lismore Basalt, which is a tertiary age member of the Lamington Volcanics. Site observations of outcrop towards the southern extent of the site indicate that the basaltic rocks are limited to an area west of the *Project Area* and as a thin clay soil veneer above RL50m inside *Project Area*. The basal contact of the basalt appears to be sub horizontal, although regional experience indicates that lateral prediction of this contact for any great distance is unreliable (Coffey Geotechnics, 2008).

Geotechnical drilling undertaken by Coffey Geotechnics (refer *Appendix B of EA report*) has demonstrated that the geology of the Champions Quarry expansion area is underlain by Kangaroo Creek Sandstone which is the premier sandstone aggregate parent material in the Far North Coast of NSW. Typically this sandstone contains coarse quartz sandstone and conglomerate of varying characteristics.

Several thin coal seams and weathered siltstone interbeds were observed in the drill cores. Two thin bands of sulphide (pyrite) were encountered at one of the test drilling locations (BH5) undertaken by Coffey Geotechnics. These occurred at 12.15m depth below ground surface (50mm thick) and at 27.5m depth (20mm thick).



Legend

Extent of Quarry Extraction and Operations (Project Area)

Contours 2m

Figure 2.1

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		

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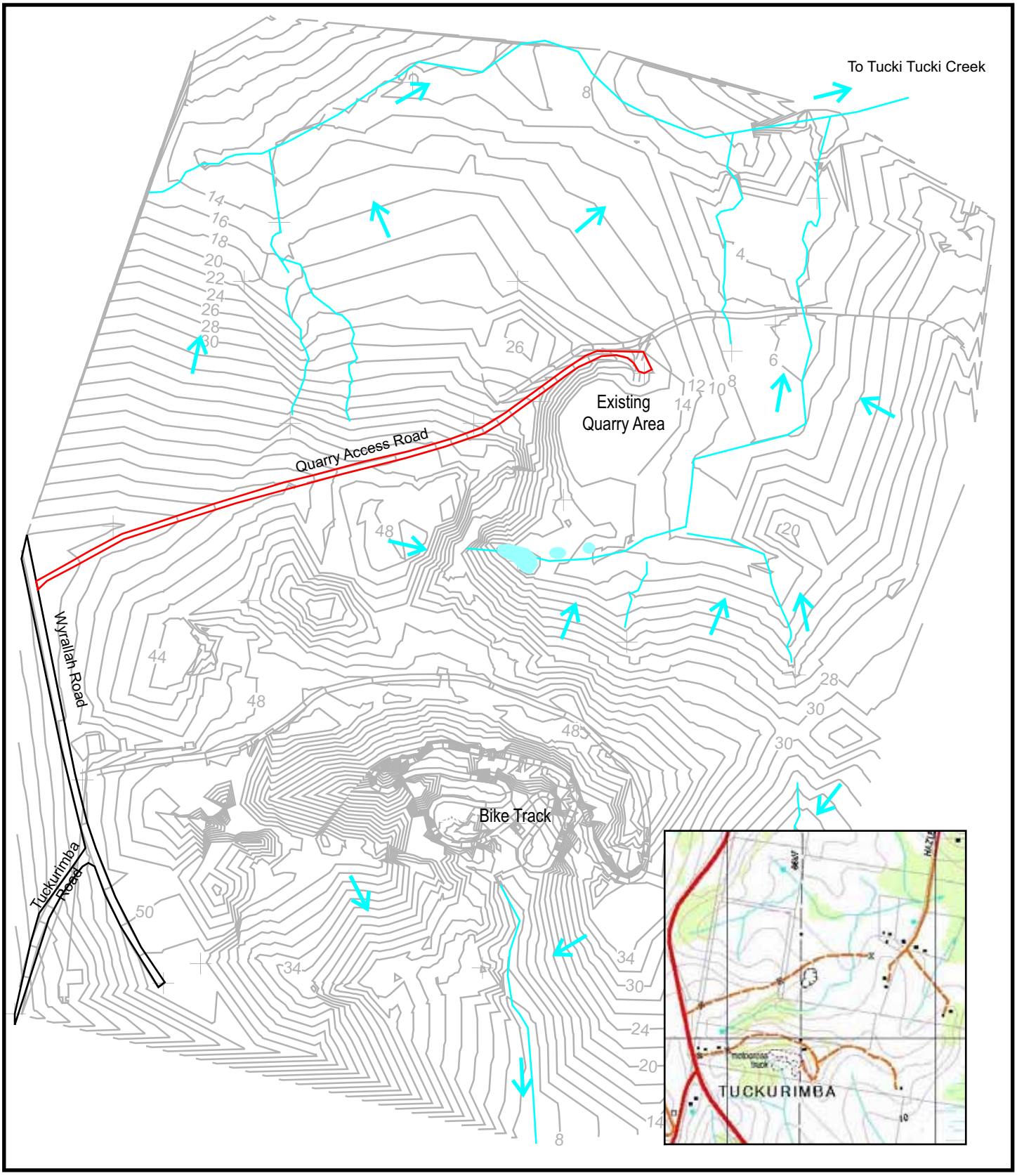

Legend

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

Figure 2.2

Existing Project Site Surface Water

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287pm_05		
Date:	20/08/08	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

Extent of Quarry Extraction and Operations (Project Area)

Figure 2.3

Aerial Photograph

Client:	Champions Quarry	
Project:	Champions Quarry Expansion	
Drawing No:	0098287pm_GIS_EA_F2.3	
Date:	26/08/2009	Drawing size: A4
Drawn by:	AM	Reviewed by: WW
Source:	Dept. of Lands	
Scale:	Refer to Scale Bar	

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2.2 LAND USE AND TENURE

2.2.1 Project Site and Land Tenure

The *Project Site* occupies an area of approximately 187.86ha, within a broader rural holding of 360ha owned by the proponent. Current Lot details of the *Project Site* are provided within *Table 2.1* below.

Table 2.1 Land Ownership Details

Property	Road Address	Landowner	Area
Lot 5 DP 57350	94 Hazlemount Land	Reavill Farm Pty Ltd	41.77ha
Lot 1 DP 729118	1586A Wyrallah Road	Reavill Farm Pty Ltd	1.75ha
Lot 4 DP 588125	1586 Wyrallah Road	Reavill Farm Pty Ltd	38.71ha
Lot 183 DP 1013042	1692 Wyrallah Road	Tucki Hills Pty Ltd	46.85ha
Lot 1 DP 127550	1694 Wyrallah Road	Tucki Hills Pty Ltd	34.30ha
Lot 101 DP 755746	1782F Wyrallah Road	Tucki Hills Pty Ltd	24.48ha
Total			187.86ha

2.2.2 Project Area

The area that will be disturbed to accommodate the expanded quarry is known as the *Project Area* and has been previously outlined within *Figure 1.2*. The *Project Area* presently contains the existing quarry, extensive areas of pasture, as well as a small area of vegetation and the motocross track on the south eastern corner. The *Project Area* has an area of approximately 16ha and forms the focus of this EA report.

2.2.3 Adjacent Lands

Adjacent to the *Project Site* are small to large rural properties, utilised for grazing or cropping. The vegetation on these surrounding properties is consistent with that on the *Project Site*.

2.3 RESOURCE DESCRIPTION

2.3.1 Materials and Products

The identified *Project Area* contains significant volumes of high quality sandstone material suitable for use within a wide range of construction materials and products. Geotechnical drilling undertaken by Coffey Geotechnics (*Appendix B*) has demonstrated that the geology of the Champions Quarry expansion area is underlain by Kangaroo Creek Sandstone which is the premier sandstone aggregate parent material in the Far North Coast of NSW. Typically this sandstone contains coarse quartz sandstone and conglomerate of varying characteristics. As a result, there are four principle rock qualities, with suitable uses identified as follows:

Topsoil and Overburden

These are found between 0m and 1.3m below the surface level. They range from medium grained sandy loam with traces of clay and organic materials to dark brown firm to stiff sandy clay with a medium plasticity. These will be utilised for construction of bunds and quarry rehabilitation, with excess material to be sold on.

Extremely To Moderately Weathered Sandstone

These were encountered between 0.5m and 14.8m below the surface within the *Project Area*. Broadly speaking, these are the weathered pale yellow and orange to red coloured inclusions of the upper portion of the deposit. These are suitable for the following uses:

- washed sand, both fine and coarse, for the concrete and asphalt market;
- certified engineered fill;
- general fill for subdivisions and roadway alignments;
- road base – on its own and/or blended to RTA specification DGS and DGB;
- brickies loam;
- filling sand, paving sand;
- specialty sands; and
- topsoil, landscaping rock and dimensioned stone.

Slightly Weathered To Fresh Sandstone

Typically encountered between 8m and 42.4m below surface level across the *Project Area*. This harder product occurs within the less weathered, deeper portion of the deposit and are often pale grey to grey. These are suitable for the following uses:

- washed sand, both fine and course, for the concrete and asphalt market;
- certified engineered fill;
- general fill for subdivisions and roadway alignments;
- higher strength zones may be used for armourments and rip rap;
- aggregate products for local roads under the Northern Rivers Local Government specifications; and
- crushed sandstone base and sub base for road construction.

Siltstone

This siltstone was encountered in seams between 11.5m and 31.05m below the surface level. It is fine grained, laminated grey to black, with some sandstone interbeds. These could only be utilised as general fill.

The Coffey Geotechnics report is provided as *Appendix B*.

2.3.2 Supply and Demand

Champions Quarry is considered to represent a significant resource of fine and coarse sand and sandstone products for the Lismore and Ballina region on the Far North Coast of NSW. Whilst it has not been officially recognised as a regionally significant resource within the Far North Coast Regional Strategy (DoP 2006), it is considered to be the largest resource of sand and sandstone products in the Lismore and Ballina region.

An economic demand assessment has been carried out by AVKO Mining and is provided within *Chapter 13*. This concluded that utilization of the resource that would be produced by the expanded Champions Quarry is a vital element of the sustainable development of the Far North Coast region. It presents an opportunity to contribute considerably to the identified resource deficiency within the region, providing a highly centralised source of quality sand products and a significant saving in green house gas emissions.

2.4 QUARRY OPERATIONS

2.4.1 Overview of Conceptual Quarry Plan

Quarrying currently occurs in a single pit (located in the proposed *Central Section*) that is proposed to be expanded laterally (toward the west) and vertically. No lateral expansion to the east is proposed beyond the existing quarry footprint. The expansion will allow for the extraction of approximately 315,000 tonnes of material from this *Central Section*. The expansion will result in a final pit floor level of 8m to 10m AHD. This final pit floor is designed to be suitable for the placement of sand washing and processing plant, product storage facilities, offices and other related facilities. A new pit (the *Southern Section* pit) is to be established to the south of the *Central Section* to extract a resource of high quality sandstone materials.

Quarrying would take place in active work cells of up to 3ha, with progressive rehabilitation taking place throughout the life of the quarry. It is envisaged that at any one time there would be up to three interconnected 3ha cells at various stages of development and/or rehabilitation. Depending on 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 (45^{o}) which can be worked by excavator or dozer from either the top or bottom of the excavation to allow for rehabilitation of the quarry back to its original agricultural land use; or

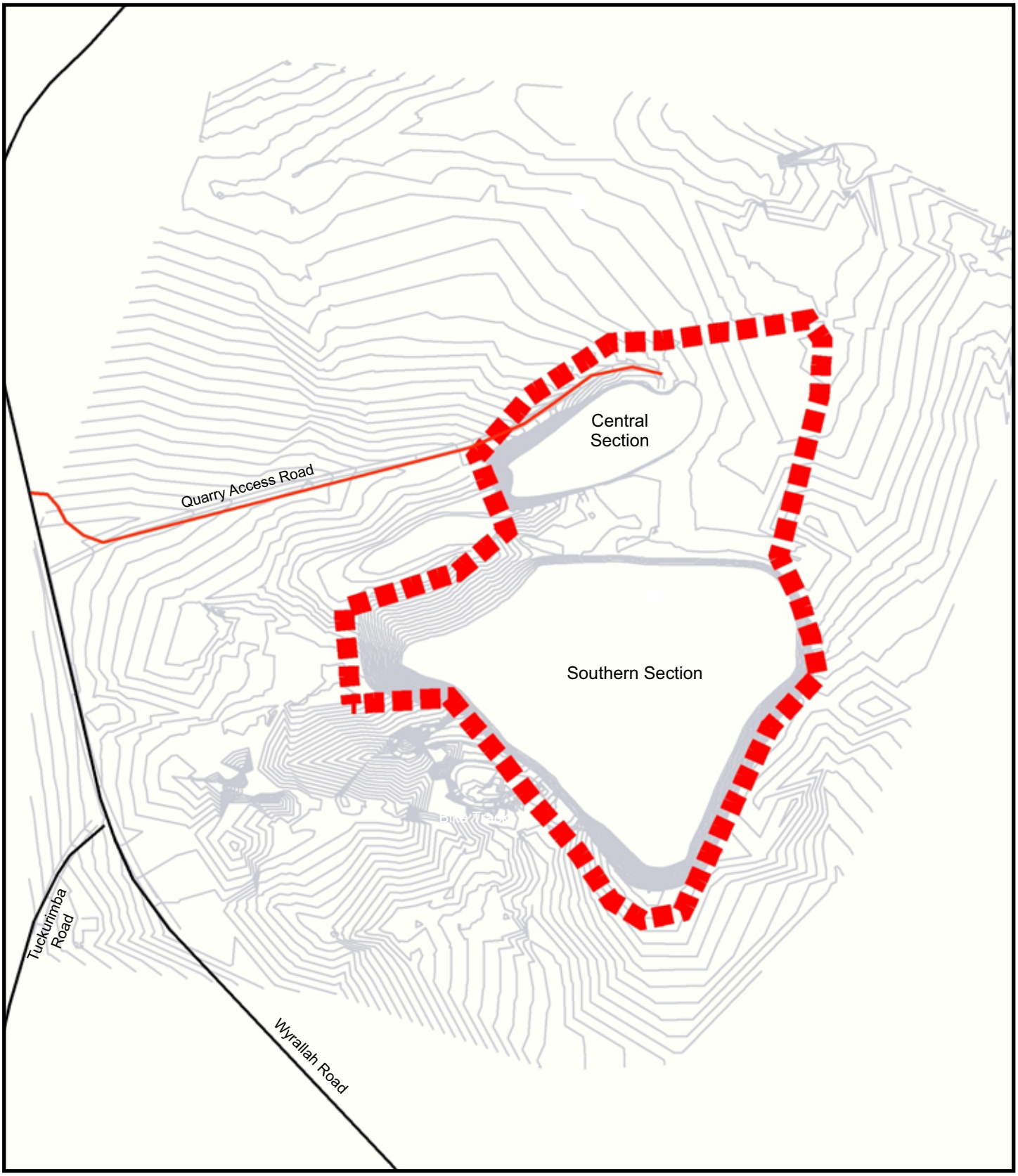
- final benching providing working faces with benches that are approximately 5m wide and 10m high where necessary.

The proposed final landform of the *Central* and *Southern Section* pits is shown in *Figure 2.4* and an indicative 3D model of the final quarry landform is provided as *Figure 2.5.* A quarry cross-section is shown in *Figure 2.6.*

Quarrying will initially occur laterally to the south and west within the *Central Section* , before moving to establish the *Southern Section* pit. Production rates are to increase to 250,000 tonnes per annum depending on demand for sand and sandstone products. *Table 2.2* provides a summary of production based on pit location and depth of extractions.

Table 2.2 Extraction Rates and Amounts - Summary

Quarry Section	Area (hectares)	Volume (m^3)	Tonnes
Central Section	2.5	143,000	314,600
Southern Section	12	2,682,250	5,900,950
Total	**14.5**	**2,825,250**	**6,215,550**



Legend

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

Figure 2.4

Quarry Plan - Final Landform

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287pm_QMP_F4.2		
Date:	25/08/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	VGT		
Scale:	Refer to Scale Bar		

N 0 40 80 120 160 200m

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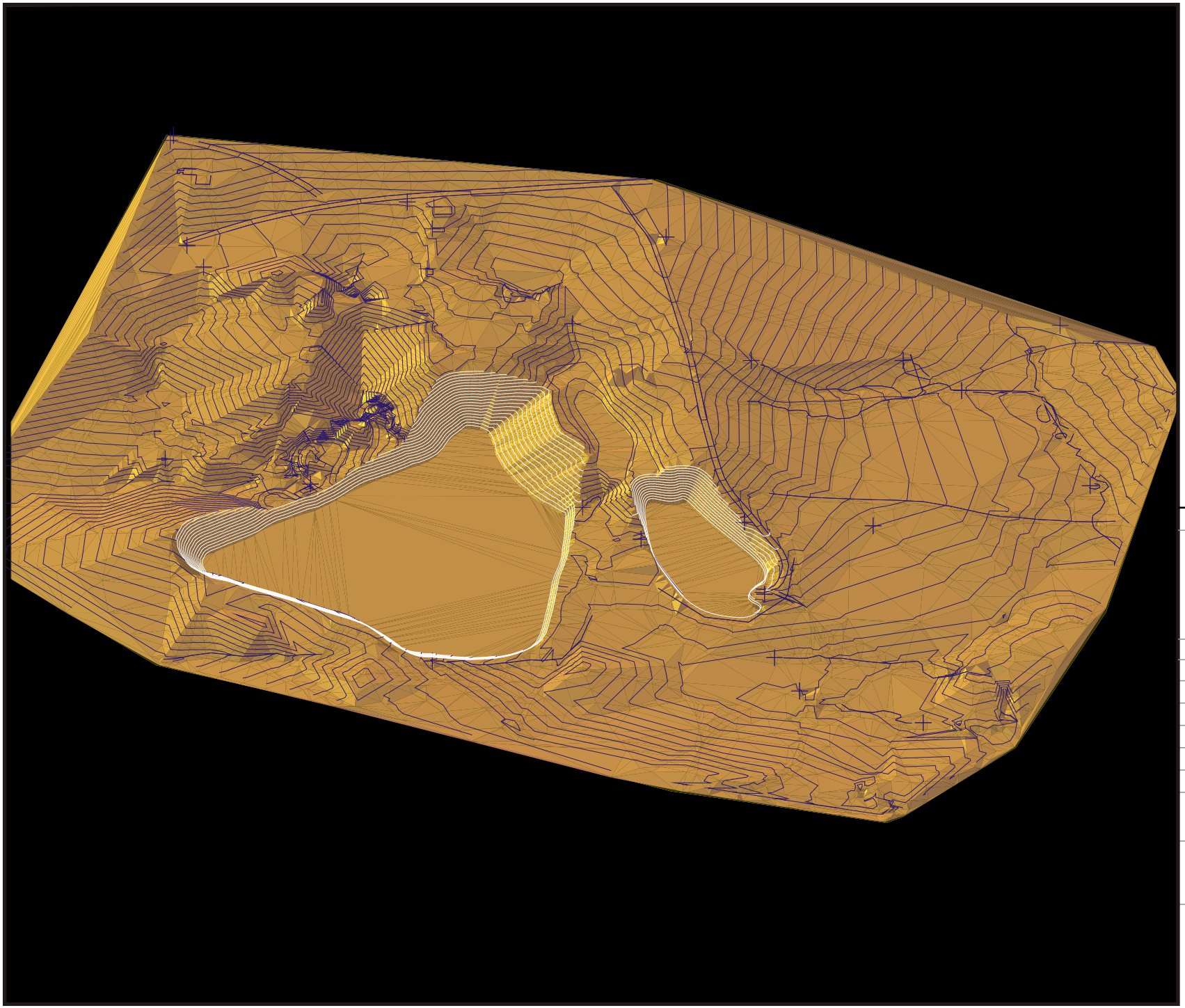

Figure 2.5

Three Dimensional - Final Landform

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287_EA_F2.5		
Date:	20/08/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	VGT		
Scale:	-		

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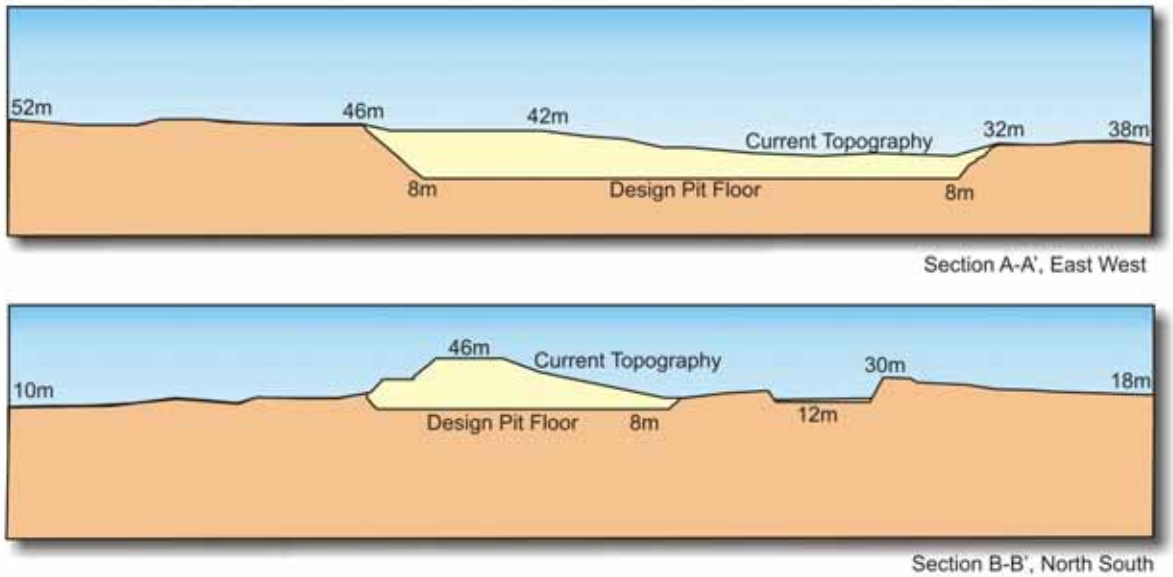
Quarry Cross-Sections



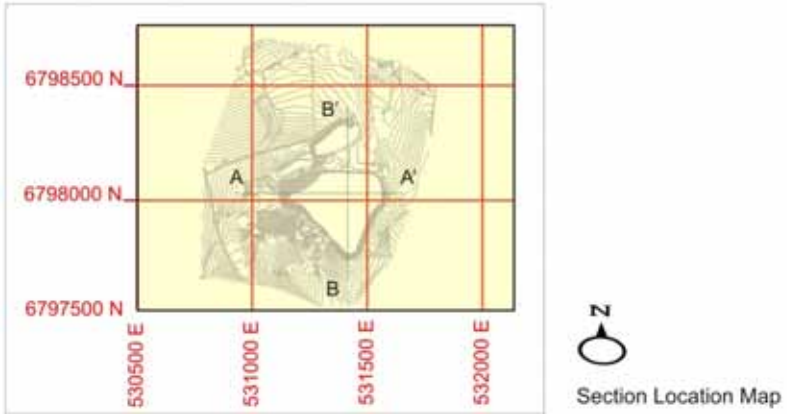


Figure 2.6

Quarry Cross-Sections

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287_EA_F2.6		
Date:	20/08/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	VGT		
Scale:	-		

2.4.2 Extraction

Topsoil and Overburden

The lateral expansion of the *Central Section* and the establishment of the *Southern Section* pit in 3ha work cells will require the removal of topsoil and overburden as required. Some topsoil and overburden material will be used on-site for the construction of bunds and for rehabilitation, with the excess material to be sold on. At least 20% will be stockpiled and managed (through seeding to prevent surface erosion) for on–site use in rehabilitation activities at the end of the active life of each quarry cell.

Overburden removal will generally be by excavators, bulldozers and site trucks, with other plant utilised as required for compaction, shaping and rehabilitation.

Given the limited amount of native vegetation to be removed, there will only be small amounts of vegetative debris produced during overburden removal.

Quarry Products

The primary target resources at Champions Quarry are fine and coarse sand and sandstone products. The identified resource is generally soft and does not require drilling and blasting. The majority of extraction is able to take place using either bulldozers or excavators directly at the active quarry face. In areas where the strength of the rock mitigates against the use of bulldozers and excavators, either a rock saw or nitrogen fed jackhammer will be used to assist in the extraction of dimensioned sandstone. This extracted quarry material will be transported to the processing area using on-site dump trucks loaded with 3 – 5m^3 rubber tyred front end loaders. Overall, the following items of plant are proposed to be used in the extraction of the resource and transportation on-site:

- D8/D9 dozer or equivalent;
- 20 – 40 tonne tracked excavators;
- nitrogen fed jack hammer (as required);
- rock saw (as required);
- grader;
- bob cat;
- water cart;
- 3 – 5m^3 rubber tyred front end loader; and

- site dump trucks.

Due to the nature of the materials, no blasting will be undertaken.

Stockpile Management

It is estimated that a maximum of 35,000 tonnes of raw resource materials will be stored at any one time. These unprocessed materials will be stored in the quarry floor of the active cell to enable large scale, order specific, processing to occur as required.

All product stockpiles will be located on the quarry pit floor with water sprinklers to be employed to suppress the dispersion of dust.

As previously outlined, overburden and topsoil stored for later use (20% of total overburden amount) in rehabilitation activities will not be placed on the quarry floor, they will be strategically placed as vegetated bunds such that they do no adversely impact on the visual amenity of the area. Seeding will be incorporated into the management of the topsoil and overburden stockpiles where required to minimize the potential for erosion and fugitive dust. During establishment of vegetation on the stockpiles, water will also be utilised. An example of existing on-site bund construction and vegetation works is provided as *Plate 2* below.

Plate 2 – Newly placed on-site screening bund with native revegetation

2.4.3 *Water Management*

The water supply system has been specifically designed to be self sufficient and not place additional demand on existing water supplies to the locality. In this regard, a detailed soil and water management plan has been developed (see *Appendix I*) which includes a detailed hydrological balance model for both the operational and post operational phases of the quarry.

Sedimentation ponds are proposed to be constructed at the toe of each of the 3ha operation cells to collect quarry run-off and any groundwater seepage inflow that may occur. The water will then be diverted to the *Water Reuse Dam* and be reused for processing of quarry products, dust suppression (at processing plant, active quarry areas, stockpiles etc.) and vehicle washing. Diversions are proposed to be established around the top of the operational cells such that clean water runoff is diverted away from the pits.

Water will not be directly discharged from the active *Project Area* to the surrounding environment as part of the proposed quarrying operations without appropriate capture and treatment prior to reuse, land application or discharge when required. Water will be captured from the roofs of all on-site sheds proposed for construction and will be utilised for domestic purposes. An on-site domestic waste water treatment system will be installed.

2.4.4 *Processing*

Materials Processing

Following excavation of the raw sandstone materials, some of the material will be crushed and screened in the *Southern Section* pit, while all sand washing and processing will be undertaken in the *Central Section*. *Figure 2.7* 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. The resource is to be processed to make suitable for marketing for the following products:

- washed sand for concrete and bitumen markets;
- select and engineered fill;
- road base;
- blended road base;
- aggregates;
- bricklayers sand;
- topsoil;
- dimensioned stone and rock; and
- specialty sands.

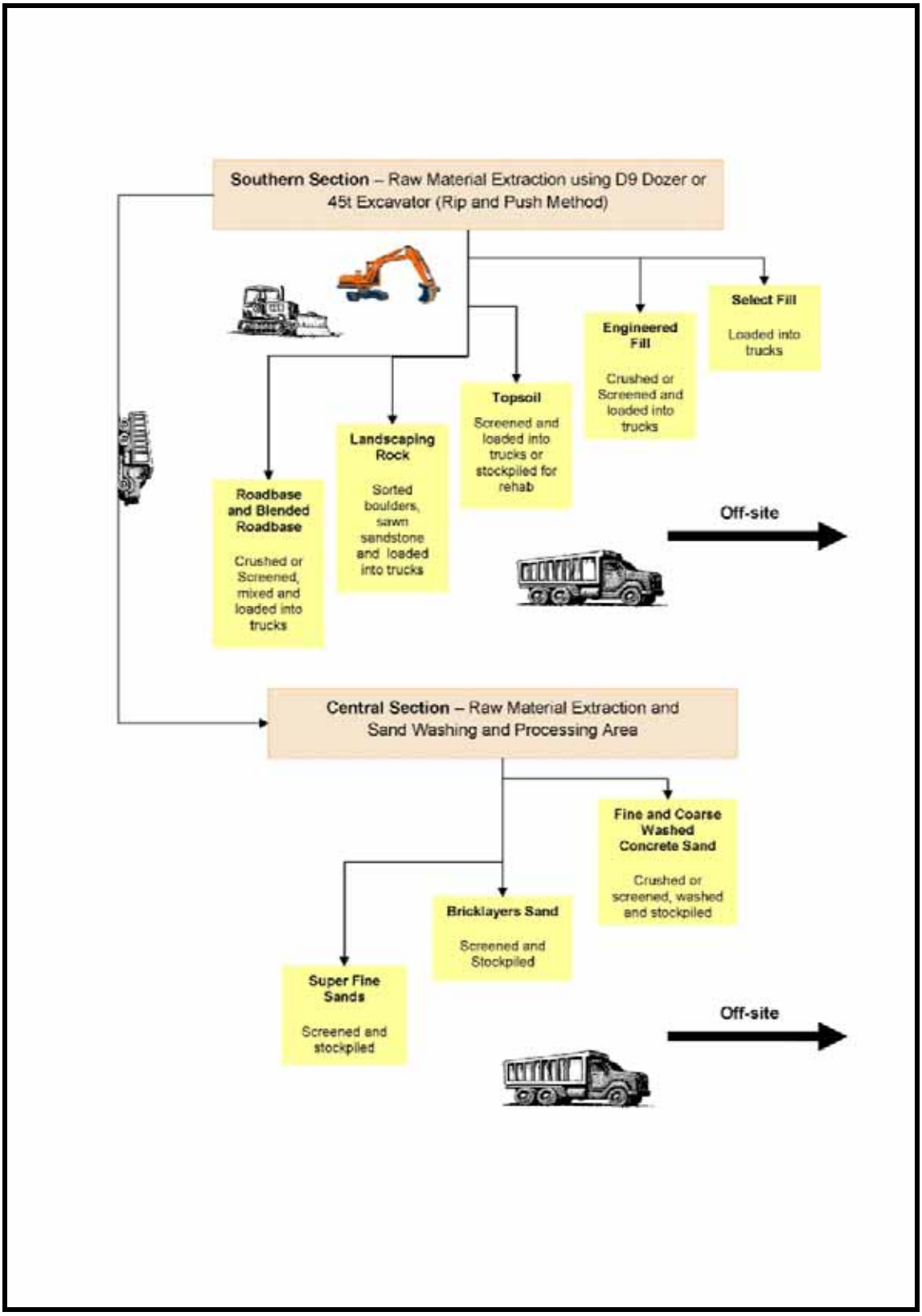


Figure 2.7 Champions Quarry Process Flow Diagram

Processing will take place utilising the plant situated within the floor of the *Central Section* pit. Plant to be located in this area comprises of a sand screening and washing plant and material stackers. A mobile crushing and screening plant is proposed to be used within the active quarry cells on an as required campaign basis only.

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 equivalent). Proprietary information for the mobile crushing and screening plant is provided within *Appendix J*.

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 a Water Reuse Dam (see *Chapter 8* and *Annex I*) for settlement and 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 of acidity are not expected for the waste water, the Water Reuse Dam is proposed to be monitored and pH adjustments (e.g. Aglime) made if deemed necessary.

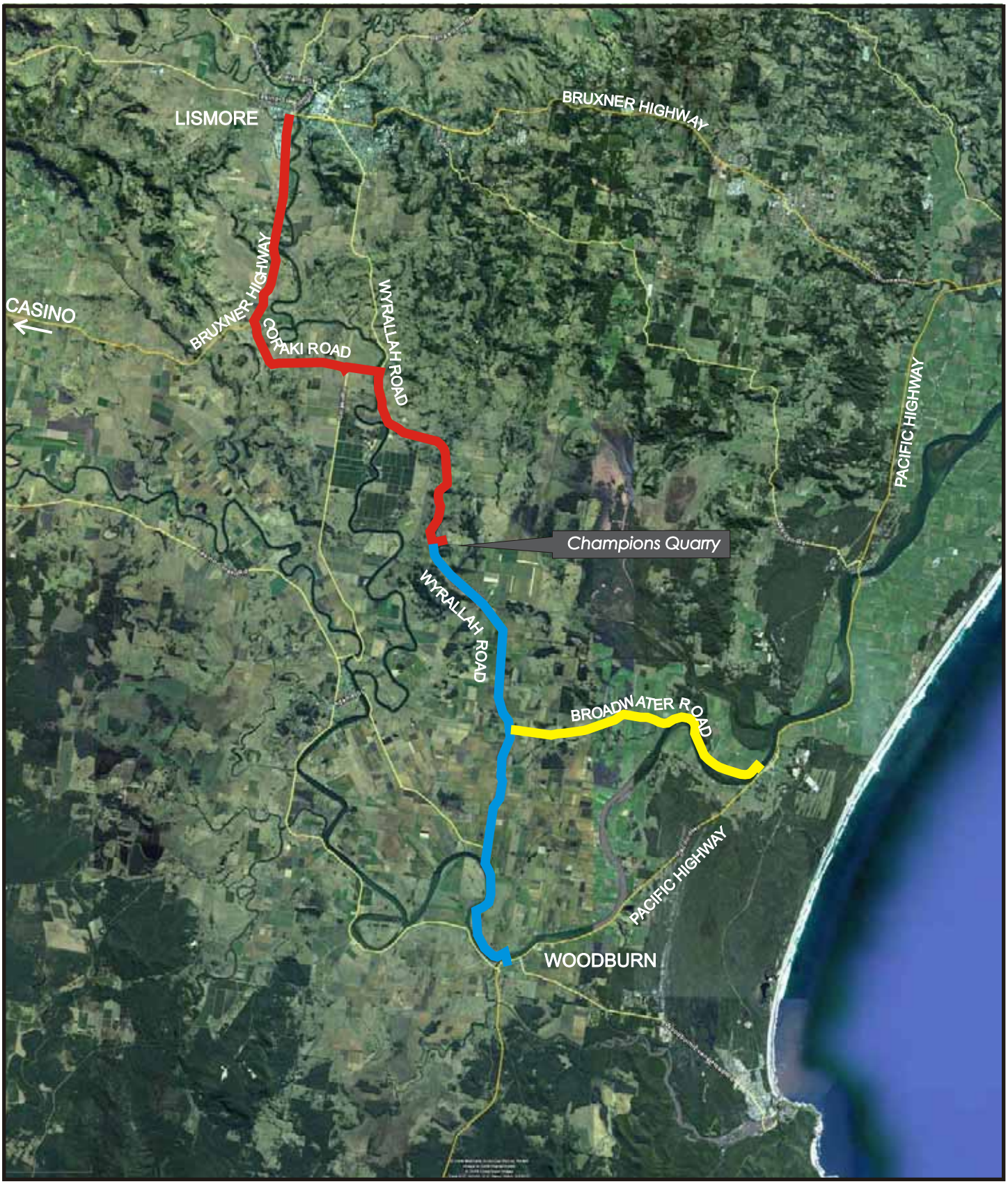
End Product Stockpiling

Stockpiling of processed material will not exceed 35,000 tonnes at any one time. This will be stored in the *Central Section* and *Southern Section* pits. Water will be employed to suppress dust dispersion where required.

2.4.5 *Road Haulage*

A front end loader (FEL) will be used to load processed material into haul trucks that will transport material directly off-site. The access from the quarry to the primary haulage road (Wyrallah Road) will be via the existing constructed gravel internal road which will be upgraded to a bitumen standard. The proponent has recently upgraded the main intersection at Wyrallah Road to an appropriate standard for the current and proposed quarry traffic (refer *Plate 3* below). A vehicle passing bay will be constructed along the internal road. The proposed off-site haulage routes are shown on *Figure 2.8*

Plate 3 – Newly constructed site access intersection with Wyrallah Road



Legend

- Route 1
- Route 2
- Route 3

Figure 2.8

Proposed Haulage Routes

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0008287pm_EA_F2.8		
Date:	26/08/09	Drawing size:	A4
Drawn by:	AM	Reviewed by:	WW
Source:	Google Earth Pro		
Scale:	Refer to Scale Bar - Approximate		

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0 1 2 3 4km

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Given the variety of materials proposed to be produced by the quarry, there will be multiple destinations for the materials. The most likely destinations include:

- south via Wyrallah Road and Dungarubba Road to the Pacific Highway upgrade projects (as well as other large scale infrastructure and construction projects) in the localities of Broadwater, Woodburn and Ballina (refer *Figure 2.8*); and
- north via Wyrallah Road, Wyrallah Ferry Road, Coraki Road and the Bruxner Highway to Lismore, Alstonville, Casino and surrounds to be used in construction and infrastructure projects (refer *Figure E1.1*).

2.4.6 Facilities and Services

The expanded quarry will require a number of new facilities and services to be installed on-site. These are required to accommodate needs of workers, as well as to provide ancillary storage for materials extraction and processing plant. These structures will be mostly located at the *Central Section* pit and include:

- partially covered stockpile holding and service area comprising of a 100m x 40m concrete slab with product/aggregate bays;
- building containing an office and staff amenities;
- roof water collection tanks;
- vehicle storage sheds with servicing bay and bunded fuel tank;
- vehicle wash down area;
- weigh bridge; and
- up to four shipping containers for small volume general and hydrocarbon storage purposes.

2.4.7 Operating Hours and Workforce

The proposed operating hours for the quarry are from 7.00am to 5.30pm during the weekdays and from 7.30am to 3.00pm on Saturdays for general quarrying. Non-operational maintenance and environmental management works non audible at nearby residences will be undertaken outside of these operational hours.

It is envisaged that at times of peak production, the quarry will employ up to 10 employees and subcontractors used for product extraction, stockpiling, processing and transportation.

2.5 *PROJECT TIMING*

The expansion will commence immediately in the *Central Section* to allow for the continual demand for sandstone materials to be met, as well as providing for a final landform which will allow for the establishment of all stationary plant and facilities on the pit floor.

Given that approximately 315,000 tonnes of material need to be extracted from this area, it is envisaged that the final landform of the *Central Section* pit will be attained within 18 months. Once this has been established, extraction will commence within the *Southern Section* pit, based on the three by 3ha active quarry cell plan.

2.6 *ENVIRONMENTAL MANAGEMENT*

An environmental management strategy will be put in place to mitigate the potential social and environmental impacts addressed throughout this EA. The strategy will detail the following:

- environmental issues;
- management issues;
- performance indicators;
- mitigation measures;
- monitoring requirements;
- responsibilities and timing;
- incident management; and
- reviewing and reporting.

2.7 *REHABILITATION AND FINAL LAND USE*

A rehabilitation plan has been developed which will ensure that works are implemented progressively to enhance the scenic and environmental quality of the site, increase habitat for wildlife and utilise suitable areas for agricultural pursuits. With regards to the progressive rehabilitation of the 3ha work cells, the following procedures will take place with a view to returning the site to its current grazing use:

- remove any felled trees and logs from work cells and stockpile;
- long term stockpiles of overburden and topsoil to be revegetated with non – invasive grasses;

- remove problem weeds or prevent from spreading;
- doze the face of the completed quarry areas to a slope of between 1:1 to 2:1;
- use overburden, loose quarry material and topsoil to cover the completed quarry area;
- rip the material on the contour to prevent erosion in the event of heavy rain;
- chisel plough and harrow the site on the contour to prepare a seedbed;
- apply organic fertilizers;
- sow site with a mixture of native grasses and legumes; and
- keep cattle off the area for approximately 12 months.

This method was used on an adjoining property owned by the Proponent to successfully rehabilitate a former quarry. This method aims to ensure that the site can withstand significant rainfall occurrences without erosion. This methodology has been expanded upon within the Preliminary Quarry Management Plan that has been developed and is included within *Appendix J*.

In addition to rehabilitation of the quarry cells, it is also proposed to provide native vegetation plantings at strategic locations across the site to provide for:

- a 20m wide corridor of Koala habitat tree planting;
- 10m wide corridor of native vegetation of non-Koala tree planting; and
- Tree planting on earthen bunds

The location of these plantings has been designed to enhance the Koala habitat value of the site, as well as providing for visual relief when viewing the quarry site from key visual locations. This is discussed further within *Chapter 7* and *Chapter 14*

Additionally, a comprehensive biodiversity offset strategy is outlined within *Chapter 7.* This is aimed at offsetting the minimal amounts of clearing proposed to be undertaken and to improve the overall ecological values of the *Project Site* and Tuckurimba area. This is to be implemented and managed through a Vegetation Management Plan developed in consultation with DECCW and the DoP.

2.8 *RE-SUBDIVISION OF LOTS*

It is proposed to undertake a re-subdivision of six lots associated with the proposal. The objective of this is to allow proposed quarry footprint to be situated entirely within one allotment.

Figure 2.9

Indicative Location of Screening Tree Planting Areas

Client:	Champions Quarry		
Project:	Champions Quarry Expansion		
Drawing No:	0098287pm_EA_F2.9		
Date:	08/09/09	Drawing size:	A4
Drawn by:	TH	Reviewed by:	MC
Source:	-		
Scale:	Not to Scale		

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