APPENDIX 3:

“Albion Park Quarry – Quarry Environmental Management Plan (Perram and Partners - July 2008)”

Albion Park Quarry

Quarry Environmental Management Plan

For: Cleary Bros (Bombo) Pty Ltd

Report 112R1
July, 2008

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INTRODUCTION

1.1 BACKGROUND

Cleary Bros (Bombo) Pty Ltd has extracted and processed hard rock from quarries in the Albion Park area since the middle of last century. In May 2005 the Minister for Infrastructure and Planning granted development consent for the company to extend quarrying into a new area, about 400 metres south east from its then operating quarry. The Minister also granted consent for a haul road linking the quarry extension with the existing quarry. The Minister was the consent authority because at the time the proposal was considered State significant development under provisions (since repealed) of the Environmental Planning and Assessment Act 1979.

The haul road consent was not challenged and became operative after 28 days. The quarry consent however, was put aside to allow an appeal to be heard in the Land and Environment Court. In February 2006 the Court granted development consent for the quarry extension, issuing a revised set of conditions.

The haul road consent issued by the Minister traversed land owned by Readymix Holdings (now Rinker Australia Pty Ltd). During the period of the court appeal, Rinker revised its quarrying plan and subsequently indicated to Cleary Bros that the approved haul road route would not be available. Cleary Bros then developed a new route for an access road to the quarry and with Rinker's concurrence submitted a development application to Shellharbour City Council. On 10 May 2007 Council granted development consent for the new access road linking the quarry extension with the existing haul road to Cleary Bros crushing plant. A subsequent development application was submitted to Council at the request of Rinker for approval to construct a short road across the approved quarry access road to maintain access to Rinker property from Dunsters Lane.

The Minister's quarry consent and Council's access road consents are included as *Appendix A* and *Appendix B* to this document.

The location of the approved quarry and access road is shown on *Figure 1.1*. Details of the site and affected properties are presented in section 2.

Base Aerial and Cadastral - LPI and Shellharbour City Council 2003. Aerial Photo date 24/6/2002.

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FIGURE 1.1 Location of Works

1.2 PURPOSE OF THE QEMP

This quarry environmental management plan (QEMP) describes construction and operational activities associated with the extension of Cleary Bros' Albion Park quarry that have the potential to impact on the environment. Its purpose is to be a reference document for use by:

- Cleary Bros staff with responsibility for managing the operation and its environmental performance;
- environmental auditors;
- regulatory bodies;
- the community monitoring committee established in accordance with the quarry development consent; and
- interested members of the public who may access the QEMP via the internet or in person.

For the QEMP to fulfil its purpose it needs to contain all of the information relevant to environmental management of the quarry. Consequently the QEMP incorporates a number of the sub-plans and other documents specified in the development consents. In cases where these other documents have been separately produced and approved in stand-alone format, only the essential content of the sub-plans has been included, to avoid the QEMP becoming unwieldy.

Table 1.1 lists the conditions of consent requiring documentation to be prepared and indicates the manner in which the requirements of those conditions have been incorporated in the QEMP.

Table 1.1 CONSENT CONDITIONS REQUIRING APPROVED DOCUMENTATION

Condition No		**Documentation Specified**	**Manner of Inclusion**
Quarry (court consent)	**Access Rd** (council consent)		
Schedule 4, Condition 1	Cond. 15	Survey Plan	Separately approved document. A smaller scale copy is incorporated in the QEMP.
Schedule 4, Condition 7		Noise Monitoring Program	Separately approved document. Noise monitoring requirements are listed in the QEMP.

Schedule 4, Conditions 14 and 15		Blast Management Plan and Blast Monitoring Program	Combined into a separately approved document. Blast management and monitoring requirements are listed in the QEMP.
Schedule 4, Cond. 20		Dust Management Plan	Separately approved document. Dust monitoring requirements are listed in the QEMP.
Schedule 4, Conditions 27 to32	Cond. 23 (erosion & sediment plan)	Water Management Plan	Separately approved documents for erosion and sediment control, surface water and groundwater monitoring. Requirements of approved plans are listed in the QEMP. Water balance included.
Schedule 4, Cond. 34	Cond. 25	Vegetation Clearing Protocol	Separately approved documents. Clearing protocols are listed in the QEMP.
Schedule 4, Cond. 37		Vegetation Management Plan	The Vegetation Management Plan is included as an appendix to the QEMP.
Schedule 4, Cond. 40	Cond. 34	Rehabilitation Management Plan	The rehabilitation management plans for the quarry and haul road are addressed in the QEMP.
Schedule 4, Cond. 51	Cond. 40	Heritage Management Plan	Separately approved document. Heritage management requirements are listed in the QEMP.
Schedule 4, Cond. 55	Cond. 43	Landscape Plan for quarry works and road	Separately approved documents. Smaller scale copies of the plans are incorporated in the QEMP.
Schedule 4, Cond. 63		Emergency Management Plan	The emergency management plan is addressed in the QEMP.
Schedule 4, Cond. 65		Bushfire Management Plan	The bushfire management plan is addressed in the QEMP.
Schedule 6, Condition 1		Environmental Management Strategy	The environmental management strategy is presented in the QEMP.
Schedule 6, Condition 3		Environmental Monitoring Program	The environmental monitoring program is presented in the QEMP.

1.3 DOCUMENT CONTROL

1.3.1 Approval

The QEMP is to be submitted to the Director-General of Planning for approval. The date of approval will be noted at the front of the document prior to distribution. The QEMP will also be submitted to Shellharbour City Council for approval of documentation pertaining to the access road.

1.3.2 Distribution

Following receipt of approval the QEMP is to be made available as follows:

- within 14 days send copies to Department of Environment and Climate Change, Shellharbour City Council, Department of Primary Industries;
- within 14 days make the document publicly available;
- within one month provide a copy to the community consultative committee;
- within one month place a copy on Cleary Bros web site

1.3.3 Amendment

The QEMP is a perpetual document, capable of being amended and updated as needed to take account of changes occurring from time to time. Such updates will enable the operator to keep the document relevant to changing circumstances including:

- the outcome of environmental monitoring and audits;
- any future development consents issued;
- periodic review and re-issue of the environment protection licence;
- modified practices based on market requirements or improved technology;

The QEMP may be amended at any time at the discretion of Cleary Bros or as requested by the Director-General. Any amendment must be approved by the Director-General of Planning before it has effect. An amendment to the QEMP is to be consistent with the development consents currently in force for the quarry and access road.

Following approval, any amendment to the QEMP is to be made publicly available in the manner described in section 1.3.2 above.

1.4 OBJECTIVES

The objectives of the QEMP area are as follows:

- present the environmental management strategy for the hard rock quarry extension;
- detail practices, procedures, work methods and other requirements necessary for the operation to achieve environmental goals specified by the development consent and environment protection licence;
- include within a single document, all of the regulatory environmental requirements for operating the site.

Requirements for the environmental management strategy are included in Condition 1 of Schedule 6 of the quarry consent, as follows:

> *(a) provide the strategic context for environmental management of the development;*
> *(b) identify the statutory requirements that apply to the development;*
> *(c) describe in general how the environmental performance of the development would be monitored and managed during the development;*
> *(d) describe the procedures that would be implemented to:*
> - *keep the local community and relevant agencies informed about the operation and environmental performance of the development;*
> - *receive, handle, respond to, and record complaints;*
> - *resolve any disputes that may arise during the course of the development;*
> - *respond to any non-compliance;*
> - *manage cumulative impacts; and*
> - *respond to emergencies; and*
>
> *(e) describe the role, responsibility, authority, and accountability of all the key personnel involved in environmental management of the development.*

The QEMP forms part of Cleary Bros' Environmental Management System, compliant with ISO/AS 14001.

1.5 CONSTRUCTION AND OPERATION

Development consents for the quarry and access road require site development work to be undertaken prior to commencement of hard rock extraction in the extension area. Section 4 of the QEMP describes environmental controls to be implemented during the development phase. This section will become redundant when construction work is complete.

At the time of preparing the QEMP, Cleary Bros is extracting and processing hard rock at its Albion Park operations in accordance with previous development consents issued by Shellharbour City Council. The development consents for the extension area and access road will operate from the date that work, other than investigatory or monitoring activities, commences respectively in the extension area, Lot 1 DP 858245 and on the route of the access road, Lot 2 DP 858245 and Lot 23 DP 1039967.

1.6 SPECIALIST INVESTIGATIONS

Prior to the 2006 quarry development consent being granted, a number of investigations were undertaken by specialists to determine characteristics of the quarry extension site and make predictions relevant to the hard rock extraction operation. These investigations provided information for the development application and rezoning process. All of the specialist reports listed below dated prior to October 2003 are included in *Proposed Quarry Extension, Albion Park, Environmental Impact Statement* (Perram & Partners, October 2003). Any findings or recommendations relevant to environmental management of the site have been incorporated into the management procedures referenced in Section 5 of this QEMP.

- *Report on the Dry Stone Walls on the Cody's and Lindsay Lane Properties, Albion Park* – Geoff Duggan, August 1997;
- *A Brief Report on the Geology of the Cody Property* – R.W. Corkery &Co Pty Ltd, September 1997;
- *Preliminary Hydrogeological Study, Proposed Rezoning Area, Cleary Bros Albion Park Quarry* – Golder Associates, March 1998;
- *An Archaeological Assessment of a proposed Hard Rock Quarry Extension Near Albion Park, New South Wales* – Robert Paton Archaeological Studies Pty Ltd, May 1998;
- *A Report on the Effect of an Extension to Cleary Bros Quarry at Albion Park on the Continued Operation of the Dairy Farm "The Hill" at Dunsters Lane* – Cowman Stoddart Pty Ltd, June 2001;
- *Albion Park Quarry Extension, Air Quality Impact Assessment* – Richard Heggie Associates, October 2002;
- *Noise and Blasting Impact Assessment, Cleary Bros Albion Park Quarry* – Richard Heggie Associates, December 2002;
- *Transport Study, Albion Park Quarry, Extension to Quarry Area* – Masson Wilson Twiney, April 2003;
- *Non - Indigenous Heritage Assessment of the Impact of the Proposed Quarry (Lot 1 DP 858245) Near Signal Hill, Croom* – HLA–Envirosciences Pty Limited, April 2003;
- *Flora and Fauna Assessment, Proposed Extension to Cleary Bros (Bombo) Albion Park Quarry, City of Shellharbour* – Kevin Mills & Associates, May 2003;

- *Results of the Water Sampling and Analysis at Albion Park Quarry* – Golder Associates, 4 June 2003 (letter report).

Other reports of site investigations undertaken by or on behalf of Connell Wagner are included in the Local Environmental Study prepared for Shellharbour City Council (Connell Wagner, October 2003). These reports are generally consistent with the assessments contained in the EIS, with the exception of the indigenous heritage study, which is considered to supersede that of Robert Paton, referred to above. The LES indigenous heritage study is referenced below:

- *Aboriginal Archaeological Survey & Assessment Report, Albion Park Quarry Proposed Extension* – Mary Dallas, February 2001;

Following receipt of the initial development consent from the Minister for Infrastructure and Planning in May 2005, a number of separate management plans were prepared consistent with that development consent. The plans were progressively submitted to the Director General for approval and where necessary modified for consistency with the subsequent court approval. Approved plans are listed below:

- *Soil and Water Management Plan, Proposed Quarry Extension, Stage 1* – K. F. Williams & Associates, April 2005 (drawings only);
- *Vegetation Clearing Protocol, Albion Park Hard Rock Quarry and Associated Haul Road* – Kevin Mills & Associates, July 2005;
- *Surface Water and Groundwater Management Plan, Cleary Bros Quarry, Albion Park* - Golder Associates, October 2005;
- *Dust Management Plan, Albion Park Quarry Extension* - Richard Heggie Associates, November 2005;
- *Landscape Plan, Albion Park Quarry* – Taylor Brammer Landscape Architects, revision C, January 2006 (drawing only)
- *Noise Monitoring Program/Blast Management Plan, Albion Park Quarry Extension* - Richard Heggie Associates, February 2006;
- *Heritage Management Plan, Cleary Bros Albion Park Quarry* – Navin Officer Heritage Consultants, March 2006.

Two additional studies were undertaken to accompany the development application for the access road submitted to Shellharbour Council. Those studies are referenced as follows:

- *Flora and Fauna Assessment, Access Road to Lot 1 DP 858245* – Kevin Mills & Associates, August 2006;
- *Aboriginal Archaeological Assessment, Albion Park Quarry Extension Haul Road* – Mary Dallas, March 2007 (letter report being an adjunct to the 2001 report by the same author, see above).

Following receipt of development consent for the access road from Shellharbour Council the following reports/plans were completed:

- *Vegetation Clearing Protocol and Vegetation Management Plan, Access Road for Albion Park Hard Rock Quarry* – Kevin Mills & Associates, September 2007;
- *Landscape Plan and Details, Proposed Access Road, Lots 1, 2 and 3 DP 858245* - Taylor Brammer Landscape Architects, revision B, September 2007 (drawing only)
- *Vegetation Management Plan for Albion Park Hard Rock Quarry*– Kevin Mills & Associates, October 2007

In addition, the previously approved soil and water management plan and the landscape plan for the quarry were amended to reflect the redesign required for the new access road.

1.7 PERFORMANCE REQUIREMENTS

Condition 2 of Schedule 3 of the development consent for the quarry requires that the development be conducted in accordance with:

- the conditions of the consent;
- the development applications submitted in October 2003; and
- the environmental impact statement (Perram & Partners 2003).

Should there be any inconsistency, the development consent prevails. Cleary Bros is also required to comply with any reasonable requirements of the Director-General arising from the Department of Planning's assessment of any documentation submitted in accordance with the consent or the implementation of any actions or measures contained in the documentation.

In addition to specific requirements referred to in the development consent, site operations are to be conducted in accordance with all relevant New South Wales legislation. New South Wales legislation applicable to extraction of hard rock from the Albion Park site includes:

- Protection of the Environment Operations Act, 1997
- Environmental Planning and Assessment Act, 1979
- Heritage Act, 1977
- Local Government Act, 1993
- Mines Inspection Act, 1901
- National Parks and Wildlife Act, 1974
- Occupational Health and Safety Act, 2000
- Roads Act, 1993
- Threatened Species Conservation Act, 1995
- Waste Avoidance and Resource Recovery Act; 2001

- Water Act, 1912

2

THE SITE

2.1 PROPERTY DESCRIPTION

The development consents associated with the quarry extension refer to the following properties:

Property Description	Owner	Activities
❑ Quarry consent		
Lot 1 DP 858245	Bridon Pty Ltd (a Cleary Bros company)	Quarry extension and ancillary works
Lot 23 DP 1039967	Cleary Bros (Bombo) Pty Ltd	Existing site entrance, haul road, processing plant, product storage and sale.
❑ Access Road consent		
Lot 2 DP 858245	Rinker Australia Pty Ltd	New access road and ancillary works
Lot 23 DP 1039967	Cleary Bros (Bombo) Pty Ltd	New access road and ancillary works

The location of these properties is shown on *Figure 2.1*.

Cleary Bros existing quarry is located on Lot 2 DP 1021840. Use of this site together with the contiguous Lot 23 DP 1039967 for quarrying, haul road, processing plant, product storage site entrance and ancillary uses is authorised under earlier development consents that remain current.

2.2 APPROVED EXTRACTION AREA

The approved extraction area is shown on the quarry survey plan, reproduced as *Figure 2.2*. Larger scaled copies of this plan are available. The plan shows an area of 16.96 hectares approved for extraction with the following boundaries:

Base Aerial and Cadastral - LPI and Shellharbour City Council 2003. Aerial Photo date 24/6/2002.

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FIGURE 2.1 Property Plan

Boundary	Identifying Features
West	Aligned along the property boundary with Lot 2 DP 858245
North	Set back 10 metres from the property boundary with Lot 4 DP 3709, except towards the north-eastern corner where the setback is 20 metres to allow for a vegetated bund wall to be constructed.
East	In the north-eastern corner a marked survey line delineates the inner side of the vegetated bund wall. A second marked survey line delineates the outer side of the bund. Towards the southern corner the bund ends and the outer surveyed line continues as the extraction boundary. The survey lines are based on the boundary submitted with the development application and approved by the Court.
South	A marked survey line delineates the southern boundary coinciding with the edge of the extractive industry zoning in Shellharbour Rural LEP 2004.

2.3 APPROVED ACCESS ROAD

The approved route of the access road is shown on the road survey plan, *Figure 2.3*. Larger scaled copies of this plan are available. The plan shows the access road continuing within the quarry extension site. The route shown within the quarry is the initial location of the access road. The road will be realigned within the quarry during subsequent stages of quarrying.

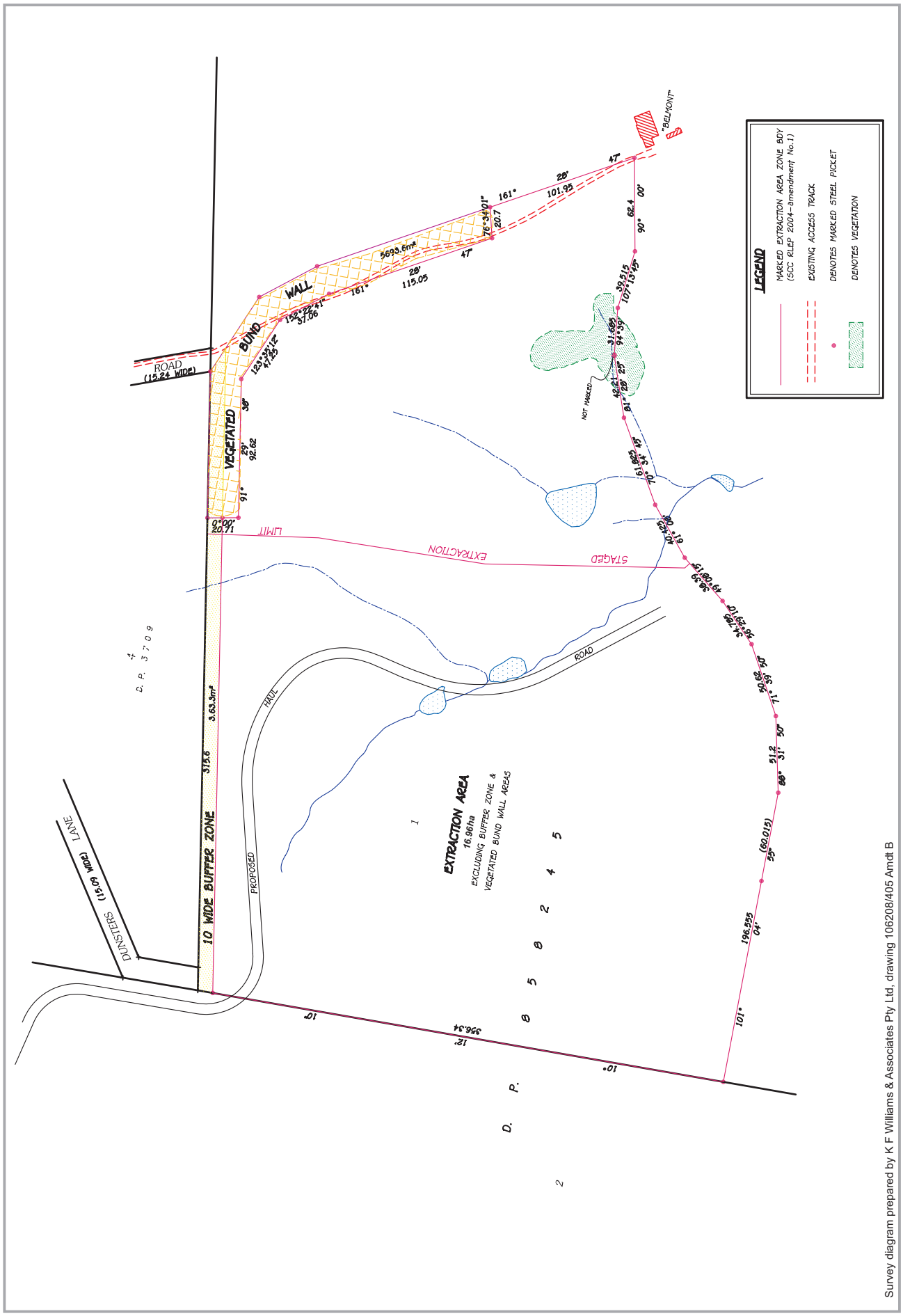
A right of way has been established by agreement over land owned by Rinker Australia Pty Ltd to permit construction of the access road and its use in relation to the quarry extension.

2.4 ZONING AND STATUTORY RESTRICTIONS

The following planning instruments apply to the site:

- Shellharbour Rural LEP 2004;
- Illawarra Regional Environmental Plan No 1 – 1986; and
- SEPP (Mining, Petroleum and Extractive Industries) 2007.

The quarry is located in the City of Shellharbour with the applicable planning instrument being Shellharbour Rural LEP 2004. Most of the land approved for quarrying is zoned 1(x) Extractive Industrial. A narrow strip along the eastern side of the quarry is zoned 1(rl) Rural Landscape where extractive operations are prohibited by the Rural LEP. However, the quarry application was assessed under the since repealed provisions for State significant development. The Minister and subsequently



Survey diagram prepared by K F Williams & Associates Pty Ltd, drawing 106208/405 Amdt B

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FIGURE 2.2 Approved Extraction Area

N 0 100m

the Court, approved extraction and bund construction within the 1(rl) zoned area, as then permitted in the Act for State significant development.

Subsequent to the date of the development consent SEPP (Mining, Petroleum and Extractive Industries) 2007 has come into force, permitting extractive industry to be carried out with development consent on any land where agriculture is permitted.

2.5 ENVIRONMENT PROTECTION LICENCE

The Department of Environment and Climate Change has issued licence No 299 for Cleary Bros existing extractive operation at Albion Park. The licence regulates hard rock quarrying and concrete batching referring to the existing quarry and the processing plant site. An amendment will be required to incorporate the quarry extension onto the new allotment, Lot 1 DP 858245.

A copy of the current licence is included in *Appendix C*.

2.6 ENVIRONMENTAL CHARACTERISTICS

2.6.1 Topography and Drainage

The quarry is located near the crest of the Wentworth Hills in the upper catchment of the Minnamurra River. The land has an altitude ranging from 70 metres AHD in the south to 140 metres AHD in the north. The extraction area is a natural amphitheatre with two spurs extending towards the south along its eastern and western boundaries. Steep slopes drop from the spurlines to watercourses draining to an unnamed creek flowing through the 40-hectare property. The creek is outside the extraction area. Two gauges have been installed to measure flow in the watercourse draining the site and in the unnamed creek upstream of the site discharge.

2.6.2 Geology and Soils

RW Corkery & Co Pty Ltd investigated the geology of the site in 1997 drilling 21 boreholes. Rock strata belong to the Bumbo Latite, referred to as basalt, occurring as two distinct flows separated by tuffaceous agglomerate and overlain by weathered latite and soil. Sandstone underlies the lower basalt flow.

Soil terrain mapping shows the dominant soil type to be a friable reddish brown sandy clay loam topsoil over a subsoil comprising a reddish brown sandy clay or light medium clay. The soils are deep, well structured and free draining but with low

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Figure 2.3 Approved Access Road

fertility. They are strongly acidic with a low to moderate cation exchange capacity and exhibit moderate to high erodiblility.

2.6.3 Climate

A weather station was established at the quarry in 2004. While records are being accumulated from this source, the nearest source of climatic information is Kiama Bowling Club, approximately nine kilometres south east of the quarry. Records have been kept from this recording station since 1897. *Table 2.1* presents a summary of significant data from Meteorological Station No 068038, Kiama Bowling Club.

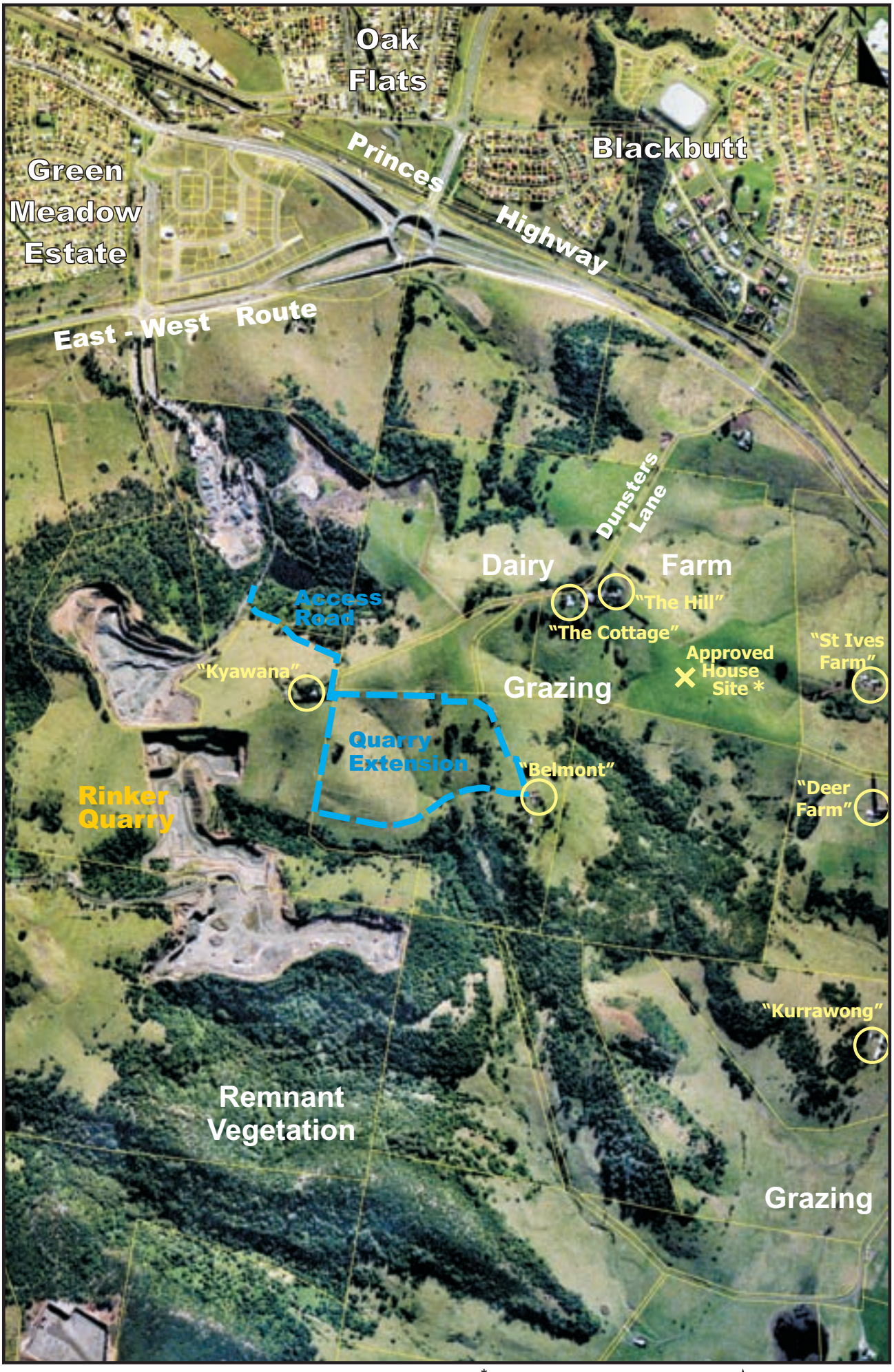
Table 2.1 TEMPERATURE, RAINFALL, HUMIDITY AND WIND SPEED

Item	J	F	M	A	M	J	J	A	S	O	N	D	Year
Temperature Mean Daily Max. Temp. (°C)	25	24.9	24.1	22.1	20.1	17.6	16.8	18.1	19.8	21.7	22.5	23.8	21.1
Mean Daily Min. Temp. (°C)	17.5	17.7	16.4	14.1	12.2	9.3	8.4	8.8	10.6	12.4	14.3	16.3	12.8
Rainfall Mean Monthly Rainfall (mm)	111	119	145	132	121	126	87.6	77.4	75.2	86.7	86.8	94.4	1261
Mean No of Raindays	12.2	11.7	12.7	11.2	10.8	9.8	8.6	8.5	9.2	10.7	11	11.3	127.6
Humidity Mean 9am Rel. Humidity (%)	72	74	71	69	70	65	63	59	60	64	68	70	66
Mean 3pm Rel. Humidity (%)	67	70	67	67	65	58	58	55	58	63	65	66	63
Wind Mean 9am Wind Speed (km/hr)	8.2	8.1	8	8.1	8	10	10.1	9.2	10	9.8	9.1	9.1	9
Mean 3pm Wind Speed (km/hr)	10.8	10.7	10.3	9.1	8.5	9	9.6	11.2	11.7	10.8	11.3	11	10.3

Note: 1. Monthly rainfall entries rounded to three significant figures.

Wind Data

A wind rose from the Albion Park meteorological station included in the quarry EIS shows a predominance for westerlies, occurring some 30 per cent of the time and being more than twice as common as winds from other directions. Northerlies, north-easterlies and southerlies are the next most common. Westerly winds also show the highest proportion of strong winds, followed by north easterlies and southerlies, which show a roughly equal proportion of strong winds.



Base Aerial and Cadastral - LPI and Shellharbour City Council 2003. Aerial Photo date 24/6/2002.

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* Source for house site: Connell Wagner, 2003.

FIGURE 2.4 Surrounding Land Use

2.6.4 *Hydrogeology*

The latite has low horizontal permeability, except in fractured zones. Groundwater seepage occurs through the intervening agglomerate layer and along the contact between the volcanic rock and underlying sandstone. Seepage through the agglomerate layer is collected in existing farm dams. There may also be lateral movement of groundwater from the west following the easterly dipping bedding planes (Golder 1998).

Golder Associates has installed and developed three boreholes on the site for monitoring groundwater levels and quality.

2.6.5 *Surrounding Land Use*

The "Belmont" homestead and residue farmland are immediately east of the extractive area. This property forms part of Cleary Bros' holdings in the area. The balance of the property to the south of the extraction area is partly forested and is to be revegetated/restored to native bushland as part of the quarry project.

Land immediately west of the site is owned by Rinker Australia Pty Ltd and is being quarried up to the site boundary. Rinker also owns the properties to the south of the site which are also partly quarried. A dairy farm occupies the hill top to the north of the site, referred to as the Figtree Hill land. The farm agists cattle on various adjoining paddocks owned by the quarry companies.

The nearest residences are located on the dairy farm at the crest of the ridge as shown on *Figure 2.4*. "The Cottage" and "The Hill" are approximately 375 metres and 460 metres respectively from the nearest part of the extractive area.

2.6.6 *Natural Vegetation and Fauna*

Kevin Mills & Associates identified five vegetation communities on the site:

- Rainforest – mainly in the valley below the extraction area with some small patches on the eastern slope within the quarry. This is an endangered ecological community under the Threatened Species Conservation Act 1995;
- Open Forest – mostly cleared with scattered remnants remaining. The remnants are part of the Illawarra Lowlands Grassy Woodland community which is also an endangered ecological community under the Threatened Species Conservation Act 1995;
- Lantana shrubland – occurs mostly on the edges of forested areas;
- Sedgeland/Rushland – small patches in farm dams within the quarry area; and

- Non-native grassland – most of the land to be quarried.

There are several plant species of conservation importance in the area, but no threatened fauna species were recorded in the area. Fig trees are to be included in the revegetation plans to maintain habitat for the Grey-headed Flying-fox.

2.6.7 Archaeology and Heritage

Two surveys of Aboriginal archaeology have found no artefacts in the extractive area. A subsequent survey of the access road route in 2007 also found no artifacts. The Wentworth Hills have a long history of dairy farming and quarrying. The house on the neighbouring dairy farm, "The Hill" is a listed heritage item, but will not be physically affected by the project. A heritage management plan has been prepared for the project with archival recording of the "Kyawana" ruin and "Belmont" house having been undertaken. These structures are not listed heritage items and are not physically affected by the project.

2.6.8 Access

Prior to commencement, the only access to the property for investigatory work has been via Dunsters Lane. Once the access road has been constructed it will be the only permitted access to the property for operational purposes.

3

MANAGEMENT RESPONSIBILITY

3.1 ORGANISATION STRUCTURE

The chief executive officer of Cleary Bros (Bombo) Pty Ltd has ultimate responsibility for hard rock extraction at Albion Park. The quarry production manager, is responsible for day-to-day operation of the quarry, reporting to the General Manager Quarries. *Figure 3.1* shows an organisational chart for the company focussing on the line of responsibility for Albion Park hard rock quarry.

When the quarry production manager is absent for any significant length of time (holidays), an acting manager is appointed to take responsibility for site operations.

The staff complement and line of responsibility for the quarry is as follows:

Head Office	❑ Board of Directors; ❑ Chief Executive Officer; ❑ General Manager Quarries
On site	❑ Quarry Production Manager; ❑ Operational staff; ❑ Drivers (as required);

Cleary Bros' Environmental Engineering and Contracts Division supplies the environmental officer, based in head office, who reports to the Chief Executive via the company's Technical Manager.

3.2 EMERGENCY CONTACT DETAILS

The phone number of the weighbridge for business and emergency calls during operating hours is **02 4256 9070**. The 24-hour hot line number is **0408 322 213.**

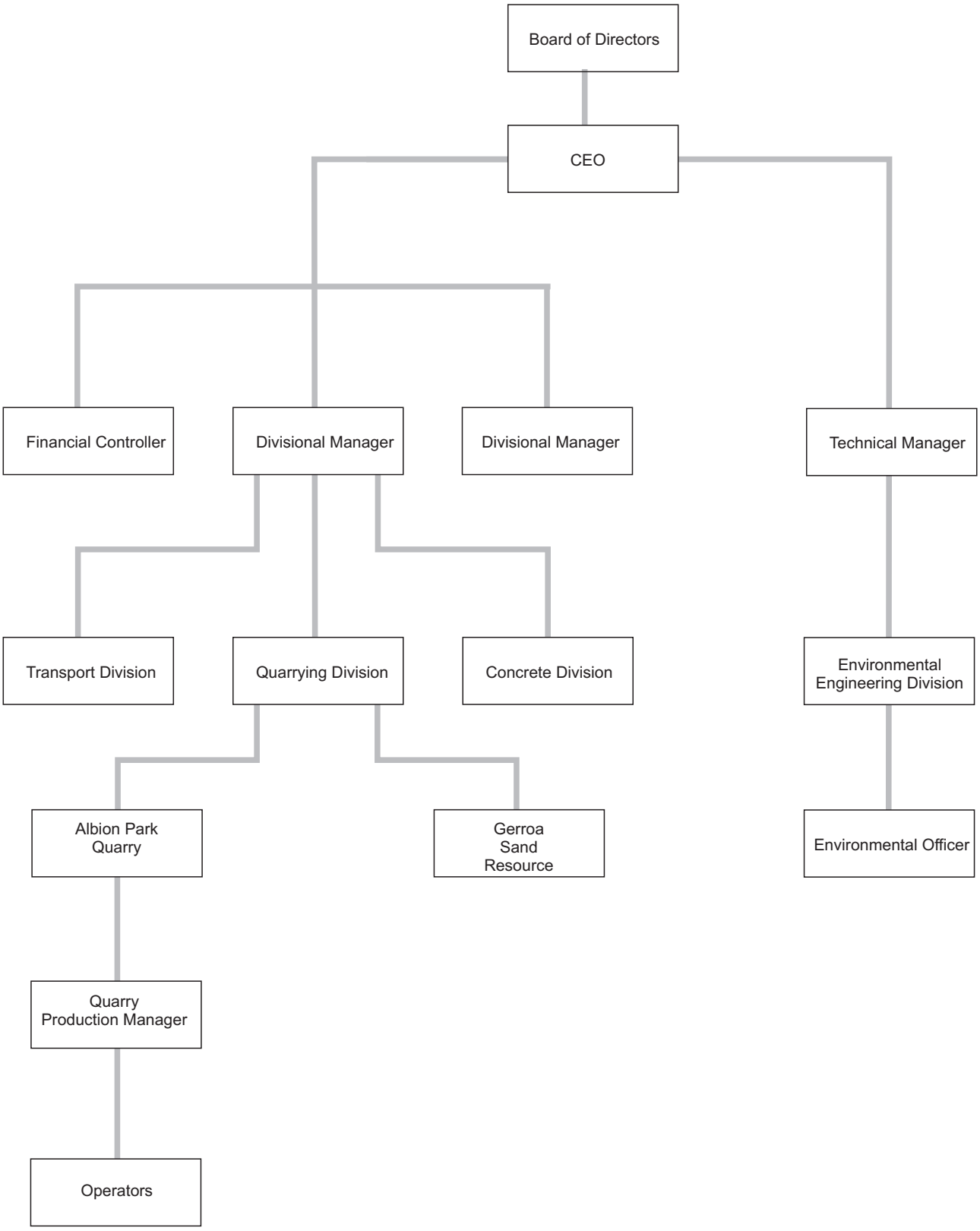

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Figure 3.1 Cleary Bros Simplified Organisation Chart

3.3 ROLE RESPONSIBILITY AND AUTHORITY

Quarry personnel are multi-skilled, undertaking a number of tasks during the course of their work. The formal management roles of staff at various levels is summarised in *Table 3.1*.

Table 3.1 ROLE, RESPONSIBILITY AND AUTHORITY

Task	Chief Executive	General Manager Quarries	Quarry Production Manager (QPM)	Operational Staff	Environmental Officer
Quarry Development	Set objectives, provide broad industry overview, review detailed planning and approval processes.	Assess future needs of the quarry, develop plans, obtain approval, then coordinate and oversee projects to achieve overall objectives.	Assist with long term planning; undertake minor construction projects.	Assist with minor construction projects as required.	Ensure that minor construction and development projects are consistent with approvals; monitor development works for environmental performance.
Rock Production	Review performance of the quarry, assist General Manager Quarries in market development.	Develop markets for hard rock; overview operation of the quarry to ensure production objectives are achieved.	Plan and supervise quarry operation on a daily and longer term basis to produce the required quantity and quality of rock; operate mechanical plant for maximum efficiency	Undertake day to day operational tasks as required	

Task	Chief Executive	General Manager Quarries	Quarry Production Manager (QPM)	Operational Staff	Environmental Officer
Environmental Management	Independently review indicators of environmental performance, confirm compliance with environmental objectives and approvals.	Approve the QEMP and any subsequent amendments; ensure that environmental objectives are understood; monitor quarry operation to confirm compliance	Program work and take corrective action as required to maintain operations within environmental objectives set down in this QEMP. Respond to all incidents and complaints.	Undertake work within guidelines set down by the quarry production manager.	Inspect or internally audit operations at the quarry from time to time and advise the quarry production manager and technical manager of any environmental issues.
Community Liaison	Assist with community relations if major issues arise.	Work with community to ensure that an adequate response is given when environmental issues are raised.	Assist the General Manager as required; participate in all forums where community comment on the quarry is expected.		Attend community monitoring committee meetings; prepare agenda, take minutes and distribute; arrange for all issues to be followed up.
Induction and Training		Ensure that an adequate induction and training program is given to staff	Provide induction and training for all staff. Retain records of all training given.	Attend training sessions conducted by the quarry production manager. If unsure about any aspect of the work, ask the quarry production manager.	Participate in staff induction and training to stress the importance of observing requirements of the QEMP.

Task	Chief Executive	General Manager Quarries	Quarry Production Manager (QPM)	Operational Staff	Environmental Officer
Complaints Register		Review complaints register. Ensure procedures are followed. Provide a response to every complaint. Review effectiveness of corrective action. Ensure records are available for audit.	Record details of any complaints and investigate.. Decide and implement corrective action and provide relevant information to General Manager Quarries.		Confirm that complaints register is up to date for reporting purposes; follow up complaints with environmental issues to see if modifications to the QEMP or additional training is required.
Monitoring		Ensure that the monitoring program is adequate and effectively implemented. Review all results with the QPM. Initiate audits.	Review monitoring results with the General Manager Quarries. Initiate corrective and follow up action where needed.		Undertake or arrange for all monitoring and audits to be completed according to the schedule in this QEMP.
Recording		Ensure that an adequate system of record keeping is being implemented.	Maintain records of quarry operations, including quantities of materials received and dispatched and all monitoring results.		Maintain all monitoring, auditing and environmental reporting records.

Task	Chief Executive	General Manager Quarries	Quarry Production Manager (QPM)	Operational Staff	Environmental Officer
Emergency Action		Intervene at any time where there is an unacceptable risk to safety, or significant environmental damage may occur. Review procedures as required. Ensure that any reports of environmental damage are forwarded to appropriate authorities within timeframes specified in this QEMP.	Take action at any time where there is an unacceptable risk to safety, or significant environmental damage may occur. Arrange remedial measures to overcome the emergency.	Advise the QPM of any suspected risk to safety, or any likelihood of significant environmental damage. Take action as required to prevent emergency situations arising.	provide advice on rectification of environmental damage to Quarry Production Manager and general Manager Quarries, as required. Review reports of environmental damage to ensure appropriate action has been taken and appropriate authorities advised within required timeframes.

3.4 STAFF TRAINING

All staff employed at the site are trained in their responsibilities. The quarry production manager provides training to any new operational staff. The environmental officer may assist to explain the environmental basis for operational procedures. Refresher training is provided as required with a maximum time between training of two years.

4

CONSTRUCTION

4.1 NOTIFICATION TO NEIGHBOURS (Quarry consent: schedule 3, condition 14,)

The owners of the Figtree Hill property are to be notified in writing of the date of commencement of works within the quarry site, at least two weeks prior to that date. This requirement does not apply to works within the access road corridor external to the quarry site.

Shellharbour City Council is to be notified prior to the start of construction work on the access road and Rinker Australia is to be notified prior to the commencement of access road construction within the Rinker property.

4.2 CONSTRUCTION PROJECTS

Construction work includes necessary site preparation prior to commencing hard rock extraction from the quarry extension area. Where actions are specifically required by Conditions of consent, the condition is referenced. The general location of construction works is shown on *Figure 4.1*.

4.2.1 Erosion and Sediment Controls (Quarry Consent: schedule 4, condition 27; Access road consent: conditions 23 and 33)

Erosion and sediment controls will be installed prior to soil disturbance along the access road and on the quarry site. Details of devices to be installed or constructed are shown on the Erosion and Sediment Control Plan. *Figure 4.2* has been derived from the plan to show the location and nature of devices. Full detail for construction purposes is shown on the full sized plan (A1).

4.2.2 Access Road

Initial earthworks will be for the purpose of constructing the access road. The location and design of the access road is shown on *Figure 2.3*. The access road requires cut and fill. Any surplus material will be used in constructing road bunds and the noise/sight bund at the north eastern side of the extraction area, referred to in section 4.2.7.

112R1 20.10.2007

Note: Refer to text for details of each project.

FIGURE 4.1 Location of Construction Works

N 0 100m

Surplus material and topsoil may be stored in the existing quarry. Requirements for vegetation clearing for the access road are described in section 4.2.3. Landscaping requirements are described in section 4.2.8.

The access road is to be the only access to the quarry site during construction and subsequent operation of the quarry. Except in an emergency, all access to the site is to be via the roundabout from the East-West link (Quarry consent: schedule 4, condition 46). If emergency access is required via another route, the Department of Planning and Shellharbour City Council are to be notified as soon as possible seeking their agreement to the action taken.

4.2.3 Vegetation Clearing – Access Road (Access road consent: condition 25)

Clearing for the access road will involve pasture grass and shrubland areas, predominantly weeds but close to some significant vegetation on the lower slope. The access road route passes in proximity to two endangered ecological communities and four significant plant species, one of which is listed as endangered and three are noted as regionally rare.

The access road Vegetation Clearing Protocol (Kevin Mills & Associates 2007) prepared in compliance with condition 25 of the access road consent, has the following requirements for clearing work associated with the access road:

a) vegetation is not to be cleared outside the approved access road corridor;

b) prior to commencing clearing or earthworks, robust fencing will be erected to protect significant vegetation specimens in the locations marked on the ground by Kevin Mills and Associates on 12 September 2007;

c) topsoil will be spread immediately for revegetation rather than stockpiled, if possible;

d) the planting contractor will collect plant propagatory material from the site and provide to a specialist nursery for propagating the plants required for the landscape plan;

e) a weed control strategy will be developed for the location aimed at destroying weeds and ensuring they are not spread with the soil;

f) material identified as useful for revegetation or creating habitat, such as logs, mulch, soil and rocks will be stored for use in rehabilitation;

To inhibit weed propagation, topsoil from the weed patch near "Kyawana" will be buried in one of the bund walls rather than be placed on the surface.

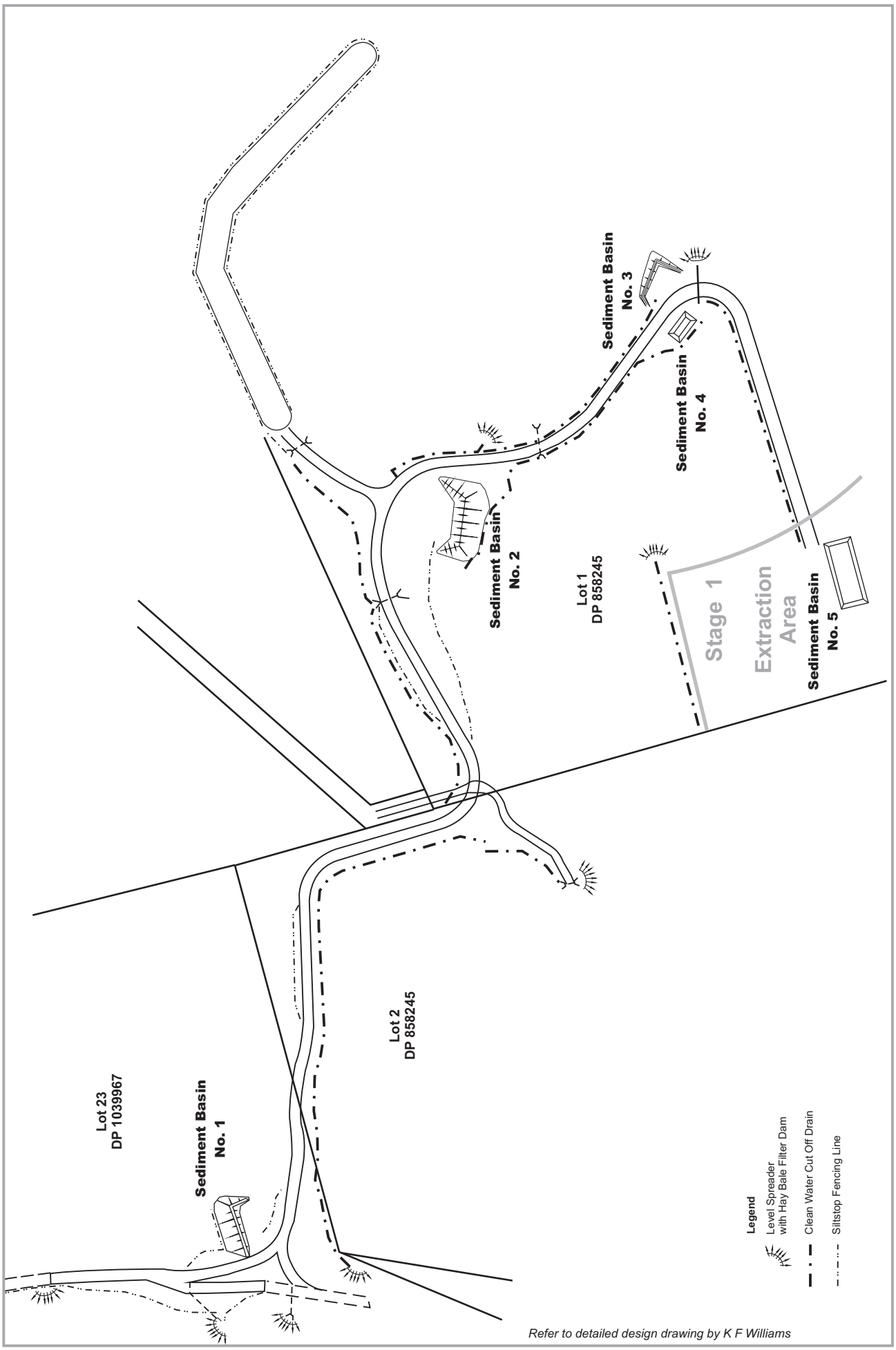


FIGURE 4.2 Erosion and Sediment Controls

4.2.4 Dry Stone Walls (Quarry Consent: schedule 4, condition 51)

Stone pieces from the two dry stone walls affected by the works are to be salvaged and used for constructing a dry stone feature. Details of the requirements for this work are as follows, quoted from the approved Heritage Management Plan, prepared in compliance with condition 51.

1. *Before construction commences on the site an experienced and accredited dry stone waller will be employed who will carry out the following at walls A and B:*

    a. *Removal of any vegetation covering the walls and its disposal.*

    b. *Dismantling of the walls by hand into the bucket of a front-end loader (to keep stone clean and free from soil).*

    c. *Transport the dismantled walls to the new site.*

    d. *Backhoe to prepare the new site for the foundations of the new wall.*

    e. *Sort stone and reconstruct the new wall following the NSW Southern Highlands regional style using the stone from both walls in the one wall.*

2. *Erection of an interpretation sign that outlines the history and origin of the wall including maps and photos of their original locations.*

The stone is to be salvaged prior to any construction work that would disturb the existing walls. Stone wall A is located near the access road to "Belmont" and will be affected by the noise/sight bund. Stone wall B is within the extraction area and may be affected by the haul road descending to the base of the site.

The location for the reconstructed stone structure is not firmly fixed, but the following guidance is given in the Heritage Management Plan:

> *It is considered the location for the reconstruction of the structures should be in an area that highlights the history and associations of the walls to their original location. The entrance to the Cleary Bros' 'Belmont' property would be a location that would both allow the structures to retain their original associations with the area and place them in public view.*

The Quarry Production Manager will determine a location for the reconstructed stone structure having regard to the above guidance.

4.2.5 Fencing and Signage

Prior to commencing preparatory excavations, the quarry site is to be fenced to keep farm animals from the workings. The restoration/revegetation areas to the south of the extraction area are to be fenced off from the remainder of the property for the duration of the quarry life to prevent vehicles inadvertently entering this area. A stock fence will be suitable for this purpose.

Fencing around the extraction area may be confined to the part of the site where work is taking place so the remainder can continue to be used for grazing until it is required for extraction. Fencing is to be fitted with signage warning of the excavation. Locked gates will be included in the fence line at locations determined by the Quarry Production Manager.

Prior to fencing the restoration/revegetation area, any rubbish or old fencing within the area is to be removed. Gates in the fencing to the restoration/revegetation area are to be fitted with signs to advise employees that vehicles are not permitted to enter except for essential maintenance purposes (Vegetation Management Plan – see *Appendix E*).

4.2.6 Clearing and Stripping – Quarry Area (Quarry Consent: schedule 4, condition 34)

Initial clearing in the extraction area is to be confined to removing vegetation and topsoil from land that is about to be disturbed. Such disturbance will occur for road construction, bund construction, drainage, water storage, and the first stage of excavation in the south-west corner. Vegetation to be affected in the initial stage of works is mostly pasture grass. Coral trees and shrubs are to be cleared for the earthen bund at the north eastern corner of the extraction area. When trees or shrubs are encountered they are to be removed from the site. Where practicable debris resulting from native species clearing will be chipped or mulched for use in rehabilitation work.

The Vegetation Clearing Protocol for the quarry (Kevin Mills & Associates 2005) prepared in compliance with Condition 34 of the quarry consent has the following requirements for clearing work associated with the quarry:

g) vegetation is not to be cleared outside the approved quarry site;

h) no longer relevant as a separate protocol applies to the access road (see 4.2.3);

i) clearing is to be carried out in stages, according to the approved quarry plans;

j) prior to clearing any of the rainforest patches an ecologist will inspect the vegetation for plant propagatory material, material that could be used in revegetation (logs, mulch, soil, rocks), recently colonised plants and any special fauna habitats;

k) if special fauna species or habitats are identified in pre-clearing surveys, action recommended by the ecologist will be implemented;

l) plant propagation material collected from rainforest patches will be given to a specialist nursery to produce plants required for the planting program;

m) material suitable for revegetation collected from rainforest patches will be directly reused in revegetation or stored for later re-use;

n) if constructed quarry ponds require revegetating, the ecologist is to nominate appropriate wetland plants for collecting from the existing farm dams;

o) topsoil will be spread immediately for revegetation rather than stockpiled, if possible; and

p) prior to clearing any part of the land, a weed control strategy will be developed for the location aimed at destroying weeds and ensuring they are not spread with the soil.

None of the rainforest patches are to be cleared as part of the initial construction clearing for the quarry. The requirements of the quarry vegetation clearing protocol relevant to initial construction work are items a), c), i) and j).

4.2.7 Noise/Sight Bund (Quarry Consent: schedule 4, conditions 3 and 57)

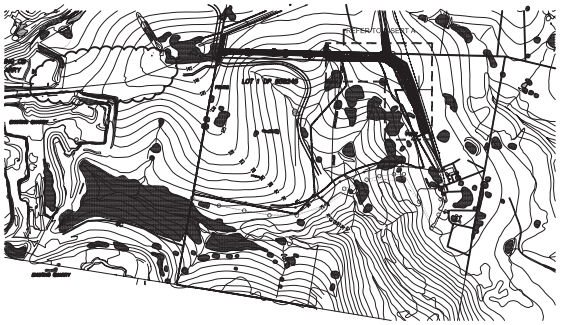
The 350-metre long earthen bund in the north eastern corner of the site will be completed as quickly as possible. Condition 3 of the quarry consent requires that all reasonable efforts be made to complete the bund within six months of commencement of site works and that extraction may not commence until the bund is completed. This bund will be constructed using surplus excavated material from the access road and material from the upper layer of overburden covering the first stage of extraction. The top of the bund will be approximately three metres above natural ground level along its centre line. The designed height may vary according to the topography traversed.

Following construction of the noise/sight bund and prior to landscaping, an independent review of its effectiveness is to be undertaken in accordance with Condition 57 of the quarry consent. The report from the review is to be promptly forwarded to the Department of Planning. Should the Director-General require any improvements they are to be immediately undertaken, prior to landscaping.

4.2.8 Landscaping and Screen Planting (Quarry Consent: schedule 4, condition 55; Access road consent: condition 43)

Following completion of earthworks on the access road all batters are to be hydromulched as shown on the access road landscape plan.

Figure 4.3 Landscape Plan - Quarry



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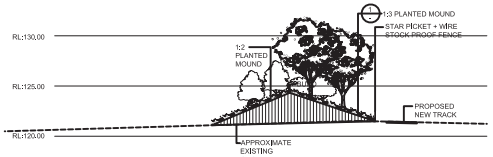

SECTION A-A
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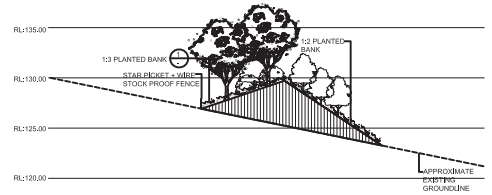

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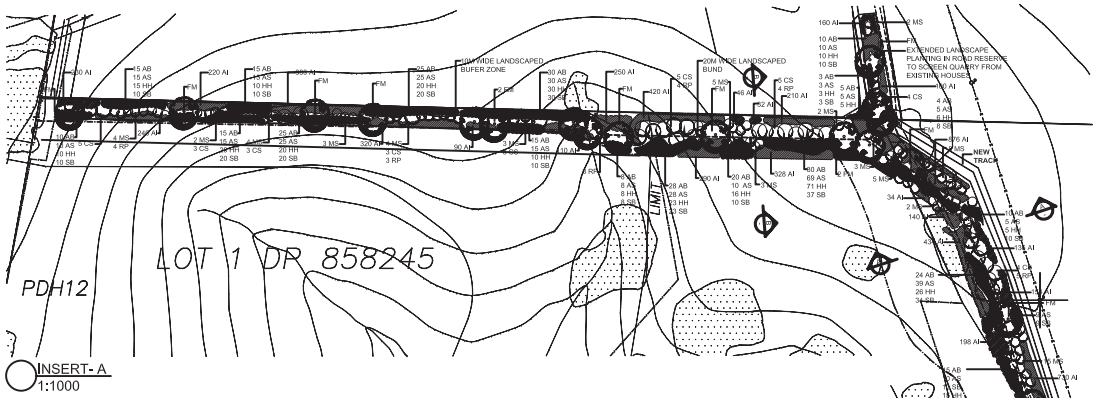
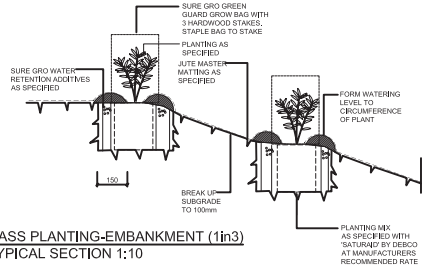


INSERT- A
1:1000



1 MASS PLANTING-EMBANKMENT (1in3)
TYPICAL SECTION 1:10

LEGEND

- SITE BOUNDARY
- EXISTING CONTOUR
- PROPOSED NEW CONTOUR
- EXISTING FENCE
- EXISTING VEGETATION
- FLORA/FAUNA BUFFER LINE
- EXSITING POWER LINE
- EXISTING TRACK
- MASS PLANTING
- BUND AREA
- STAR PICKET + WIRE STOCK PROOF FENCE

PLANT SCHEDULE

Symbol	Botanical Name	No.	Size	Spacing	Stake
GROUNDCOVER					
AI	Alchornea ilicifolia	6426	75 tube	2/m²	sure go bag
SHRUBS					
AB	Acacia binervata	390	75 tube	1/2m²	sure go bag
AS	Acmena smithii	383	"	"	"
HH	Hibiscus heterophyllus	327	"	"	"
SB	Streblus brunionianus	303	"	"	"
TREES					
CS	Callistemon salignus	39	75 tube	as shown	sure go bag
MS	Melaleuca styphelioides	66	"	"	"
FM	Ficus macrophylla	15	300mm	"	"
RP	Rapanea howittiana	25	75 tube	"	"

Note: Plant quantities shown on planting plan take precedence over quantities shown on the plant schedule (to be used as a guide only.) The Landscape Contractor shall ensure that the correct quantities are installed as per the planting plan.

SPECIFICATION NOTES

SERVICES

Before landscape work is commenced, The Landscape Contractor os to establish the position of all services and ensure tree planting is to be carried out at least 3 metres away from these services. Service lids, vents and hydrants shall be left exposed and not covered by any landscape finishes (turfing, paving, garden beds etc.) Finish adjoining surfaces flush with all lids.

PLANT MATERIAL

All plants supplied are to conform with those species listed in the Plant Schedule on the drawings. Generally plants shall be vigorous, well established, hardened off, of good form consistent with species or variety, not soft or forced, free from disease or insect pests with large healthy root systems and no evidence of having been restricted or damaged. Trees shall have a leading shoot. Immediately reject dilled out, damaged or unhealthy plant material before planting. All stock is to be container grown for a minimum of six (6) months prior to delivery to site.

FERTILISER

MASS PLANTING AREAS: Fertiliser shall be 'Nutricote' or approved equivalent in granule form intended for slow release of plant nutrients over a period of approximately nine months. Thoroughly mix fertiliser with planting mixture at a recommended rate, prior to installing plants.
TURFS: Shall be Shirleys No. 17 or approved equal thoroughly mixed into the topsoil prior to placing turf.

TURF

Obtain turf from a specialist grower of cultivated turf. Turf shall be of even thickness free from weeds and other foreign matter, lay in stretcher pattern with joints staggered and close butted. Water immediately after laying.
- TURF TYPE: Kikuyu

WATER RETENTION ADDITIVES

Water retention additives shall be Rain Saver Water Crystal. Apply 1 tea spoon (approx. 40 grams) around tube stock when planting.
Contractor to provide written conformation of order from supplier .

SPECIFICATION-MAINTENANCE PROGRAM

Maintenance shall mean the care and maintenance of the landscape works by accepted horticultural practice as rectifying any defects that become apparent in the landscape works under normal use. This shall include, but shall not be limited to, watering, mowing, fertilising, reseeding, returfing, weeding, pest and disease control, staking and tying, replanting, cultivation, pruning, aerating, renovating, topdressing, maintaining the site in a neat and tidy condition as follows:-

1,0 GENERAL

The Landscape Contractor shall maintain the landscape works for the term of the maintenance (or plant establishment) period to the satisfaction of the Council. The Landscape Contractor shall attend to the site on a weekly basis. The maintenance period shall commence at practical completion and continue for a period of twenty-six (26) weeks.

2,0 WATERING

Grass, trees and garden areas shall be watered regularly so as to ensure continuous healthy growth.

3,0 RUBBISH REMOVAL

During the term of the maintenance period the Landscape Contractor shall remove rubbish that may occur and reoccur throughout the maintenance period. This work shall be carried out regularly so that at weekly intervals the area may be observed in a completely clean and tidy condition.

4,0 REPLACEMENTS

The Landscape Contractor shall replace all plants that are missing, unhealthy or dead at the Landscape Contractor's cost. Replacements shall be of the same size, quality and species as the plant that has failed unless otherwise directed by the Landscape Architect. Replacements shall be made on a continuing basis not exceeding two (2) weeks after the plant has died or been to be missing.

5,0 STAKES AND TIES

The Landscape Contractor shall replace or adjust plant stakes, and tree guards as necessary or as directed by the Landscape Architect. Remove stakes and ties at the end of the maintenance period if so directed.

6,0 PRUNING

Trees and shrubs shall be pruned as directed by the Landscape Architect. Pruning will be directed at the maintenance of the dense foliage or miscellaneous pruning beneficial to the condition of the plants. Any damaged growth shall be pruned. All pruned material shall be removed from the site.

7,0 PEST AND DISEASE CONTROL

The Landscape Contractor shall spray against insect and fungus infestation with all spraying to be carried out in accordance with the manufacturer's directions. Report all instances of pests and diseases (immediately that they are detected) to the Landscape Architect prior to spraying.

8,0 WEED ERADICATION

Eradicate weeds by environmentally acceptable methods using a non-residual glyphosate herbicide (eg: 'Roundup') In any of its registered formulae, at the recommended maximum rate. Regularly remove by hand, weed growth that may occur or occur throughout grassed, planted and mulched areas. Remove weed growth from an area 750mm diameter around the base of trees in grassed areas. Continue eradication throughout the course of the works and during the maintenance period.

Issue	Description	Date
D	Construction Re-Issue	17.09.07
	2. Superseded haul road removed	
C	Construction Issue	26.01.06
B	Client Approval 1. Amendments/existing to the north boundary + road reserve.	20.01.06
A	Client Approval	7.12.05

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project:
Alldon Park Quarry

drawing title:
Landscape Plan

client:
Cleary Brothers Bombo Pty Ltd

scale:	As shown@B1	checked:	IB	drawing no:	revision:
date:	July 2005	job no:	97H08W	L01	D
drawn:	ch	designed:	ch/ib		

Please refer to full size drawings for detail.

Landscape plantings are required in the following locations as shown on the landscape plans for the quarry and access road:

- on the 350-metre long noise/sight bund in the north east corner of the site;
- within the 10 metre wide buffer zone along the northern quarry boundary;
- within part of the road reserve of the existing access road to "Belmont", north of the extraction site;
- on both sides of the access road near its northern end on Lot 23 DP 1039967; and
- on the eastern side of the access road within the right of way on Rinker property near the turning point above the Forest Red Gum trees.

Further landscape plantings to screen the access road may be required after the road is constructed, following joint inspection of its visibility with representatives from Shellharbour City Council (Access Road SEE, visual impact assessment).

Figure 4.3 and *Figure 4.4* are small scale copies of the quarry and access road landscape plans. Full size versions are available for construction purposes.

Landscape plantings associated with the quarry consent are required to commence prior to commencement of extraction and be complete within six months (Quarry consent: schedule 4, condition 55).

4.2.9 Infiltration Trench (Quarry Consent: schedule 4, condition 27)

The Water Management Plan prepared by Golder Associates in compliance with condition 27 of the quarry consent requires construction of a infiltration trench immediately downhill of the extraction area. The purpose of the trench is to allow water to be injected into the upper aquifer to counter the likely draw-down effect of the quarry and thereby maintain existing groundwater conditions for the band of vegetation downhill of the quarry and above the creek line.

The trench will be generally constructed within 10 metres of the quarry edge, sited to minimise the possibility of injected water flowing back into the quarry. The trench should follow the contours to have a level base, but if the side slope makes this impractical then several shorter trenches will be constructed. The trench excavation will be approximately 1.5 to 2 metres deep with a slotted pipe at the base, backfilled with gravel. Access pits shall be included as required for maintenance. Water injection is to occur at several locations for more uniform infiltration.

The first section of the trench and necessary pipework for injecting water will be installed during the construction phase, adjacent to the Stage 1 excavation area. This work should be complete prior to planting trees and shrubs in the restoration area (see below).

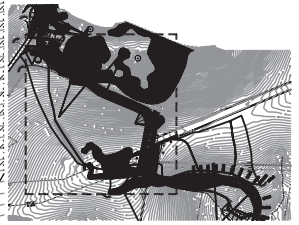
Figure 4.4 Landscape Plan - Access Road

PLANT SCHEDULE

Symbol	Botanical Name	No.	Size	Spacing	Stake
TREES					
AI	Acacia implexa	162	75 tube	as shown	sure gro bag
AMa	Acacia maidenii	162	"	"	"
AMe	Acacia mearnsii	162	"	"	"
AE	Alphitonia excelsa	162	"	"	"
CT	Cleradendrum tomentosum	162	"	"	"
▲	Eucalyptus quadrangulata	11	"	"	"
■	Eucalyptus tereticornis	6	"	"	"
◆	Ficus macrophylla	5	"	"	"
●	Ficus rubiginosa	2	"	"	"
GSa	Grevillea sarcobotrya var. latifolia	162	"	"	"
GSe	Guioa semiglauca	162	"	"	"
HH	Hibiscus heterophyllus	162	"	"	"
PR	Pittosporum revolutum	162	"	"	"
PU	Pittosporum undulatum	162	"	"	"

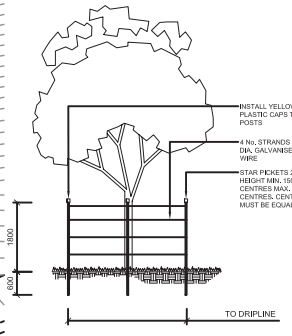
Note: Plant quantities shown on planting plan take precedence over quantities shown on the plant schedule (to be used as a guide only.) The Landscape Contractor shall ensure that the correct quantities are installed as per the planting plan.

KEYPLAN

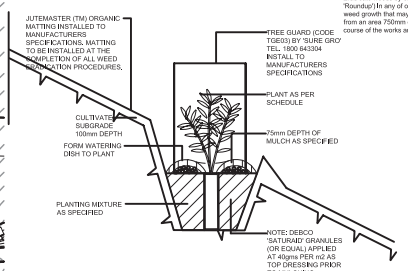


LEGEND

- SITE BOUNDARY
- EXISTING CONTOUR
- EXISTING VEGETATION
- PROPOSED VEGETATION REFER TO DETAIL
- EXISTING TREE TO BE RETAINED REFER TO DETAIL
- HYDROMULCH AREA REFER TO SPECIFICATION



1 TREE PROTECTION
SCALE 1:50



2 TUBESTOCK PLANTING-EMBANKMENT (1in2)
TYPICAL SECTION 1:10

NOTE:

The area where the endangered vine Cynanchum elegans occurs must be avoided. The plants can be found near the nothern end of the route. A GPS recording was taken of the location; 56 0299688 6170771.During the construction period, this area should be temporarily fenced. Refer to L01 Detail1.

SPECIFICATION NOTES

SERVICES

Before landscape work is commenced, The Landscape Contractor os to establish the position of all servicelines and ensure tree planting is to be carried out at least 3 metres away from these services. Service lids, vents and hydrants shall be left exposed and not covered by any landscape finishes (turfing, paving, garden beds etc.) Finish adjoining surfaces flush with pit lids.

PLANT MATERIAL

All plants supplied are to conform with those species listed in the Plant Schedule on the drawings. Generally plants shall be vigorous, well established, hardened off, of good form consistent with species or variety, not soft or forced, free from disease or insect pests with large healthy root systems and no evidence of having been restricted or damaged. Trees shall have a leading shoot, Immediately reject dried out, damaged or unhealthy plant material before planting. All stock is to be container grown for a minimum of six (6) months prior to delivery to site.

FERTILISER

TUBESTOCK PLANTING: Fertiliser shall be 'Nutricote' or approved equivalent in granule form intended for slow release of plant nutrients over a period of approximately nine months. Thoroughly mix fertiliser with planting mixture at a recommended rate, prior to installing plants.

HYDROMULCH

PRODUCT: Bonded Fibre Matrix
SUPPLIER: Grassmaster (ph) 0246478590

WATER RETENTION ADDITIVES

Water retention additives shall be Rain Saver Water Crystal. Apply 1 tea spoon (approx. 40 grams) around tube stock when planting.
Contractor to provide written conformation of order from supplier .

SPECIFICATION-MAINTENANCE PROGRAM

Maintenance shall mean the care and maintenance of the landscape works by accepted horticultural practice as rectifying any defects that become apparent in the landscape works under normal use, This shall include, but shall not be limited to, watering, mowing, fertilising, reseeding, returfing, weeding, pest and disease control, staking and tying, replanting, cultivation, pruning, aerating, renovating, topdressing, maintaining the site in a neat and tidy condition as follows:-

1.0 GENERAL

The Landscape Contractor shall maintain the landscape works for the term of the maintenance (or plant establishment) period to the satisfaction of the Council. The Landscape Contractor shall attend to the site on a weekly basis. The maintenance period shall commence at practical completion and continue for a period of twenty six (26) weeks.

2.0 WATERING

Grass, trees and garden areas shall be watered regularly so as to ensure continuous healthy growth.

3.0 RUBBISH REMOVAL

During the term of the maintenance period the Landscape Contractor shall remove rubbish that may occur and reoccur throughout the maintenance period. This work shall be carried out regularly so that at weekly intervals the area may be observed in a completely clean and tidy condition.

4.0 REPLACEMENTS

The Landscape Contractor shall replace all plants that are missing, unhealthy or dead at the Landscape Contractor's cost. Replacements shall be of the same size, quality and species as the plant that has failed unless otherwise directed by the Landscape Architect. Replacements shall be amde on a continuing basis not exceeding two (2) weeks after the plant has died or is seen to be missing.

5.0 STAKES AND TIES

The Landscape Contractor shall replace or adjust plant stakes, and tree guards as necessary or as directed by the Landscape Architect. Remove stakes and ties at the end of the maintenance period if so directed.

6.0 PRUNING

Trees and shrubs shall be pruned as directed by the Landscape Architect. Pruning will be directed at the maintenance of the dense foliage or miscellaneous pruning beneficial to the condition of the plants. Any damaged growth shall be pruned. All pruned material shall be removed from the site.

7.0 PEST AND DISEASE CONTROL

The Landscape Contractor shall spray against insect and fungus infestation with all spraying to be carried out in accordance with the manufacturer's directions. Report all instances of pests and diseases (immediately that they are detected) to the Landscape Architect prior to spraying.

8.0 WEED ERADICATION

Eradicate weeds by environmentally acceptable methods using a non-residual glyphosate herbicide (eg: 'Roundup') in any of its registered formulae, at the recommended maximum rate. Regularly remove by hand, weed growth that may occur or recur throughout grassed, planted and mulched areas. Remove weed growth from an area 750mm diameter around the base of trees in grassed areas. Continue eradication throughout the course of the works and during the maintenance period.

Issue	Description	Date
B	Construction Certificate	17.09.07
A	Client Approval	21.09.07

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project
Proposed Access Road
Lots 1, 2 and 3 DP 850245
Albion Park Quarry, Albion Park

drawing title
Landscape Plan and Details

client:
Cleary Brothers Bombo Pty Ltd

scale: as shown@B1	checked: BI	drawing no:	revision:
date: 06.06.07	job no: 05-0508R	L01	B
drawn: KP	checked: BI/KP		

Please refer to full size drawings for detail.

4.2.10 Revegetation/Restoration (Quarry consent: schedule 4, conditions 35, 36 & 37)

Conservation, revegetation and restoration are required for land to the south of the extraction area shown in Appendix 1 of the quarry consent. This land is partly covered with remnant native vegetation and partly cleared. The native vegetation is partly degraded with weeds, but includes remnants of two endangered ecological communities. Appendix 1 of the quarry consent is reproduced here for reference as *Figure 4.5*.

During the construction phase, revegetation and restoration works are to commence in the designated land south of the extraction area shown on *Figure 4.5* and described in the Quarry Vegetation Management Plan, *Appendix E* of this QEMP. This work will be ongoing through the life of the quarry and is therefore presented in detail in section 5 of the QEMP dealing with site operations.

4.2.11 Rehabilitation

In the context of construction work, rehabilitation refers to making good land that is disturbed for construction that will not be further disturbed during ongoing operations. Disturbed surfaces will be stabilised as described in the erosion and sediment control plan or landscaped as described in the landscape plan.

Long term site rehabilitation and closure, referred to in conditions 39, 40 and 41 of the Quarry consent and condition 34 of the Access road consent, will be an operational matter and is presented in section 5 of the QEMP dealing with site operations.

4.2.12 Dilapidation Surveys (Quarry Consent: schedule 4, condition 51)

With the consent of the landowners, baseline dilapidation surveys are to be carried out on the residences on the adjoining Figtree Hill land and the "Belmont" property. Condition 51 requires the surveys to be undertaken at least prior to the commencement of each stage of extraction. The first dilapidation survey is to be completed before the end of the construction phase of the development.

Because of the need for ongoing surveys this item reappears as an operational requirement in section 5 of the QEMP.

4.2.13 Monitoring Equipment

Additional dust measuring devices as discussed below will be installed prior to or during the construction phase. The locations are shown on *Figure 7.1*. Existing

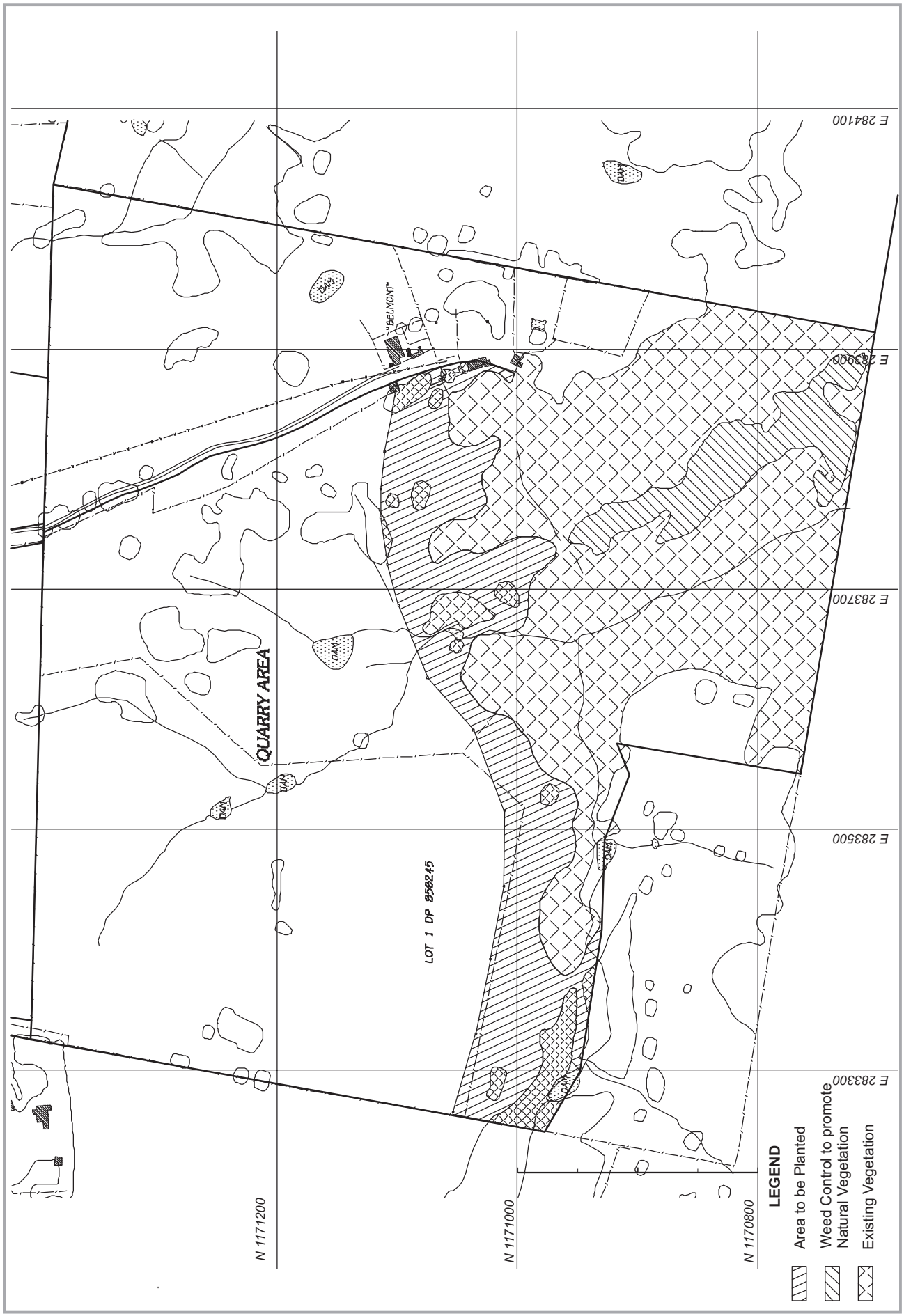

FIGURE 4.5 Revegetation / Rehabilitation Area

monitoring equipment including boreholes, flow gauges, dust gauges, blast monitor, weather station and air sampler, will continue to be maintained and data gathered.

The Dust Management Plan (Quarry consent: schedule 4, condition 20) requires that a telemetering system be fitted to the existing weather station to notify the quarry manager when winds in excess of 5.4 metres per second are experienced for more than 15 minutes. The plan also requires, subject to owner agreement, that a real time light scattering monitor with telemetering capability be temporarily installed near *The Cottage* on the Figtree Hill land for six continuous months of monitoring at various stages during the quarry life (refer to section 7). The existing high volume air sampler is to be fitted with a PM_{10} size selective inlet. A third dust deposition gauge is to be installed within the company's land near the access road to *Belmont*.

The blast monitoring plan requires that the existing blast monitor near *The Cottage* on the Figtree Hill land be permanently installed and fitted with a remote communications link. This will be carried out subject to landowner agreement.

4.3 CONSTRUCTION ENVIRONMENTAL MANAGEMENT

During construction work the following environmental management controls are to be implemented in accordance with conditions of consent and as required to minimise environmental impacts.

4.3.1 Hours of Construction (Quarry consent: schedule 4, conditions 5 and 6; Access road consent: conditions 17 and 18)

Construction work is restricted to the following hours:

- Monday to Friday: 7 am to 5:30 pm
- Saturdays: 7 am to 1 pm
- Sundays & holidays: No work

4.3.2 Construction Noise (2003 EIS)

Construction of the quarry noise/sight bund will be the most significant activity with regard to construction noise. Noise from this temporary activity was modelled for the EIS and shown to exceed the noise goal for the site. For this reason, the EIS specifies that a construction noise management plan be developed in consultation with affected residents. It is proposed to manage construction noise as follows:

- undertake the work as quickly as possible to shorten the period of disturbance;

- select plant and equipment with sound power levels that do not exceed levels used in noise modelling (refer to *Appendix D*);
- operate and maintain plant and equipment to minimise noise;
- limit construction to the approved hours of 7 am to 5.30 pm Monday to Friday and 7 am to 1 pm Saturday; and
- monitor construction noise to confirm objectives in the management plan are being met.

Prior to the commencement of construction work the occupants of the Figtree Hill property are to be contacted and the sequence of construction work discussed together with the likely noise implications. The construction noise management plan includes the above listed measures and any additional matters agreed with the residents following that consultation.

4.3.3 Dust Controls

Earthworks associated with construction work are subject to standard dust control practices contained in the Dust Management Plan. In particular:

- the haulage route for material used in constructing the noise/sight bund will be kept moist whilst in use;
- vehicles hauling materials across the site will be confined to a single route; and
- to minimise wind blown dust, the bunds will be stabilised with mulch and revegetated as soon as practicable following completion of earthworks.

4.3.4 Soil and Water Management

Construction works will be protected with erosion and sediment controls as described in section 4.2.1 above. The installed devices and drains are to be regularly maintained as specified in the Erosion and Sediment Control Plan.

Embankments and other disturbed areas that are not subject to quarrying will be stabilised within seven days of formation as described in the Erosion and Sediment Control Plan.

4.4 VERIFICATION OF CONSTRUCTION COMPLIANCE

(Quarry consent: schedule 3, clause 13; Access road consent: condition 3)

Prior to the commencement of quarry operations, an independent person or organisation is to certify in writing to the satisfaction of the Director-General that all

conditions of the development consent have been complied with up to that point. The independent person is to be approved by the Director-General in writing.

Prior to commencing use of the access road, the Principal Certifying Authority (Shellharbour City Council) must issue a certificate verifying all conditions have been satisfied.

5

ENVIRONMENTAL MANAGEMENT

The environmental management requirements included in this section of the QEMP are auditable at each scheduled external audit and should be reported upon in the annual environmental management report (refer to section 8). References to the "Quarry consent" refer to the development consent for the quarry issued by the Land and Environment Court on 21 February 2006. References to the "Access road consent" refer to the development consent for the access road determined by Shellharbour City Council on 10 May 2007.

5.1 BOUNDARY OF OPERATIONAL AREA (Quarry consent: schedule 3, condition 1)

The approved limit of extraction is shown on the survey plan *Figure 2.2*. A full sized copy of this plan is available. The boundaries are to be clearly and permanently marked at all times in a manner that is obvious to operating staff and inspecting officers. Audit reports should verify that the boundaries remain clearly marked and that extraction remains within the boundaries.

5.2 STAGING

5.2.1 Stages 1 to 4 (Quarry consent: schedule 3, condition 5)

Figure 5.1 shows the six stages of the quarry as proposed in the 2003 EIS, adjusted to show the southern boundary as modified by the consent, the 10 metre buffer along the northern boundary and the minor alteration in alignment of the access road deriving from the subsequent Council consent. Development consent for the quarry has been issued for stages 1 to 4 only.

5.2.2 Stages 5 and 6

A separate development approval will be required before proceeding into stages 5 and 6. Until that approval is received the area of land affected by stages 5 and 6 is to be fenced off from stages 1 to 4 and not used for any purpose associated with the quarry, except for access to the noise/sight bund in the north-east corner, the revegetation/restoration area to the south of the site and monitoring devices. Audit reports are to verify that this is thecase.

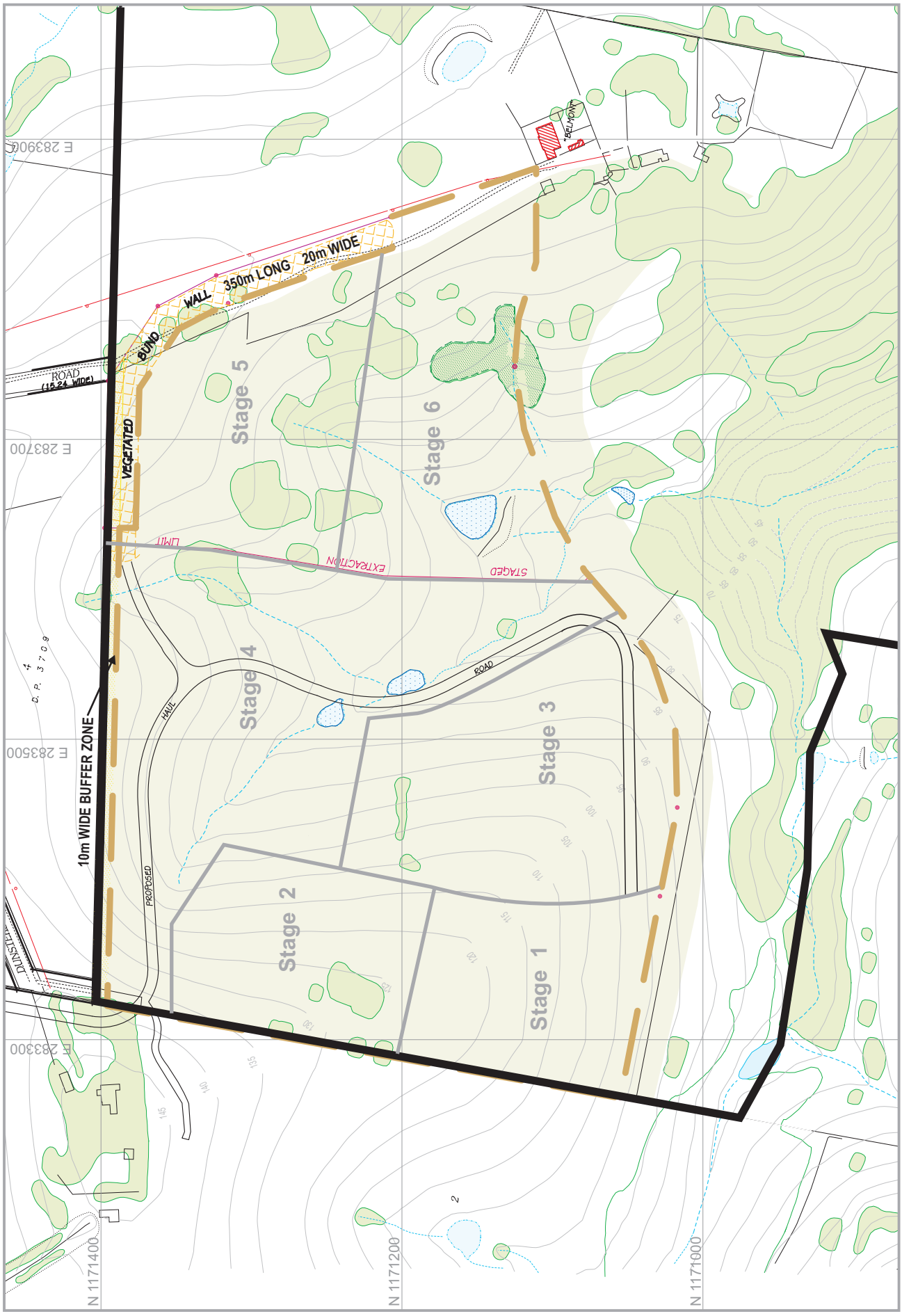

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FIGURE 5.1 Staging Plan

N 0 100m

Development approval for stages 5 and 6 does not require a separate development application. Instead a report is to be submitted to the Minister as described in Schedule 3, Condition 6 of the quarry consent.

5.3 DURATION OF OPERATIONS (Quarry consent: schedule 3, condition 7; Access road consent: condition 12)

The quarry development consent lapses 30 years after the date of determination. The consent was determined on 21 February 2006.

The access road consent provides that the use of the land for quarry access and haul road shall cease 30 years after the date of determination of the quarry consent. The road may be used for a further five years for the purposes of rehabilitation.

5.4 PRODUCTION LIMIT

5.4.1 Performance Objective

Source - Quarry consent: schedule 3 ,conditions 8 and 9

Requirement - Production of quarry products from the quarry is limited to a maximum of 400,000 tonnes per annum.

Verification - Annual production data is to be provided to the Department of Primary Industries and included in the annual environmental management report.

The Environment Protection Licence places no further restriction. The licence applies to hard rock quarrying producing from 100,000 to 500,000 tonnes per year.

5.5 NOISE LIMITS

5.5.1 Performance Objective

Source - Quarry development consent: schedule 4, conditions 4, 8 and 9; Access road consent: conditions 16, 17 and 18. (identical)

Requirement - Operational noise generated by the development must not exceed criteria specified in *Table 5.1* under conditions of wind speeds (10 metres above ground) of up to 0.5 metres per second and under temperature gradients of up to $0^{o}C$ per 100 metres (Condition 4).

Verification - Noise measurement to be undertaken at the most affected point on the receptor boundary or within 30 metres of the dwelling where the dwelling is more than 30 metres from the boundary. Measurements to be undertaken by a qualified person within eight weeks of commencing extraction and annually thereafter. Results to be submitted to DECC and the Director-General within three months (Condition 8). Noise monitoring procedures are included in the noise monitoring plan and summarised in section 7 of this QEMP.

Notification - Within seven days of detecting an exceedence of a noise limit in *Table 5.1*, the exceedence is to be reported to DECC, the Director-General and the owner of the property. (refer to Condition 9 for details).

Table 5.1 NOISE LIMITS

Receiver Locations	**Noise Limits $L_{Aeq15minute}$**		
	Stages 1-2	**Stages 3-4**	**Stages 5-6**
"The Hill" residence (Dunster premises)	35	38	35
"The Cottage" residence (Dunster premises)	35	38	35
Approved rural worker's dwelling (Dunster premises)	35	38	35
Greenmeadows residential estate	41	41	41

5.5.2 Design Features

(i) A noise/sight bund, 350 metres long and approximately three metres high, is to be constructed at the north-eastern corner of the extraction area along the northern and eastern boundary. This bund is designed to attenuate noise transmission in the direction of the residences and approved rural worker's dwelling on the Figtree Hill property.

5.5.3 Management Procedures

(i) Confine work to the approved operating hours (see 5.6 below)

(ii) Maintain plant and equipment so that sound power levels specified in *Appendix D* are not exceeded.

5.6 OPERATING HOURS (Quarry consent: schedule 4, conditions 5 and 6; Access road consent: conditions 17 and18)

Operating hours for all external activities except blasting (where there are more stringent controls) are limited as follows: (Condition 5):

- 7.00 am to 5:30 pm Monday to Friday;
- 7.00 to 1.00 pm Saturdays;
- no operation on Sundays or public holidays.

Exceptions to the above limits are as follows (Condition 6):

- delivery of materials as requested by the police or other authorities for safety reasons;
- emergency work to avoid loss of life, property or to prevent environmental harm;
- workshop activities and other maintenance work inaudible at the nearest affected receiver.

5.7 BLASTING

5.7.1 Performance Objective

Source - Quarry development consent: schedule 4 ,conditions 10, 11 and 12 and Blast Management Plan (Condition 14)

Requirement - Airblast overpressure and peak particle velocity from blasting must not exceed criteria specified in *Table 5.2*. Blasting may only take place between 9 am and 5 pm Monday to Friday and is limited to one blast per day unless otherwise approved by DECC.

Verification - Blast monitoring procedures are described in the Blast Management Plan and summarised in section 7 of this QEMP.

Table 5.2 BLASTING LIMITS

Maximum Airblast Overpressure dB(Lin Peak)	**Maximum Peak Particle Velocity** mm/s	**Allowable Exceedence**
1. At any point located at least 3.5 metres from any residence on privately owned land		
115	5	5% of the total number of blasts over any 12 month reporting period.
120	10	0%
2. At the southern boundary of the Figtree Hill land		
135	200	0%

5.7.2 Design Features

(i) Blasting is offset from the northern property boundary by the 10 metre planted buffer.

(ii) For the initial stages of extraction the haul road is located close to the northern boundary of the extraction area further separating blasting from the property boundary (refer to the sketch in Appendix 3 of the quarry development consent – subsequent redesign of the access road has provided greater separation from the boundary).

5.7.3 Management Procedures

(i) The following blast design parameters are to be implemented for each blast, subject to review as indicated in (vi) below:

- Direction of detonator initiation is away from nearest residence;
- All blast faces are to be oriented generally to the south;
- Each hole is to have 1.5 metres of solid decking;
- Two or more columns of explosives of equal length per blast hole;
- Two detonators per blast hole;
- Explosive columns are to be initiated from the bottom;
- Blast holes are to be 76 mm diameter;
- Minimum stemming depth is 2.2 metres;
- Subdrill 1.2 metres for both production and overburden blasts;
- Bench height is to be between 7 and 12 metres;
- Minimum front row burden is to be 2.2 metres;
- Minimum spacing is 2.2 metres.

(ii) For the first 20 blasts the maximum instantaneous charge (MIC) is to be restricted according to the lower result derived from the following formulae:

$$MIC\ (kg) = [(Distance\ to\ nearest\ receiver\ (m))/152.8]^3$$

$$MIC\ (kg) = (Distance\ to\ nearest\ receiver\ (m))^2/4{,}719$$

(iii) Blast emissions data collected from the first 20 blasts are to be used to revise the predicted blast emissions site laws included in the Blast Management Plan to generate more accurate site laws based on the measured characteristics of the site.

(iv) Thereafter MIC for each blast is to be calculated in accordance with the revised blast emissions site laws.

(v) Blast emissions site laws will be further revised over the life of the quarry using blast emissions data from completed blasts.

(vi) Blast design will be refined from time to time using the updated site laws, particularly when operating close to the northern property boundary.

(vii) For blasting within 60 metres of the northern property boundary, the MIC from each blast is to be restricted to below 18 kilograms or as otherwise indicated by the revised site laws, to maintain airblast overpressure below 135 dB(Lin) at the boundary.

(viii) To minimise flyrock, the front row of blast holes is to be "boretraked" to identify any areas of unsatisfactory burden. Any such blast holes are to be filled with inert material rather than explosives.

(ix) Also to minimise flyrock, aggregate will be used as the stemming material rather than drill dust.

(x) When blasting within 20 metres of the northern boundary, a one metre layer of overburden will be left in place on top of each shot and blast mats will be installed over the blast.

(xi) Meteorological data is to be evaluated as close as possible to the time of blasting to determine if blasting should proceed.

(xii) Blasting is to be avoided where possible if winds are blowing towards the nearest receptor at sufficient strength to enhance impacts, if there is heavy low level cloud or where a temperature inversion is present.

(xiii) All affected landowners or occupiers within 500 metres of a blast are to be notified of the expected time of firing by telephone on the morning of the blast.

(xiv) When planning a blast within 50 metres of the northern boundary, the owners of the Figtree Hill land are to be notified in writing at least 48 hours prior to firing and again by telephone on the morning.

(xv) Blasts will be conducted at the same time each day where possible. Should Readymix be blasting on the same day, the blasts shall be adequately separated in time.

5.8 AIR QUALITY

5.8.1 Performance Objective

Source - Quarry development consent: schedule 4 ,conditions 16, 17 and 18 and Dust Management Plan (Condition 20);
Access road consent conditions 19, 20 and 21.

Requirement - Air quality criteria specified in *Table 5.3* must not be exceeded at any sensitive receiver or residence on privately-owned land. The site must be maintained in a condition that minimises dust emission, including prompt and effective rehabilitation of all disturbed areas. Unsealed roadways, quarry floor and stockpiles are to be watered as necessary to minimise dust impacts on the natural and built environment.

Verification - Dust monitoring procedures are described in the Dust Management Plan and summarised in section 7 of this QEMP.

Table 5.3 DUST LIMITS

Pollutant	**Averaging Period**	**Criterion**	
Total suspended particulate matter (TSP)	Annual	90 µg/m^3	
Particulate matter < 10 µm (PM_{10})	Annual	30 µg/m^3	
Particulate matter <10 µm (PM_{10})	24-hour*	50 µg/m^3	
		Maximum increase	**Total**
Deposited Dust	Annual	2 g/m^2/month	4 g/m^2/month

*Note: For continuous PM_{10} monitoring purposes, the Dust Management Plan derives a one-hour average PM_{10} limit of 125 µg/m^3 .

5.8.2 Design Features

(i) The access road follows a route leading away from residences.

(ii) All traffic to or from the quarry passes through the existing processing plant where dust control measures are already implemented.

(iii) The access from public roads to the site is sealed as far as the processing plant weighbridge.

(iv) Where the quarry access road crosses the ridge top it is located in cut, giving some protection from the wind in this exposed area.

5.8.3 Management Procedures

(i) Permanent or long term stockpiles are to be revegetated.

(ii) When south-westerly winds average above 5.4 m/s (critical winds) water sprays will be directed onto any exposed stockpiles on the quarry site.

(iii) A telemetry system is to be fitted to the weather station to notify the Quarry Production Manager when critical winds are sustained for 15 minutes.

(iv) Only one work face shall be permitted on a materials stockpile, where practicable, and shall be wetted down before working.

(v) Stockpiles within the quarry shall not exceed the height of the bund in the north-eastern corner.

(vi) Tipping drop heights will be minimised and waters sprays used on excavator buckets and truck trays during dry and dusty conditions.

(vii) Fine mist sprays will operate when blasting occurs.

(viii) The haul road is to be kept damp at all times when in use, spraying a minimum of 2 litres/m^2/hour with a chemical additive to break the surface tension, if needed.

(ix) All vehicles on site are to be confined to designated roads with a signposted speed limit.

(x) Trucks leaving the site to the public road system are to have covered loads, with tailgates effectively sealed.

(xi) Miscellaneous dust sources such as spillages from trucks and silt from sediment controls are to be regularly cleaned up.

(xii) Burning is not permitted on the site.

5.9 WATER MANAGEMENT

5.9.1 Performance Objective

Source - Quarry development consent: schedule 4 ,conditions 22, 23, 24, 25, 26 and Surface Water and Groundwater Management Plan and Soil and water Management Plan (Conditions 27 to 32);
Access road consent conditions 22 and 23.

Requirement
- Section 120 of the Protection of the Environment Operations Act 1997 must be complied with at all times.
- Any discharges from licensed discharge points must have total suspended solids of not more than 50 mg/litre and pH within the range 6.5 to 8.5.
- The stormwater system is to be designed to capture polluted runoff from a 10 year ARI, 24 hour duration storm (225 mm in 24 hours)
- Within five days of a rainfall event, stormwater basins are to be
- treated and emptied to maintain storage capacity.
- Written approval from DECC is required to use a flocculent other
- than gypsum

Verification
- Monitoring and environmental site audit

5.9.2 Design Features

(i) Erosion and sediment controls for the access road and first stage of the quarry are included in the erosion and sediment control plan (refer *Figure 4.2*).

(ii) Long term water storage for operational purposes is designed to occur in the base of the excavation, which is not free draining.

(iii) During the early years of operation and during dry spells water will be sourced from the large dam associated with the existing quarry and processing plant.

(iv) When collected water is available, water is to be periodically released from the quarry to the creek system to mirror natural pre-quarry flows.

(v) Collected water is to be reinjected to groundwater should monitoring show that groundwater levels are declining as a result of quarrying. An infiltration trench is to be installed for this purpose (refer to *Figure 4.1* and the Surface Water and Groundwater Management Plan – Golders 2005)

5.9.3 Management Procedures

(i) Install and maintain erosion and sediment controls in accordance with instructions on the approved plans.

(ii) Inspect erosion and sediment controls after each major rain event, repair any damage and ensure correct functioning.

(iii) Remove accumulated silt periodically from sediment traps/basins.

(iv) Refuel plant and equipment at least 100 metres from any water storage.

(v) Test and if necessary, treat water prior to release to the creek system.

(vi) Regularly collect and remove waste and litter from the quarry site.

(vii) Limit fertiliser use on rehabilitation works to minimise nutrient runoff.

5.10 VEGETATION AND FAUNA MANAGEMENT

5.10.1 Performance Objective

Source - Quarry development consent: schedule 4 ,conditions 35, 36, Vegetation Management Plan (condition 37) and Vegetation Clearing Protocol (condition 34)

Requirement
- Conserve and maintain the southern areas of remnant vegetation marked on the map in Appendix 1 of the consent.
- Revegetate the areas marked "Area to be planted" on the map.
- Restore the area marked "Weed control to promote natural vegetation" on the consent map.
- Periodically release water from the quarry storage for environmental purposes

Verification - Environmental site audit.

5.10.2 Design Features

(i) The area to be returned to native forest is to be fenced off from the remainder of the property with a plain wire stock fence to prevent stock access and to ensure that vehicles cannot enter the area randomly without passing through a gate which is signposted to deter entry.

(ii) In the *restoration area*, the primary management objective is to enhance native vegetation by controlling weeds and allowing natural regeneration of native plants to take place.

(iii) In the *revegetation area*, the primary management objective is to establish native vegetation by planting and nurturing native species, being vegetation that is indigenous to the site.

5.10.3 Management Procedures

(i) Spoil or other materials are not to be stored within the area fenced off for protection of vegetation to the south of the quarry.

(ii) Topsoil may be used to improve the growing area in the revegetation area but is not to be used in the restoration area.

(iii) Prior to fencing, all foreign material including dumped rubbish, old fences and farming debris is to be removed from the restoration/revegetation area.

(iv) An induction is to be given to all personnel working on the site stressing that access within the fenced area should normally be on foot and that the area is not to be driven over or disturbed other than where essential for maintenance or monitoring of the restoration/revegetation.

(v) Signs are to be erected on the fence to make it clear the land beyond is being restored/revegetated and that there should be no unauthorised vehicle entry.

(vi) Soil disturbance is to be minimised in the restoration area but may occur in the revegetation area for the purpose of revegetation and weed control.

(vii) Chemical weed control is not to be used in the restoration area, except for painting lantana stumps, but may be used in the revegetation area.

(viii) Plant stock of selected species listed in the Vegetation Management Plan is to be obtained from a nursery that has propagated them from material obtained on the site or in the local area.

(ix) Weeds identified in the Vegetation Management Plan are to be controlled in the restoration/revegetation areas with particular emphasis on African Box Thorn, Lantana and Prickly Pear.

(x) The planting method is as follows:

- plants shall be tubestock or similar small stock;
- water-holding crystals and two tablets of slow-release fertiliser shall be placed in the hole.
- plants shall be watered at the time of planting, with follow-up watering at least weekly until the plants are established.
- plants shall be individually bagged but not staked.
- trees and shrubs are to be planted no more than two metres apart and ground cover plants at a density of two plants per square metre, avoiding any geometric pattern.
- the area around each plant is to be mulched at the time of planting using mulch from the site that is free from viable weed propagation material.

(xi) The following maintenance activities are to be carried out at least quarterly:

- check that fencing is intact;
- carry out weed control;
- water plants as required;
- replace dead plants;
- remove any rubbish;
- treat any erosion or siltation;

- address the impact of animals.

(xii) To maintain the riparian environment in the creek system leading from the quarry, water is to be released from the quarry storage to the creek on a varied basis, mirroring rainfall as far as possible to approximate pre-quarrying conditions.

5.11 REHABILITATION

5.11.1 Performance Objective

Source - Quarry development consent: schedule 4, condition 39 and Rehabilitation Management Plan (condition 40);
Access road consent: condition 34.

Requirement - Progressively rehabilitate the disturbed areas of the quarry site in accordance with the process outlined below, which is the initial rehabilitation management plan.
- Rehabilitate the access road when it is no longer required.

Verification - Environmental site audit

5.11.2 Design Features

(i) Following completion of construction works described in section 4 of the QEMP the remaining disturbed areas on the site for which rehabilitation will be required include the access road formation and the active quarrying area.

(ii) A separate rehabilitation management plan has been prepared for the access road and is included in *Appendix E*.

(iii) Access road rehabilitation will be undertaken at the end of quarrying, in about 30 years, if the road is no longer approved for access to the property.

(iv) Quarry rehabilitation will be undertaken progressively, commencing when the quarrying has moved to the Stage 2 quarrying area, after year 5.

5.11.3 Medium and Long Term Quarry Rehabilitation Measures

(i) In consultation with Shellharbour Council identify the most suitable future use for the land.

(ii) Progressively backfill exhausted areas of the quarry to establish a landform consistent with the agreed future use for the land and to achieve a free draining structure.

(iii) On the sides of the amphitheatre, aim for a final gradient of about one in four with a series of terraces to break up the slope and provide for future access.

(iv) As each area of the backfilled quarry reaches final grade, spread available topsoil and stabilise the surface.

(v) Determine specific surface finishes such as grass, hardstand or vegetation in as appropriate for the agreed final land use and detail them in future revisions of this plan.

5.11.4 Short Term Rehabilitation Measures

It is not anticipated that quarry rehabilitation will commence within the first five years as the Stage 1 extraction area will be in full operation during this period. Rehabilitation will commence when extraction moves into the Stage 2 area in years 6 to 10. This QEMP will be updated to include detailed proposals when land becomes available for rehabilitation, consistent with the development consent.

5.12 TRAFFIC AND TRANSPORT

5.12.1 Performance Objective

Source	-	Quarry development consent, schedule 4: conditions 45 to 50; Access road consent conditions 36 to 39.
Requirement	-	All site access is to be via the roundabout at East-West Link Road
	-	Do not cause any heavy vehicle movements on Dunsters Lane, except in an emergency
	-	Ensure that all loaded vehicles leaving the site are covered
	-	Prevent spillage of quarry material to the public road system.
Verification	-	Environmental site audit

5.12.2 Design Features

(i) The existing access to the quarry/processing plant connects with the East-West Link road at a roundabout.

(ii) The access road from the roundabout to the processing plant weighbridge is sealed.

5.12.3 Management Procedures

(i) Personnel are to be instructed that the quarry site is not to be accessed via Dunsters Lane.

(ii) If Dunsters Lane has to be utilised in an emergency, inform Shellharbour City Council and the Director-General of Planning as soon as possible.

(iii) Sufficient parking is to be available on site for all quarry-related vehicles.

(iv) All loaded vehicles entering or leaving the site to the public road system are to be covered.

(v) Vehicles leaving the site are to be free from material that may fall to the public roadway.

5.13 HERITAGE

5.13.1 Performance Objective

Source - Quarry development consent, schedule 4 ,conditions 51 and 52
Access road consent condition 40

Requirement - Relocation of dry stone walls and baseline dilapidation surveys will occur in the construction phase and are addressed in section 4.
- If any identified relic is likely to be disturbed, firstly obtain an appropriate permit under the Heritage Act or National Parks and Wildlife Act as may be applicable.

Verification - Environmental site audit to confirm dilapidation survey

5.13.2 Management Procedures

(i) Repeat the baseline dilapidation survey of residences on the Figtree Hill land and *Belmont* prior to the commencement of each stage of quarrying.

(ii) Should any artefact be encountered during quarrying that may be of European cultural significance, offer the material to Shellharbour City Council for retention in a museum or as appropriate.

(iii) Should any material be discovered which is suspected to be an Aboriginal artefact, leave the material in situ and have it examined by a qualified archaeologist before determining further action.

5.14 VISUAL IMPACT

5.14.1 Performance Objective

Source - Quarry development consent, schedule 4, conditions 54 to 57 Access road consent conditions 42 to 45.

Requirement - Minimise visual impact from the quarry and access road.

Verification - Environmental site audit.

5.14.2 Design Features

(i) During the construction phase a visual bund, screen planting and landscaping will be provided consistent with the landscape plans, as described in section 4.

5.14.3 Management Procedures

(i) Continue to nurture and maintain vegetation planted on visual bunds and elsewhere for screening and landscaping purposes.

(ii) Augment or renew screening vegetation should its effectiveness deteriorate over time.

5.15 WASTE MANAGEMENT

5.15.1 Performance Objective

Source - Quarry development consent, schedule 4, conditions 58 to 59

Requirement - Minimise waste generation and avoid the site becoming contaminated as a result of waste being disposed thereon.

Verification - Environmental site audit.

5.15.2 Management Procedures

(iii) Waste of any type or quantity that requires a licence issued by DECC for its transport or disposal is not to be brought to the site.

(iv) Waste generated on the site shall be removed to a facility licensed to receive the waste.

5.16 EMERGENCY AND HAZARDS MANAGEMENT

5.16.1 Performance Objective

Source - Quarry development consent, schedule 4, conditions 61 to 65 Access road consent conditions 46 to 47.

Requirement
- Store, handle and transport dangerous goods in accordance with relevant Australian standards.
- Secure the site to ensure public safety.
- Minimise the risk of pollution in the event of a significant threat to the environment.
- Alert relevant agencies and the affected community in the event of significant pollution.
- Ensure that employees are familiar with emergency procedures.
- Integrate emergency management procedures for the quarry with Cleary Bros emergency management plans

Verification - Environmental site audit.

5.16.2 Significant Threats

Significant events at the quarry that may threaten the environment or public health include excessive rainfall, fire, fuel spillage on the access road, blasting mishap, unauthorised access or major truck accident. Other potential occurrences such as landslip, power failure, pump failure, excess flocculation or spillage within the quarry would be unlikely to present a threat to the environment or public health as the effects would be contained within the quarry, allowing rectification to be planned and implemented in a co-ordinated manner.

Should a major pollution incident occur affecting the external environment, DECC will be advised by telephone (131555) as soon as possible and provided with written details within seven days.

5.16.3 Excessive Rainfall

Excessive rainfall means rainfall generating runoff that floods part of the site or exceeds the design capacity of the drainage and sediment control system and creates a potential for severe erosion and for sediment laden water to be released into the environment.

5.16.3.1 Access Road

From the time of first disturbance, earthworks on the site will be protected by erosion and sediment controls. The Erosion and Sediment Control Plan provides for three sediment basins to be constructed beside the access road to collect dirty water and settle suspended matter. These basins have a designed holding capacity based on 225 millimetres of rainfall in 24 hours as specified in condition 24 of the quarry consent. This rainfall equates to a once in ten year 24 hour storm.

On occasions when heavy rainfall produces runoff in excess of the basin design volume, provision is included to spill the excess stormwater after it passes through the basin. The excess runoff will generally have a lesser sediment load than the first flush and will drop much of this material within the basin, reducing sediment carry over to the spillway. The response to excessive rainfall is to monitor the drainage and sediment control system and effect any repairs or maintenance as soon as possible.

In the unlikely event that a sediment basin wall is overtopped or gives way this would be a serious environmental incident requiring notification to DECC as required under section R2 the licence.

5.16.3.2 Quarry Workings

Once extraction has commenced, the quarry excavation will be capable of retaining runoff from all rainfall within its catchment. While excess water may flood the workings and be a hindrance to operations it will not be an emergency situation. The excess will be flocculated if necessary and released as soon as sampling has indicated that it is appropriate to do so.

5.16.3.3 Management Procedures

When excessive rainfall is experienced:

(i) Cease quarrying at the lowest level;

(ii) Check the drainage and sediment control structures for integrity and make any urgent repairs;

(iii) Relocate mobile machinery and moveable plant not required for emergency work, to higher ground, clear of any part of the quarry likely to become inundated;

(iv) Should a major pollution incident occur to the external environment advise DECC as indicated above.

After a major rainfall event:

(i) Inspect erosion and sediment controls and undertake any repairs or maintenance;

(ii) Return mobile plant and clean deposited debris from the access road and operational area of the site;

(iii) Flocculate the storage in the quarry base using gypsum and test for suitability for discharge. If the sediment load is less than 50 mg/litre, pH in the range 6.5 to 8.5 and no visual evidence of hydrocarbons, pump water to natural drainage until a satisfactory working level is reached;

(iv) As time permits, restore any damage to the operational area and rehabilitation works.

5.16.4 Fire

The threat from fire includes equipment fires and grass fires occurring within the property and bushfires threatening the property from external sources. The risk from fire is significantly reduced because the quarry and its access road create extensive fire breaks and hardstand areas.

5.16.4.1 Precautionary Measures

The following steps are taken to minimise the risk of fire and fire damage:

(i) Fire fighting equipment is stored at the site;

(ii) Extinguishers are kept on all mobile plant;

(iii) Staff are trained in fire response procedures;

(iv) No fuel, explosives or other highly combustible material is kept in the quarry;

(v) Cattle grazing is permitted to continue on grassland areas of the site as far as practicable to prevent a high fuel load from developing in those areas;

(vi) The company's work instructions include emergency response procedures, applicable during a fire emergency:

- equipment available on the premises;
- responsibilities of personnel;
- Rural Fire Service contact details;
- weekly visual check and quarterly testing of equipment;
- signposting for fire fighting equipment;
- staff training for fire emergencies.

The bushland area of the property is located downslope of the approved quarry and generally along the creek line. This area contains endangered ecological communities. Under the terms of the development consent the bushland is required to be protected and in some places augmented and restored. In view of the sensitivity of this area and the firebreaks provided by the quarries (Cleary Bros and Readymix) and grazed grassland it is not proposed to undertake hazard reduction activities in the bushland area.

5.16.4.2 Response to Fire Incident

(i) Any fires, such as equipment fires, ignited within the quarry will be controlled in the first instance by trained quarry staff using available fire fighting equipment including fire extinguishers and the water cart. Should the Quarry Manager consider that the fire cannot be readily controlled or in the event of a fire presenting a threat to land outside the working area of the quarry, the Rural Fire Service will be called to assist.

(ii) In the event of a bushfire threatening the quarry from external land the company will assist the Rural Fire Service as far as possible to prevent the fire spreading onto the site.

5.16.5 Fuel Spill

The only fuel within the quarry extension area will be within plant and equipment. Fuel will not be stored in the quarry. Fuel trucks will visit the site as required for refuelling purposes. The following protocols apply to fuel spillages:

(i) Refuelling is to be carried out more than 100 metres from any water storage that could receive spillage;

(ii) In the event of a spillage, appropriate steps are to be taken to contain the spill and prevent fuel reaching the water storage;

(iii) Spilt fuel is to be collected if possible;

(iv) Should fuel reach the water storage, it is to be skimmed from the surface and removed as liquid waste;

(v) Should a significant quantity of loose surface material become contaminated with spilt fuel it is to be collected and removed for disposal to a licensed landfill.

(vi) Should a major pollution incident occur to the external environment, advise DECC as indicated above.

5.16.6 Blasting Mishap

Extensive precautions are in place to prevent any incident occurring during blasting (refer to section 5.7). Should an incident occur where flyrock is believed to have left the quarry area, the owners of any affected neighbouring property will be contacted, notified of the occurrence and asked to report any damage.

5.16.7 Unauthorised Access

The following measures are in place to maintain security of the site:

(i) All personnel entering the site along the quarry access road are required to report to the office;

(ii) Vehicular access to the site is locked at times when the site is unattended;

(iii) Fencing is to be maintained along the property boundary to the north of the quarry and the gate on the access road to *Belmont* will be kept closed when not in use.

(iv) Signs warning of the deep excavation are to be displayed along the extractive area boundary fencing with the adjoining dairy property at 50 metre intervals.

5.16.8 Major Truck Accident

Potential vehicle accidents on the site include collisions and runaway accidents on the steep access road. Should a vehicle be involved in a major accident on the premises, staff will initially attend to the needs of any injured personnel. If there is a spill of fuel, emergency response procedures will be initiated as described above. Should there be a spill of extracted material, steps will be taken to recover the material as far as practicable. The Department of primary Industries will be notified of any accident on the site in accordance with requirements.

Should a runaway vehicle leave the access road and enter the bushland on Lot 23 DP 1039967 Shellharbour Council and DECC shall be notified as soon as possible.

5.16.9 Emergency Procedures

A copy of Cleary Bros existing staff work instruction for emergency procedures at the Albion Park quarry in included as *Appendix H*.

6

COMPLAINTS MANAGEMENT

6.1 OVERVIEW

This complaints management system contains the following elements:

- advertised telephone number, postal address and email address for complaints;
- system for logging and investigating complaints;
- process for recording the outcome of investigations and action taken; and
- feedback to complainants following investigation.

6.2 CONTACT DETAILS

6.2.1 Telephone Hot-line

The 24-hour telephone number for use by the public when making complaints is

0408 322 213.

This number is used to receive complaints specifically for Albion Park quarry. The number will be made known to the public by:

(i) inclusion in future telephone directory listings for Cleary Bros;

(ii) direct advice to councils, DECC and any persons who may contact the company regarding a complaint by mail or using existing phone numbers;

(iii) printing on business cards and fridge magnets for issue to interested persons as the opportunity arises; and

(iv) inclusion on a sign at the property entrance.

The telephone number is answered by Cleary Bros Quarry Manager. If the manager is on leave the phone will be diverted to the acting manager.

6.2.2 Post and Email

Complaints may also be lodged to Cleary Bros by post or email as follows:

Albion Park Quarry Complaints
Cleary Bros (Bombo) Pty Ltd
PO Box 210
PORT KEMBLA NSW 2505

email: environmentalengineering@clearybros.com.au

6.3 COMPLAINTS LOGGING

When a complaint is received by Cleary Bros, details will be recorded on a Customer Feedback Form. These forms are designed to be used to record complaints from purchasers of the company's products as well as members of the community with a complaint about the company's operations. Unused copies of these forms will be kept by the quarry manager and in the site office and divisional office at all times and will be issued to on-call staff. A copy of a Customer Feedback Form is included in *Appendix I*.

Completed forms will be sequentially numbered and filed at the company's divisional office in numerical order. A copy will be retained in the site office and may be inspected by authorised persons from regulatory bodies.

6.4 COMPLAINTS INVESTIGATION

The following procedures will be followed whenever complaints are received:

(i) Every complaint is to be investigated as far as practicable, a response given to the complainant and a record created of the response.

(ii) The procedure for investigating complaints and responding is to be explained to the complainant at the time the complaint is recorded.

(iii) If the complaint is received by staff while an incident is claimed to be occurring, the location of the incident is to be visited, immediately if practicable, to verify and record details.

(iv) If the complaint is received after the incident when the grievance is no longer occurring, or if it is not practical to visit the location, full details are to be obtained from the complainant and recorded.

(v) A record is to be made of the company's activities at the location of the incident during the period leading up to the time of the incident.

(vi) If the matter relates to dust, noise or blasting, the wind strength and direction are to be obtained from the weather station data for the period of about one hour prior to the incident.

(vii) The complainant is to be contacted within two working days of the complaint being lodged to provide details of the investigations and other action taken in response to the complaint.

(viii) The Customer Feedback Form is to be completed to summarise all actions taken to investigate the complaint including:

- time, date and location of incident;
- name and address of complainant (if provided);
- name of the person conducting the investigation;
- activities at the location during the hour preceding the incident;
- average wind strength and direction during hour preceding a noise or dust incident;
- any observations as to the possible cause of the incident;
- summary of information given to complainant in follow up call.

(ix) Anonymous complaints are to be recorded and investigated but in the absence of contact details, a personal response to the complainant will not be possible.

7

ENVIRONMENTAL MONITORING PROGRAM

7.1 MONITORING PARAMETERS

Monitoring will be carried out as required by the development consents and environment protection licence applying to the site (refer to appendices). These documents require monitoring of meteorology, noise, blasting, air quality and water quality.

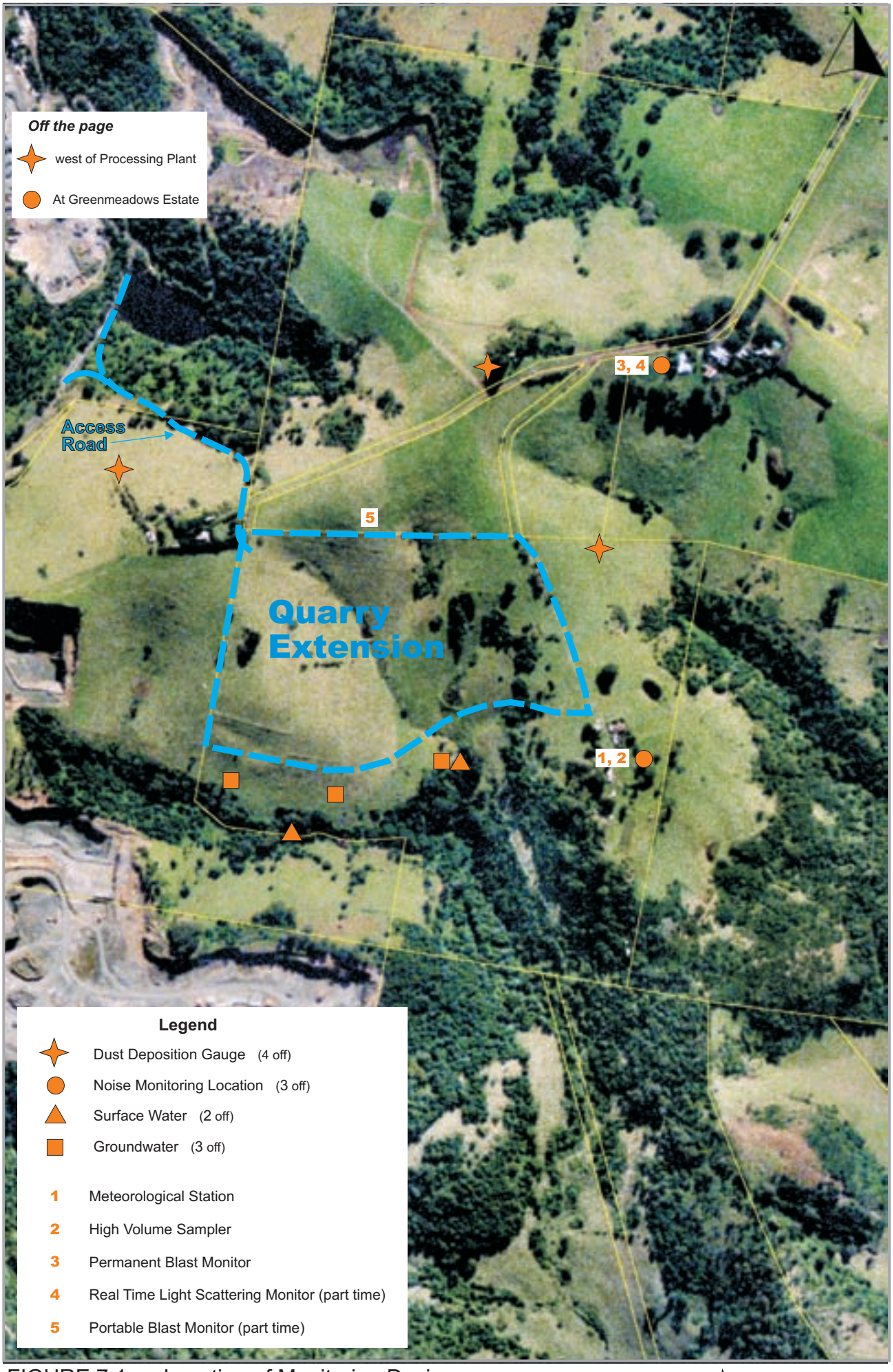
7.2 WEATHER MONITORING

The site weather station was set up in 2005 to monitor temperature, wind and rainfall data as detailed in *Table 7.1*. The data are continuously recorded and averaged over one-hour intervals. The location of the weather station is shown on *Figure 7.1.*

Table 7.1 WEATHER MONITORING PARAMETERS

Parameter	Units
Temperature at 2 metres	K
Temperature at 10 metres	K
Total Solar Radiation at 10 metres	W/m^2
Wind direction at 10 metres	Compass points
Wind speed at 10 metres	m/s
Sigma theta at 10 metres	degrees
Rainfall	mm/hr

Meteorological data may be retained in the form of a digital file but shall be accessible on request from representatives of the Department of Planning or DECC. A summary of meteorological data collected at the site during the year shall appear in the Annual Environmental Management Report (refer to section 8) together with progressive long term averages. Auditors should verify that data collection is ongoing and that the telemeter system works to notify the quarry manager when the wind velocity exceeds 5.4 metres per second for more than 15 minutes.



Base Aerial and Cadastral - LIC and Shellharbour City Council 2003. Aerial Photo date 24/6/2002.

112R1 14.04.2007

FIGURE 7.1 Location of Monitoring Devices

7.3 NOISE MONITORING

7.3.1 Source

Noise monitoring requirements are detailed in the Noise Monitoring Programme/Blast Management Plan (Heggies Australia 2006) and summarised below.

7.3.2 Location

Noise monitoring locations are as follows:

Location Type	Monitoring Location
Reference location	"Belmont" (Cody Residence)
Residential Assessment Location	"The Cottage" (Dunster Residence)
Residential Assessment Location	Greenmeadows Residential Estate

Operator attended monitoring and unattended noise logging shall be carried out at all of the above locations, except as detailed in 7.3.3 below.

7.3.3 Frequency

Operator attended noise monitoring is to be undertaken on one day per calendar quarter for the first 12 months after commencement of works and then at yearly intervals and at the commencement of any significant operational event.

Unattended noise logging is to be carried out for a minimum period of seven days on a quarterly basis for the first 12 months after commencement of works and then at yearly intervals.

The Greenmeadows estate is affected by noise from the processing plant which is unlikely to change unless the plant is altered. Once compliance has been established, further quarterly noise monitoring at this location is not required, although annual monitoring will continue.

7.3.4 Method

Operator attended monitoring shall quantify and characterise the maximum (LA_{max}) and the average ($LA_{eq15min}$) intrusive noise from quarrying over a 15 minute measuring period.

Unattended continuous noise logging shall be conducted to quantify overall ambient noise amenity levels resulting from quarrying and processing emissions and other environmental noise sources.

Measurements will be taken with acoustic instrumentation carrying current NATA or manufacturer calibration certificates. Instrument calibration will be checked before and after each measurement survey.

All noise measurements will be accompanied by qualitative and quantitative measurements of prevailing local weather conditions. The operator shall record any significant quarry generated noise sources and obtain the operating logs for quarry plant and equipment during the measurement period.

7.3.5 Performance Targets

Performance targets are summarised in section 5.5 of this QEMP.

7.3.6 Assessment

Operator attended residential measurements are designed to confirm that noise generated by the development does not exceed the noise limits specified in the development consent (see section 5.5 of this QEMP).

Unattended noise logger data shall be correlated with weather data and quarry operating conditions, with data from periods of unstable weather deleted. The results shall be presented graphically.

7.3.7 Reporting and Review

The results of noise monitoring are to be included in the Annual Environmental Management Report.

In the event of any exceedence of relevant criteria, the matter will immediately be brought to the attention of the Quarry Production Manager, who will report the exceedence as required in section 7.7 of this QEMP.

After every noise monitoring occasion, the Quarry Production Manager and Environmental Officer will examine the results, compare them with previous results and look for any trends. Should declining performance be indicated, the reasons will be explored and appropriate corrective action taken. Follow-up noise monitoring may be undertaken to confirm the validity of any suspect results or to test the effectiveness of corrective action.

7.4 BLAST MONITORING

7.4.1 Source

Blast monitoring requirements are detailed in the Noise Monitoring Programme/Blast Management Plan (Heggies Australia 2006) and summarised below.

7.4.2 Location

A blast monitor for airblast and vibration is located at "The Cottage" on Figtree Hill land, being the closest inhabited residence. This monitor is to be permanently installed and fitted with a remote communications link.

When blasting within 40 metres of the northern boundary of the quarry property, a portable blast monitor will be located at the property boundary at the point closest to the blast.

7.4.3 Frequency

Every blast is to be monitored.

7.4.4 Performance Targets

Performance targets are summarised in section 5.7 of this QEMP.

7.4.5 Reporting and Review

The results of blast monitoring are to be included in the Annual Environmental Management Report.

After every blast, the Quarry Production Manager and Environmental Officer will examine the results, compare them with previous results and look for any trends. Should declining performance be indicated, the reasons will be explored and appropriate corrective action taken.

In addition to confirming that performance targets are being met, blast monitoring will provide data to allow periodic review and revision of the blast emissions site laws for the quarry. To maximise the benefits of the blast monitoring process, the significant design parameters, location co-ordinates, emission levels and meteorological data shall be collated and maintained by the quarry in a blast design record for each blast event. The Blast Management Plan contains a suitable format for this record which should be audited.

7.5 AIR QUALITY MONITORING

7.5.1 Source

Air quality monitoring requirements are detailed in the Dust Management Plan (Heggies Australia 2006) and summarised below.

7.5.2 Location

Five dust monitoring devices have been set up and a sixth will be installed subject to landowner agreement at the following locations:

Monitor Type	**Monitoring Location**
Deposition gauge	Dunsters Lane, south west of *The Cottage*;
Deposition gauge	Readymix property, north west of *Kyawana*;
Deposition gauge (new)	Northern property boundary, east of the gate to *Belmont;*
Deposition gauge	West of the administration area of the existing processing plant;
High Volume Sampler	Ridge top, south of *Belmont*
Real time light scattering monitor (new)	Adjacent to *The Cottage* (subject to owner permission)

The location of dust monitoring devices is shown on *Figure 7.1*.

7.5.3 Frequency

Dust deposition gauges will be changed every 30 days with an allowance of plus or minus two days. PM_{10} is to be assessed on a one-day-in-six cycle using the high volume sampler and will continue for a minimum of one year from the start of quarrying in the extension area.

Real time continuous PM_{10} monitoring using the light scattering monitor is to be conducted as follows:

- Stage 1 of quarry production – six continuous months;
- Stage 5 of quarry production – six continuous months;
- Each other stage of quarry production – three continuous months.

7.5.4 Method

The method to be used for dust deposition sampling and analysis is as defined in Australian Standard AS 3580.10.1-1991 – *Particulates - deposited matter - gravimetric method*. Samples are to be analysed for insoluble solids, ash residue and combustible matter. The monthly results are to be given in grams per square metre and will be averaged over a 12-month period.

High volume air sampling shall be conducted by an independent consultant in accordance with AS 3580.9.6-1990. The high volume air sampler shall be fitted with a PM_{10} size selective inlet.

The real time light scattering device shall monitor PM_{10} in proximity to receptors with information conveyed to the Quarry Production Manager by SMS remote telemetry. This device is to be calibrated monthly by taking it to the high volume sampler for a period of 24 hours. The results from both monitors will be compared to provide a calibration factor for the continuous sampler.

7.5.5 Performance Targets

Performance targets are summarised in section 5.8 of this QEMP. A dust deposition limit of four grams per square metre per month (annual average) applies at the nearest residence. This limit will be initially taken to apply at the deposition gauges. If the company wishes, it may subsequently commission dispersion modelling using on-site wind data to predict the level of dust deposition at the gauges that corresponds to 4 $g/m^2/mth$ at the nearest residence. This would enable the performance target for the gauges to be adjusted accordingly.

An additional performance target applies to the continuous real time monitor. The Quarry Production Manager will receive telemetered notification if the continuous monitor records a one-hour average PM_{10} above 125 $\mu g/m^3$. This is to be correlated with observations from the on-site anemometer to determine if the wind direction is consistent with dust generation from the quarry.

7.5.6 Reporting and Review

The results of air quality monitoring are to be included in the Annual Environmental Management Report.

The Quarry Production Manager and Environmental Officer will examine dust monitoring results to confirm that the performance target is being met. Should the results indicate a trend towards non-compliance on an annual average basis, dust control measures on the site will be enhanced.

In the event that non-compliance with the instantaneous air quality goal occurs, correlated with wind direction, the Quarry Production Manager will investigate and address the likely cause by implementing appropriate dust suppression measures as described in section 5.8. Should repeated non-compliance occur, a review of work practices and dust suppression measures will be instigated in accordance with section 12 of the Dust Management Plan.

7.6 WATER MONITORING

7.6.1 Source

Water monitoring requirements are detailed in the Surface Water and Groundwater Management/Monitoring Plan (Golder Associates 2005) and summarised below.

7.6.2 Location

Water monitoring locations are shown on *Figure 7.1*. Three monitoring wells have been established to the south of the extraction area in the land to be revegetated. Two of the wells contain shallow and deep monitoring points, while the third contains only a deep monitor.

There are two gauging stations in the natural watercourses south of the extraction area. One of these is located in the watercourse currently draining the extraction area (watercourse 1) and the other is in the main watercourse entering the property from the west (watercourse 2). The gauging stations correspond to surface water quality monitoring points.

7.6.3 Method

Groundwater and surface water is sampled and analysed as follows:

	Groundwater	Surface Water
Field measurement	Water level, electrical conductivity, pH and temperature	Electrical conductivity, pH and temperature
Laboratory testing	pH, TDS, TSS, Na, K, Ca, SO_4, Cl, NO_3, NO2, alkalinity, TKN, CO_3/HCO_3, oil and grease, BOD, TOC, ammonia, total phosphorus and dissolved metals.	Fortnightly – pH, EC, turbidity All other – pH, TDS, TSS, Na, K, Ca, alkalinity, SO_4, Cl, CO_3/HCO_3, oil and grease and dissolved metals.

Surface water flow is logged every 15 minutes from transducers in each of the two watercourse monitoring stations. At each location the instrumentation is powered by a 12 volt 10 amp hour battery charged by a 10 watt solar panel.

7.6.4 Frequency

As recommended by Golder Associates, groundwater is being sampled three monthly for the first two years and six monthly thereafter. Groundwater level monitoring began in September 2004 and sampling and analysis in December 2004.

Results for surface water samples are available for the upper section of watercourse 2 since August 2003 (collected by Readymix). Fortnightly sampling with limited analysis commenced within the property in September 2004. Full analysis of three-monthly samples commenced in December 2004.

Flow monitoring in the watercourses commenced in May 2005. One of the transducers was subsequently disturbed by cattle and has since been replaced. Data from the loggers is downloaded periodically and retained at the quarry.

7.6.5 Performance Targets

The initial purpose of water monitoring is to establish over several years the normal range of variability of the parameters being monitored. Subsequently, with the quarry operating any unusual variation may be relevant for investigation. There are no targets for these parameters measured external to the site.

7.6.6 Reporting and Review

The results of water quality monitoring are to be tabulated and included in the Annual Environmental Management Report produced for the site.

7.7 ECOLOGICAL MONITORING

7.7.1 Source

Ecological monitoring requirements have been derived from the Quarry Vegetation Management Plan (see Appendix E) and the 2003 EIS (Perram & Partners).

7.7.2 Restoration/Revegetation Area

The restoration/revegetation area is to be inspected by a qualified ecologist once per year and a report prepared of the progress in returning this area to native vegetation. The report shall comment on:

- success of planted stock in the regeneration area;
- natural seeding and growth of native vegetation in the restoration area;
- weed control;
- absence of spoil or rubbish;
- any damage caused by animals or human interference; and
- recommendations for remedial action, if needed.

The ecologist's report including recommendations shall be included in the Annual Environmental Management Report.

7.7.3 Riparian Bushland

The riparian strip of bushland immediately downhill from the quarry that could potentially be impacted by changes to groundwater or surface water patterns shall be inspected annually by a qualified ecologist. The findings are to be discussed with the Quarry Production Manager and reviewed in light of water management practices during the past year. The ecologist's report shall recommend any changes to surface water release or groundwater injection protocols for the coming year and shall be included in the Annual Environmental Management Report.

7.8 NOTIFICATION OF EXCEEDENCE

7.8.1 Exceedence of any Criterion

Condition 1 of Schedule 5 of the Land and Environment Court consent for the quarry provides as follows:

> *If the results of monitoring required in schedule 4 identify that emissions generated by the development are greater than the criteria in schedule 4, then the Applicant shall notify the Director-General and the affected landowners and/or existing or future tenants (including tenants of quarry owned properties) accordingly, and provide quarterly monitoring results to each of these parties until the results show that the development is complying with the criteria in schedule 4.*

This condition is self-explanatory. Criteria provided in schedule 4 of the consent are for noise, blasting and dust and are reproduced in the relevant parts of section 5 of this QEMP.

7.8.2 Further Requirement for Noise Exceedence

Condition 9 of schedule 4 of the Land and Environment Court consent for the quarry provides as follows:

> *Within 7 days of detecting any exceedance of the noise limits in Table 1, the Applicant shall report the exceedance to the DECC and Director-General and to the owner of the property at which there is an exceedance. This report must include details of the date and time of the exceedance, the operational cause of the exceedance, the response initiated, and the measures proposed to ensure ongoing compliance with the noise limits.*

The above action is required to be undertaken in addition to providing quarterly monitoring results described in section 7.7.1.

8

AUDITING AND REPORTING

8.1 INDEPENDENT AUDIT

Independent environmental audits shall be commissioned every three years with the first to take place prior to February 2008, provided production has commenced before that time.

Environmental audits will be undertaken in accordance with Cleary Bros' environmental management system and be compliant with ISO 19011:2002 – *Guidelines for Quality and/or Environmental Systems Auditing*. The name of the nominated auditor must be submitted to the Department of Planning for approval prior to an audit commencing. Should a different auditor be proposed for any future audit, the new name must be submitted for approval.

The audit is to include the following actions:

- assess the environmental performance of the quarry and its effects on the surrounding environment;
- assess whether the quarry is complying with the relevant standards, performance measures, and statutory requirements;
- review the adequacy of this Quarry Environmental Management Plan (including environmental strategy and monitoring program); and, if necessary,
- recommend measures or actions to improve the environmental performance of the quarry, and/or the environmental management and monitoring systems.

An audit report is to be prepared and submitted to the Director-General within three months of commissioning the audit. The submission is to contain the company's response to recommendations contained in the audit report.

8.2 REPORTING

An Annual Environmental Management Report (AEMR) is to be prepared and submitted to the following agencies:

- Department of Planning (for Director-General);
- Department of Environment and Climate Change;

- Department of Natural Resources (or successor);
- Shellharbour City Council;
- Department of Primary Industries (Mineral Resources)

The initial report is to be submitted within 12 months of the commencement of works authorised by the development consents.

The AEMR is to respond to the following requirements (schedule 6, condition 5):

(i) identify the standards and performance measures that apply to the development;

(ii) describe the works carried out in the last 12 months;

(iii) describe the works that will be carried out in the next 12 months;

(iv) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years;

(v) include a summary of the monitoring results for the development during the past year

(vi) include an analysis of these monitoring results against the relevant;

- impact assessment criteria;
- monitoring results from previous years; and
- predictions in the EIS;

(vii) identify any trends in the monitoring results over the life of the development;

(viii) identify any non-compliance during the previous year; and

(ix) describe what actions were, or are being, taken to ensure compliance.

9

COMMUNITY RELATIONS

9.1 COMMUNITY CONSULTATIVE COMMITTEE

9.1.1 Purpose

The purpose of the community consultative committee (CCC) is to oversee the environmental performance of the quarry. In particular the committee has the following functions:

- review and provide advice on the environmental performance of the quarry;
- review the QEMP, monitoring results, audit reports or complaints;
- review each annual environmental management report submitted to DECC and make submissions to DECC if desired.

9.1.2 Membership

The committee membership is as follows:

- two Cleary Bros representatives, one of whom is the environmental officer;
- one representative of Shellharbour Council;
- two community representatives (at least), one of whom represents the Figtree Hill land; and
- an independent chairman.

The appointment of all members, including any replacement for members who resign, is to be approved by the Director-General. It is the responsibility of Cleary Bros to establish the committee, invite membership including any replacement or additional members and obtain the Director-General's approval for the company's nominees.

9.1.3 Meetings

The CCC meets at least twice per year. Cleary Bros has the following responsibilities with respect to committee meetings:

- provide the venue and secretarial support to produce agendas and minutes;
- arrange site inspections when warranted;

- make minutes available for public inspection within 14 days of a meeting, or as the committee agrees;
- respond to advice or recommendations from the committee regarding environmental performance of the quarry; and
- forward to the Director-General a copy of the minutes and any responses to committee recommendations within one month of the committee accepting the minutes.

9.2 COMMUNITY INFORMATION

The following environmental information regarding the quarry is to be made available to the community:

- this QEMP and each management plan required under the consent which has been produced as a separate document and approved by the Director-General, including:
  - Survey Plan
  - Blast Management Plan/Noise Monitoring Program
  - Dust Management Plan
  - Water Management Plan
  - Vegetation Clearing Protocol
  - Vegetation Management Plan
  - Rehabilitation Management Plans
  - Heritage Management Plan
  - Landscape Plan for visual/noise bunds
- any revision to the above plans;
- reports from independent audits;
- each annual environmental management report;
- a summary of the results of all monitoring required under the consent, updated at least every six months;

The above documents are to be made available within one month of approval, or where approval is not required, within one month of being created. The means of making the material available is as follows:

- provide a copy to the CCC;
- provide a copy to DECC, Shellharbour Council, DNR or RTA, where it is relevant to their responsibilities (Council will receive all documents);
- make a copy available for inspection by the public at Cleary Bros Port Kembla office;
- place a copy on the web site for the quarry.

9.3 INDEPENDENT REVIEW

The Director-General may initiate the independent review process after considering a written request from a landowner, other than a quarry owner. This would occur if the landowner believed that the performance goals specified in the development consent and reproduced in section 5 of this QEMP were being exceeded.

If requested by the Director-General, within three months Cleary Bros is to consult with the landowner, commission an independent review and submit the outcome to the Director-General. The review is to be conducted by an independent expert approved by the Director-General. The expert is to conduct monitoring to determine if the performance criteria are being met and if not, the source of the exceedence. Having regard to the possibility of cumulative impacts from more than one quarry, the expert is also required to ascertain the contribution from Cleary Bros' quarry to the exceedence.

If the criteria are found not to be exceeded the independent review can be discontinued with the approval of the Director-General. If exceedence is confirmed then Cleary Bros is to take all practicable measures to bring the quarry into compliance and conduct further monitoring to confirm that this has been achieved or enter a written agreement with the landowner allowing the exceedence to continue to the satisfaction of the Director-General. If agreement cannot be reached either party may refer the matter to the Director-General for resolution.

Should it be discovered that more than one quarry is responsible for an exceedence, Cleary Bros is required to prepare a cumulative management plan for noise, blasting or dust, as the case may be with the agreement of the landowner and the other quarry. The plan is to be implemented by both quarries. If agreement cannot be reached with the other quarry or the landowner over this approach, then either Cleary Bros or the landowner may refer the matter to the Director-General for resolution.

9.4 DISPUTE RESOLUTION

Should the Director-General be unable to resolve a dispute within 21 days then the Director-General is to refer the matter to an independent dispute resolution process for which an indicative outline appears in Appendix 2 of the quarry consent.

APPENDICES

Appendix A

QUARRY DEVELOPMENT CONSENT

Land and Environment Court
of New South Wales

CITATION :	**Figtree Hill v Cleary Bros and others (No 2) [2006] NSWLEC 63**
PARTIES :	APPLICANT Figtree Hill Pty Limited FIRST RESPONDENT Cleary Bros (Bombo) Pty Limited SECOND RESPONDENT Minister for Infrastructure and Planning
FILE NUMBER(S) :	10639 of 2005
CORAM:	Hussey C; Brown C
KEY ISSUES:	Development Application :- the extension to an existing hard rock quarry - written submissions on conditions
DATES OF HEARING:	Written submissions 27/01/06
DATE OF JUDGMENT :	21/02/2006
LEGAL REPRESENTATIVES:	APPLICANT Ms J Reid, solicitor SOLICITORS Pike, Pike and Fenwick FIRST RESPONDENT Ms A Penklis, solicitor SOLICITORS Sparke Helmore SECOND RESPONDENT No submissions

THE LAND AND ENVIRONMENT COURT OF NEW SOUTH WALES

Hussey C with Brown C

21 February 2006

10639 of 2005 **Figtree Hill Pty Limited (Applicant) v**

Cleary Bros (Bombo) Pty Limited (First Respondent) and

Minister for Infrastructure and Planning (No.2) (Second Respondent)

JUDGMENT

1 **COMMISSIONERS**: The appeal is made pursuant to s 98 of the *Environmental Planning and Assessment Act 1979* (the EPA Act) where an objector who is dissatisfied with the determination of a consent authority to a development application for designated development may appeal to the Court.

2 The appeal relates to the granting of development consent by the then, Minister for Infrastructure and Planning (the Minister) of DA No. 466-11-2003 on 27 May 2005 for the extension to an existing hard rock quarry at Croom, approximately 2.5 kilometres east of Albion Park and 4 kilometres west of Shellharbour (the site).

3 The appeal was heard on 8, 9, and 12 December 2005. On 13 January 2006 the findings on the merits were provided to the parties (*Figtree Hill v Cleary Bros and others* [2006] NSWLEC 9) and required the parties to

amend the conditions based on the findings in the judgement. The Directions (at pars 94 and 95) stated:

> *The conditions of consent require amendment to those provided to the Court based on the findings in the preceding paragraphs and the need for further discussions between the parties. We propose to make directions for the parties to confer and produce amended conditions of consent within 14 days based on the findings in the judgment .i.e., by 27 January 2006. If the amended conditions are not received by this date the Court will make final Orders without further reference to the parties.*
>
> *Leave is also granted for the parties to restore the matter on 48 hours notice if no agreement can be reached on the conditions. Any leave to restore the matter must be within a time to allow final Orders to be made immediately after 27 January 2006.*

4 Notwithstanding the Direction to confer, it appears that little if any discussion has taken place between the parties so we have addressed the areas still in dispute based on the submissions and evidence provided by the parties.

Schedule 2 Definitions

5 We accept the amendment to the definition of "Fig Tree Hill Land" proposed by the Applicant as it is less ambiguous and reflects the findings in the judgement.

Schedule 4 - Condition 2:

6 We accept the amendment proposed by the Applicant as the total requirements for the buffer on the northern boundary are more appropriately contained within the condition rather than as a separate note to the condition.

Schedule 4 - Condition 14(d)(iv)

7 This condition relates to the Blast Management Plan and the Respondents seek to limit the operation of this plan to the "rural use" of land whereas the Applicant submits that the condition should relate to the land in general. We accept the Applicants submission on this condition as it

provides appropriate protection for the future use of the Applicants land. We however, accept the Respondents submission that there should be "general" compliance with the Blast Management Plan as this provides a limited amount of flexibility in its operation.

Schedule 4 - Condition 20

8 This condition relates to management and monitoring of air quality and the Respondents seek to retain the word "generally" when considering the Dust Management Plan. For the reasons mentioned in the preceding paragraph we accept this submission.

Schedule 4 - Conditions 46 and 47

9 These conditions relate to site access and the previous findings specifically required discussion between parties to addresses the conflict. Despite this direction no discussion appears to have taken place. Based on the site view, the evidence and submissions we accept the Applicants submission. In our view Dunsters Lane is inappropriate for traffic associated with the quarry (except in an emergency) because of its construction, alignment and proximity to dwellings on the Fig Tree Hill Land.

Schedule 4 – Condition 52

10 This condition relates to the requirement for dilapidation surveys. While not raised by either party, the condition requires the owners of the Fig Tree Hill Land to supply to the Second Respondent, three nominees to undertake this work within a "reasonable" period of time. Due to the uncertainty associated with this requirement the nominees should be provided to the Second Respondent within three months.

Schedule 4 – Condition 56

11 This condition requires that the trees required by the landscaping plans to be replaced if they die. The condition required these trees to be replaced within a " reasonable" time whereas the Applicant requires this to be more

specific and nominates a period of 28 days. We accept the Applicants submission.

Schedule 5 - Environmental Management, Monitoring, auditing and Reporting Condition 8(e)

12 The inclusion of this condition is consistent with the findings in par 88 of the Courts previous judgement.

13 The Orders of the Court are:

1. The appeal is dismissed.

2. The extension to an existing hard rock quarry at Lot 1 in DP 858245 and Lot 23 in DP 1039967, Dunsters Lane, Croom, is approved subject to the conditions in Annexure A.

3. The exhibits are returned with the exception of Exhibits C, L, 3 and 101.

R R Hussey
Commissioner of the Court

G T Brown
Commissioner of the Court

In the Land and Environment Court of New South Wales

No.10639 of 2005

Figtree Hill Pty Limited

Applicant

Cleary Bros (Bombo) Pty Limited

First Respondent

Minister for Infrastructure and Planning

Second Respondent

Order

The orders of the Court are:

1. The appeal is dismissed.

2. The extension to an existing hard rock quarry at Lot 1 in DP 858245 and Lot 23 in DP 1039967, Dunsters Lane, Croom, is approved subject to the conditions in Annexure A.

3. The exhibits are returned with the exception of Exhibits C, L, 3 and 101.

Ordered: 21 February 2006

By the Court

SEAL OF THE LAND AND ENVIRONMENT COURT NEW SOUTH WALES

Susan Dixon
Registrar

ANNEXURE A

Figtree Hill Pty Limited v Cleary Bros (Bombo) Pty Limited & Minister for Planning

Land and Environment Court Proceedings No. 10639 of 2005

CONDITIONS OF CONSENT

SCHEDULE 1

Application made by:	Cleary Bros (Bombo) Pty Ltd.
To:	Minister for Infrastructure and Planning
Land:	Lot 1 DP 858245 and Lot 23 DP 1039967, Dunsters Lane, Croom.
Proposed Development:	Extension of hard rock quarry
Development Application:	DA 466-11-2003, lodged with the Department of Infrastructure, Planning and Natural Resources on 10 November 2003
State Significant Development:	The proposal is classified as State significant development under section 76A(7) of the *Environmental Planning and Assessment Act 1979*, as it meets the criteria specified in a declaration made by the Minister for Planning on 3 September 1999
Integrated Development:	The proposal is classified as integrated development under section 91 of the *Environmental Planning and Assessment Act 1979*, because it requires additional approvals under the: • *Protection of the Environment Operations Act, 1997;* and • *Rivers and Foreshores Improvement Act, 1948.*
Designated Development:	The proposal is classified as designated development under section 77A of the *Environmental Planning and Assessment Act 1979* because it meets the extractive industry criteria in schedule 3 of the *Environmental Planning and Assessment Regulation 2000.*
Commencement of Consent:	Pursuant to section 83(2) of the *Environmental Planning and Assessment Act 1979*, this consent operates from the date of determination.
Lapse of Consent:	Pursuant to section 95 of the *Environmental Planning and Assessment Act 1979*, this development consent is liable to lapse five years after the date from which it operates unless the use of any land, building or work the subject of the consent is actually commenced before the date on which the consent would otherwise lapse.

SCHEDULE 2
DEFINITIONS

AEMR	Annual Environmental Management Report
Applicant	Cleary Bros (Bombo) Pty Ltd
BCA	Building Code of Australia
Council	Shellharbour City Council
DA	Development Application
DEC	Department of Environment and Conservation
Department	Department of Planning
Design Event	90 percentile, 5 day rain event
Director-General	Director-General of the Department Planning, or delegate
DPI	Department of Primary Industries
Dust	Any solid material that may become suspended in air or deposited
EIS	Environmental Impact Statement
EMS	Environmental Management Strategy
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPL	Environment Protection Licence issued under the *Protection of the Environment Operations Act, 1997*
Fig Tree Hill Land	Lots 4 and 5 in deposited plan 3709 in their present or succeeding titles]
GTA	General Terms of Approval
Heavy vehicle	Any vehicle with a gross vehicle mass of 5 tonnes or more
Land	Land means the whole of a lot in a current plan registered at the Land Titles Office at the date of this development consent
Minister	Minister for Planning, or delegate
POEO Act	*Protection of the Environment Operations Act 1997*
Privately owned land	Land not owned by the Applicant or its related companies or where a private agreement does not exist between the Applicant and the land owner
Regulation	*Environmental Planning and Assessment Regulation 2000*
RTA	The Roads and Traffic Authority
Site	Land to which the DA applies
Stage	The quarry development stages as described in the EIS

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SCHEDULE 3
ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

1. The Applicant shall implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the development.

Scope of Development

2. The Applicant shall carry out the development in accordance with:
   a) DA No. 466–11-2003;
   b) The EIS titled *Proposed Quarry Extension Albion Park*, dated October 2003, and prepared by Perram & Partners; and
   c) Conditions of this consent.

3. If there is any inconsistency between the above, the conditions of this consent shall prevail to the extent of the inconsistency.

4. The Applicant shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
   a) Any reports, plans or correspondence that are submitted in accordance with this consent; and
   b) The implementation of any actions or measures contained in these reports, plans or correspondence.

   Note: Amendment of any environmental management plan, strategy or monitoring program required under this consent shall be prepared and approved in accordance with the consultation and approval requirements of the original environmental management plan, strategy or monitoring program, unless otherwise authorised by the Director-General.

Staged Development

5. Under section 80(4) of the Act, this consent is issued for Stages 1 to 4 of the development only.

6. Under section 80(5) of the Act, Stages 5 and 6 must be the subject of another development consent.

   A consent granted in accordance with condition 6 does not require a further development application under section 78A of the Act. However, in seeking consent for Stages 5 and 6, the Applicant shall submit a report to the Minister that has been prepared in consultation with the CCC, the landowner(s) of 'The Fig Tree Hill Land', and relevant government authorities. The report shall be consistent with the original development application (DA 466-11-2003) and shall include:
   a) details of the proposed quarrying operations for Stages 5 and 6;
   b) results of consultation conducted during preparation of the report;
   c) assessment of the environmental, social, agricultural and economic impacts of Stages 5 and 6, based on the environmental performance of Stages 1 to 4 and consultation referred to in subclause (b) above;
   d) assessment of the consistency of Stages 5 and 6 with relevant environmental planning instruments and strategies; and
   e) justification for the extraction of Stages 5 and 6.

   Notes: Within 4 weeks of receiving this report, the Minister will endeavour to:
   - *make the report public and notify the objectors to the original proposal by letter;*
   - *seek independent expert advice on the report if deemed to be warranted;*
   - *seek advice from relevant government authorities on the report;*
   - *determine the proposal; and*
   - *make this determination public.*

Period of Approval

7. This consent lapses 30 years after the date it commences.

   Note: Conditions of this consent may require activities to be carried out by the Applicant beyond the period of approval for hard rock extraction, processing, and rehabilitation on the project site.

Limits on Production

8. The production of quarry products from the quarry shall not exceed 400,000 tonnes per annum.

9. The Applicant shall:
   a) Provide annual production data to the DPI using the standard form for that purpose; and
   b) Include a copy of this data in the AEMR.

Protection of Public Infrastructure

10. The Applicant shall:
    a) Repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and
    b) Relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development.

Operation of Plant and Equipment

11. The Applicant shall ensure that all plant and equipment at the site, or used in connection with the development, are:
    a) Maintained in a proper and efficient condition; and
    b) Operated in a proper and efficient manner.

Demolition

12. The Applicant shall ensure that all demolition work is carried out in accordance with *AS 2601-2001: The Demolition of Structures*, or its latest version.

Compliance

13. Prior to commencement of operations, the Applicant shall commission an independent person(s) or organisation(s), approved by the Director-General, to certify in writing to the satisfaction of the Director-General, that the Applicant has complied with all conditions of this consent applicable prior to that event.

14. At least two weeks prior to the commencement of any works, the Applicant shall notify the owners of the Fig Tree Hill Land, in writing, of the date of commencement of works authorised by this consent.

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SCHEDULE 4
SPECIFIC ENVIRONMENTAL CONDITIONS

IDENTIFICATION OF BOUNDARIES

1. Prior to the commencement of works, the Applicant shall:
   a) engage a registered surveyor to mark out the boundaries of the approved limits of extraction;
   b) submit a survey plan of these boundaries to the Director-General; and
   c) ensure that these boundaries are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify those limits.

Note: The limit of extraction includes the area described in the EIS, as amended by the 'Quarry Area' shown on the plan in Appendix 1 (southern boundary), and as amended by the conditions below.

BUFFER

2. A minimum buffer of 10 metres must be maintained between the common northern boundary of Lot 1, DP 858245 and the southern boundary of Lot 4, DP 3709. No extraction is permitted within this 10 metre buffer area. The buffer may be used for landscaping, minor drainage works, noise/visual bunds alignment of the haul road (including batters), as depicted on the plan in Appendix 3.

NOISE

Construction of Noise/Visual Bunds

3. The Applicant shall complete construction of the noise/visual bunds prior to commencing extraction of production material, and shall make all reasonable efforts to complete construction of the bunds within 26 weeks of commencement.

Noise Limits

4. [1]The Applicant shall ensure that noise generated by the development does not exceed the criteria specified in Table 1.

Receiver Locations	Noise Limits dB(A) $L_{Aeq\ (15minute)}$		
	Stages 1-2	Stages 3-4	Stages 5-6
'The Hill' residence (Dunster premises)	35	38	35
'The Cottage' residence (Dunster premises)	35	38	35
Approved rural workers dwelling (Dunster premises)	35	38	35
Greenmeadows Residential Estate	41	41	41

Table 1: Noise Criteria for the Development

Notes:

1. *Staging as depicted in Figure 3.5 of the EIS prepared by Perram and Partners, dated October 2003.*
2. *Receiver locations nominated in Table 5.12 of the report prepared by Richard Heggie and Associates Report No. 30-1079R1 titled 'Noise and Blasting Impact Assessment – Cleary Bros Albion Park Quarry' (13 December 2002). At the time of the DA the above were the nearest affected residences.*
3. *The receiver locations and noise limits in the above table may be varied in the instance that negotiated agreements are entered into by the licensee and affected residents/occupiers or if existing agreements become void, or the nearest receiver location changes due to urban encroachment. These limits may be subject to change with an EPL variation.*
4. *Noise from the premises is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of the dwelling where the dwelling is more than 30 metres from the boundary, to determine compliance with the noise level limits in Table 1. Where it can be demonstrated that direct measurement of noise from the premises is impractical, the EPA may accept alternative means of determining compliance. See Chapter 11 of the NSW Industrial Noise Policy. The modification factors presented in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise level where applicable.*
5. *The noise emission limits in Table 1 apply under meteorological conditions of:*
   - *Wind speeds up to 0.5m/s in any direction at 10 metres above ground level; or*
   - *Temperature gradient (environmental lapse rate) conditions of less than or equal to 0°C/100m (lapse).*

[1] Incorporates DEC GTA

Operating Hours

5. [2]The Applicant shall comply with the operating hours in Table 2.

Activity	Days of the Week	Time
Drilling, rock breaking, loading and haulage of material from quarry to processing plant, processing and stockpiling, overburden stripping and other stage preparatory works, all site construction activities, rehabilitation works, general plant and maintenance, Processing, crushing and screening and product transfer to stockpiles	Monday – Friday Saturday	7.00 am – 5.30 pm 7.00 am – 1.00 pm

Table 2: Operating Hours for the Development

6. [3]The following activities may be carried out at the premises outside the hours specified in Table 2:
   a) the delivery of materials as requested by Police or other authorities for safety reasons;
   b) emergency work to avoid the loss of lives, property and/or to prevent environmental harm;
   c) workshop activities and other maintenance work inaudible at the nearest affected receiver.

Noise Monitoring Program

7. Within 3 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Noise Monitoring Program for the development, in consultation with the DEC, and to the satisfaction of the Director-General. The Program shall include:
   a) noise impact assessment criteria and approved hours of operation;
   b) provision for a combination of attended and unattended noise monitoring;
   c) a noise monitoring protocol for evaluating compliance with the noise impact assessment criteria in this consent; and
   d) a protocol for the investigation, notification and mitigation of identified exceedances of the noise impact assessment criteria.

   Note: The program shall be generally in accordance with the draft plan titled 'Albion Park Quarry Extension, Noise Monitoring Programme/Blast Management Plan' dated 10 February 2006 and prepared by Heggies Australia Pty Ltd.

Noise Compliance Assessment Report

8. [4]Within 8 weeks of the date of commencement of extraction of production rock, and annually thereafter, the Applicant shall:
   a) commission a suitably qualified person to assess whether the development is complying with the noise criteria in Table 1 (or as modified), in general accordance with the NSW Industrial Noise Policy and AS 1055-1997: Description and Measurement of Environmental Noise; and
   b) provide the results of this assessment to the DEC and Director-General within 3 months of commissioning the assessment.

Noise Limit Exceedance Report

9. Within 7 days of detecting any exceedance of the noise limits in Table 1, the Applicant shall report the exceedance to the DEC and Director-General and to the owner of the property at which there is an exceedance. This report must include details of the date and time of the exceedance, the operational cause of the exceedance, the response initiated, and the measures proposed to ensure ongoing compliance with the noise limits.

BLASTING AND VIBRATION

Airblast Overpressure Criteria

10. [5]The Applicant shall ensure that the airblast overpressure level from blasting at the development does not exceed the criteria in Table 3 at any point that is located at least 3.5m from any residence or other sensitive receiver on privately owned land.

Airblast overpressure level [dB(Lin Peak)]	Allowable exceedance

[2] Incorporates DEC GTA
[3] Incorporates DEC GTA
[4] Incorporates DEC GTA
[5] Incorporates DEC GTA

115	5% of the total number of blasts over any 12 month reporting period
120	0%

Table 3: Airblast Overpressure Limits

Ground Vibration Criteria

11. [6]The Applicant shall ensure that the peak particle velocity from blasting at the development does not exceed the criteria in Table 4 at any point that is located at least 3.5m from any residence or other sensitive receiver on privately-owned land.

Peak particle velocity (mm/s)	Allowable exceedance
5	5% of the total number of blasts over any 12 month reporting period
10	0%

Table 4: Ground Vibration Limits

Blasting Restrictions

12. [7]Blasting operations on the premises may only take place:
    a) between 9.00am and 5.00pm Monday to Friday inclusive;
    b) are limited to 1 blast each day; and
    c) at such other times as may be approved by the DEC (EPA).

Public Notice

13. During the life of the development, the Applicant shall:
    a) operate a blasting hotline, to enable the public to get up-to-date information on blasting operations at the development. The hotline shall be manned during operational hours with an answering service outside of operational hours, unless otherwise approved by the Director-General; and
    b) notify landowners within 2 kilometres of the site about this hotline on an annual basis, using methods agreed to by the Director-General. Notification shall include, as a minimum:
        (i) signage at the entrance to the site;
        (ii) written notification on an annual basis; and
        (iii) publication on the Applicant's website.

Blast Management Plan

14. [8]Prior to the commencement of operations in each stage of the development after Stage 1, the Applicant shall prepare, and subsequently implement, a Blast Management Plan for the development in consultation with the landowner(s) of The Fig Tree Hill Land and to the satisfaction of the Director-General and DEC. This plan must:
    a) Include a summary of monitoring results for the previous quarry stage;
    b) Describe the objectives for noise and blasting for that stage;
    c) Describe the proposed blasting design for that stage, and demonstrate that the design will meet the blast criteria listed in Tables 3 and 4; and
    d) Describe the measures that would be implemented to:
        (i) meet the blast criteria referred to in this consent, and additional blast criteria at the boundary of the site;
        (ii) avoid and/or minimise any blasting impacts, including flyrock, of the development on The Fig Tree Hill Land, or the continued rural use of that land,;
        (iii) monitor the blasting impacts of the development on The Fig Tree Hill Land; and
        (iv) mitigate, remediate or compensate for any blasting impacts of the development on the residences on The Fig Tree Hill Land' or the use of that land.

Note: The plan shall be generally in accordance with the draft Blast Management Plan titled 'Albion Park Quarry Extension, Noise Monitoring Program/Blast Management Plan' dated 10 February 2006 and prepared by Heggies Australia Pty Ltd.

[6] Incorporates DEC GTA
[7] Incorporates DEC GTA
[8] Incorporates DEC GTA

Blast Monitoring

15. [9]To determine compliance with the blast criteria listed in Tables 3 and 4, the Applicant shall prepare, and subsequently implement, a Blast Monitoring Program for the development to the satisfaction of DEC and the Director-General. This program must address:
    a) monitoring the airblast overpressure and ground vibration levels for all production blasts carried out on the site;
    b) the undertaking of monitoring in accordance with *AS 2187.2:1993*, or as updated; and
    c) maintenance of a written record which includes:
        (i) the time and date of each blast;
        (ii) the station(s) at which the blast was measured;
        (iii) the ground vibration for each blast;
        (iv) the airblast overpressure for each blast;
        (v) evidence that during the past 12 month period, a calibration check had been carried out on each blast monitor to ensure accuracy of the reported data; and
        (vi) the waveform for the ground vibration and overpressure for each blast that exceeds a ground vibration of 5mm/s (peak particle velocity) or an air blast overpressure of 115dB(L).

AIR QUALITY

Air Quality Criteria

16. The Applicant shall ensure that the air pollution generated by the development does not cause exceedances of the ambient air quality standards and goals listed in Tables 5, 6, and 7 at any sensitive receiver or residence on privately-owned land.

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	30 µg/m^3

Table 5: Long Term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging period	Criterion
Particulate matter < 10 µm (PM_{10})	24 hour	50 µg/m^3

Table 6: Short Term Impact Assessment Criterion for Particulate Matter

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m^2/month	4 g/m^2/month

Table 7: Long Term Impact Assessment Criteria for Deposited Dust

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 2003, AS 3580.10.1-1991: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.

Management and Monitoring

17. [10] The site must be maintained in a condition that minimises or prevents the emission of dust from the site, including the prompt and effective rehabilitation of all disturbed areas.

18. Internal unsealed roadways, quarry floor and stockpiles are to be watered as required to minimise dust generation impacting on the natural or built environment.

19. [11]The Applicant shall monitor (by sampling and obtaining results by analysis) the concentration of each pollutant in Table 8 to the satisfaction of the DEC and the Director-General, using the specified unit of measure, averaging period, frequency, sampling method and minimum number of locations.

[9] Incorporates DEC GTA
[10] Incorporates DEC GTA
[11] Incorporates DEC GTA

Pollutant	Unit of Measure	Averaging Period	Frequency	Sampling Method	Locations
Dust deposition	g/m2/month	Month, annual	Continuous	AM-15	4
PM_{10}	$\mu g/m^3$	24 hour, annual	Every 6 days	AM-18	1

Table 8: Sampling of Air Pollutants

20. Within 3 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Dust Management Plan for the development, in consultation with the DEC, and to the satisfaction of the Director-General. The plan shall include:
    a) baseline data on existing air quality in the locality;
    b) air quality impact assessment criteria;
    c) details of the measures that would be undertaken to minimise dust emissions associated with the development;
    d) an air quality monitoring program; and
    e) a protocol for the investigation, notification and mitigation of identified exceedances of the air quality impact assessment criteria.

Note: The plan shall be generally in accordance with the draft Dust Management Plan titled 'Albion Park Quarry Extension Dust Management Plan', dated 22 November 2005 and prepared by Heggies Australia Pty Limited.

METEOROLOGICAL MONITORING

21. The Applicant shall establish a permanent meteorological station at a location approved by the DEC, and to the satisfaction of the Director-General, to monitor the parameters specified in Table 9, using the specified units of measure, averaging period, frequency and sampling method.

Parameter	Units of measure	Averaging period	Frequency	Sampling method
Rainfall	mm/hr	1 hr	Continuous	AM-4
Temperature @ 2 m	K	1 hr	Continuous	AM-4
Temperature @ 10 m	K	1 hr	Continuous	AM-4
Wind direction @ 10 m	Compass points	1 hr	Continuous	AM-2
Wind speed @ 10 m	m/s	1 hr	Continuous	AM-2
Sigma Theta @ 10m	°	1hr	Continuous	AM-2
Total Solar Radiation @ 10m	W/m2	1hr	Continuous	AM-4
Siting	-	-	-	AM-1

Table 9: Meteorological Monitoring

[1] *NSW EPA, 2001, Approved Methods for the Sampling and Analysis of Air Pollutants in NSW.*

SURFACE & GROUND WATER

Note: The Applicant is required to obtain licences and permits for the development under the Protection of the Environment Operations Act 1997, Water Management Act 2000, and the Rivers & Foreshores Improvement Act 1948.

Pollution of Waters

22. [12]Except as may be expressly provided by a Environment Protection Licence, the Applicant shall comply with section 120 of the *Protection of the Environment Operations Act 1997* during the carrying out of the development.

Water Discharge Limit

23. Except as may be expressly provided by an Environmental Protection Licence, the Applicant shall ensure that the discharges from any licensed discharge point/s comply with the limit in Table 10:

[12] Incorporates DEC GTA

Pollutant	Units of Measure	Maximum Limit
TSS	mg/L	50
pH	pH	6.5 - 8.5

Table 10: Water Discharge Pollution Limits

Storm Water Management System

24. [13]The Applicant shall ensure that the stormwater management system for the development is designed, constructed and operated to capture and treat polluted waters from storm event(s) of less than, and including a 1:10 year, 24 hour duration, average recurrence interval (that is 225 mm of total rainfall within the 24 hour period).

25. [14]Within 5 days of a rainfall event, the Applicant shall ensure that the basins in the storm water management system are treated and emptied to maintain the required storage volume.

Flocculant Management

26. [15]The Applicant shall not use a flocculant, other than gypsum, without the written approval of the DEC.

Monitoring and Management

27. Within 12 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Water Management Plan for the development, in consultation with the DEC and DIPNR (Natural Resources) and to the satisfaction of the Director-General. This plan must be prepared by a qualified hydrogeologist and include:
    a) a Water Balance;
    b) an Erosion and Sediment Control Plan;
    c) a Surface Water Monitoring Program;
    d) a Ground Water Monitoring Program; and
    e) an Integrated Water Management Strategy, if the water balance shows a potential demand for water above that which can be collected from rainfall.

28. [16] The Water Balance shall include:
    a) consideration of the existing quarry and processing site, existing water storage dam and the proposed quarry and haul road;
    b) the source of all water collected or stored on the site, including rainfall, stormwater and groundwater;
    c) the estimated water use demand in wet, average and drought years.

29. [17]The Erosion and Sediment Control Plan shall:
    a) be consistent with the requirements of the Department of Housing's Managing Urban Stormwater: Soils and Construction manual;
    b) identify activities that could cause soil erosion and generate sediment;
    c) describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters
    d) describe the location, function, and capacity of erosion and sediment control structures; and
    e) describe what measures would be implemented to maintain the structures over time.

30. The Surface Water Monitoring Program shall include:
    a) detailed baseline data on surface water flows and quality;
    b) surface water impact assessment criteria;
    c) a program to monitor surface water flows and quality;
    d) a program to manage water releases from the site;
    e) a program to monitor bank and bed stability;
    f) a protocol for the investigation, notification and mitigation of identified exceedances of the surface water impact assessment criteria; and
    g) a program to monitor the effectiveness of the Erosion and Sediment Control Plan.

[13] Incorporates DEC GTA
[14] Incorporates DEC GTA
[15] Incorporates DEC GTA
[16] Incorporates DEC GTA
[17] Incorporates DIPNR GTA

31. The Ground Water Monitoring Program shall include:
    a) detailed baseline data on ground water levels and quality, based on statistical analysis;
    b) ground water impact assessment criteria;
    c) a program to monitor regional ground water levels and quality;
    d) a program to monitor ground water level effects on vegetation, and on ground water supply to adjoining properties; and
    e) a protocol for the investigation, notification and mitigation of identified exceedances of the groundwater impact assessment criteria.

32. [18]The Integrated Water Management Strategy shall include:
    a) exploration of a range of options for a sustainable resource alternative for water supply to the site;
    b) identification of all possible and available sources of water;
    c) consistency with Government Water Reform Initiatives and policies;
    d) quality of water to meet usage requirements including any possible effects on product;
    e) costs of supply;
    f) health and environmental impacts;
    g) legislative requirements;
    h) assessment of the feasibility, benefits and costs of options;
    i) a process to identify and evaluate preferred options for implementation; and
    j) the identification of a timetable for implementation of the selected options.

Reporting

33. Each year, the Applicant shall:
    a) review the Water Management Plan;
    b) update each sub-plan; and
    c) report the results of this review in the AEMR, including:
    d) the results of monitoring;
    e) details of the review for each sub-plan;
    f) amendments to the sub-plans; and
    g) details of the measures undertaken/proposed to address any identified issues.

FLORA & FAUNA

Vegetation Clearing Protocol

34. Prior to the commencement of works, the Applicant shall prepare a Vegetation Clearing Protocol for the development in consultation with Shellharbour City Council and the DEC (NPWS), and to the satisfaction of the Director-General. This plan shall:
    a) delineate the areas of remnant vegetation to be cleared; and
    b) describe the procedures that would be implemented for:
        - pre-clearance surveys;
        - progressive clearing;
        - fauna management;
        - conserving and reusing topsoil;
        - collecting seed from the site;
        - salvaging and reusing material from the site; and
        - controlling weeds.

Southern Remnant Vegetation and Revegetation Area

35. The Applicant shall conserve and maintain the southern areas of remnant vegetation marked on the map in Appendix 1.

36. The Applicant shall revegetate/rehabilitate and maintain the areas marked 'Area to be Planted' and 'Weed Control to Promote Natural Vegetation' on the map in Appendix 1. Revegetation shall be in accordance with the Vegetation Management Plan described in Condition 37.

    Note: Other revegetation areas shall be covered in the Vegetation Management Plan referred to in Condition 37 below.

Vegetation Management Plan

37. Within 6 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Vegetation Management Plan for the development in consultation with Shellharbour City Council and the DEC (NPWS), and to the satisfaction of the Director-

[18] Incorporates DEC GTA

General. The plan shall be prepared by a suitably qualified ecologist / bush regenerator, and shall address:

a) establishment of baseline data for existing vegetation and habitat in the area;
b) vegetation management on all areas of the site outside the working area of the quarry;
c) conservation, maintenance and enhancement of threatened communities, including 'Illawarra Subtropical Rainforest' and 'Illawarra Lowlands Grassy Woodlands';
d) conservation, maintenance and enhancement of threatened plant species, including *Cynanchum elegans* (White Cynachum), *Daphnandra sp.aff micrantha* (Illawarra Socketwood), and *Zieria granulata* (Illawarra Zieria);
e) establishment and maintenance of vegetation/habitat for threatened fauna species, including the Grey-headed flying fox;
f) ongoing weed control and maintenance;
g) a program for how the performance of the measures described in (b) to (f) above would be monitored over time;
h) a program for monitoring the effect of quarrying, including water management, on vegetation communities.

Reporting

38. The Applicant shall include a progress report on the implementation of the Vegetation Management Plan in the AEMR.

REHABILITATION

Rehabilitation

39. The Applicant shall progressively rehabilitate the site to the satisfaction of the Director-General.

Rehabilitation Management Plan

40. Within 6 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Rehabilitation Management Plan for the site in consultation with Shellharbour City Council and the DEC (NPWS), and to the satisfaction of the Director-General: This plan must:
    a) identify the disturbed area at the site;
    b) describe in general the short, medium, and long-term measures that would be implemented to rehabilitate the site;
    c) describe in detail the measures that would be implemented over the next 5 years to rehabilitate the site; and
    d) describe how the performance of these measures would be monitored over time.

41. Within 5 years of providing the Rehabilitation Management Plan to the Director-General, and every 5 years thereafter, the Applicant shall review and update the plan to the satisfaction of the Director-General.

Rehabilitation Bond

42. Within 6 months of the date of this consent, the Applicant shall lodge a suitable rehabilitation and conservation bond for the development with the Director-General. The sum of the bond shall be calculated at:
    a) $\$2.50/m^2$ for the total area of disturbance at the development; and
    b) $\$3.00/m^2$ for the total area of the revegetation area,
    to the satisfaction of the Director-General.

    Notes:
    - *If the rehabilitation and revegetation area is completed to the satisfaction of the Director-General, the Director-General will release the rehabilitation and conservation bond.*
    - *If the rehabilitation and revegetation area is not completed to the satisfaction of the Director-General, the Director-General will call in all or part of the rehabilitation and conservation bond, and arrange for the satisfactory completion of these works.*

43. Within 3 years of lodging the rehabilitation and conservation bond with the Director-General, and every 3 years thereafter, unless the Director-General directs otherwise, the Applicant shall review, and if necessary revise, the sum of the rehabilitation bond to the satisfaction of the Director-General. The review must consider:
    a) the effects of inflation;
    b) any changes to the total area of disturbance; and
    c) the performance of the revegetation area.

Reporting

44. The Applicant shall include a progress report on the Rehabilitation Management Plan in the AEMR.

THE SEAL OF THE LAND AND ENVIRONMENT COURT NEW SOUTH WALES

TRAFFIC AND TRANSPORT

Right of Way

45. Prior to the commencement of works, the Applicant shall formalise the Right of Way for the haulage road, to the satisfaction of the Director-General.

Site Access

46. All access to the site is to be via the roundabout at East-West Link Road, except in an emergency, as agreed by the Director General in consultation with the Council.

47. Deleted

Parking

48. The Applicant shall provide sufficient parking on-site for all quarry-related traffic to the satisfaction of the Director-General.

Road Haulage

49. The Applicant shall ensure that all loaded vehicles entering or leaving the site are covered.

50. The Applicant shall ensure all loaded vehicles leaving the site are cleaned of materials that may fall on the road before they are allowed to leave the site.

HERITAGE

51. Within 3 months of the date of this consent, and prior to the disturbance of any relic, the Applicant shall prepare and subsequently implement a Heritage Management Plan for the development, in consultation with NSW Heritage Office and Shellharbour City Council, and to the satisfaction of the Director-General. The plan shall be prepared by a suitably qualified heritage consultant and must include:

a) a program for baseline dilapidation surveys of residences on The Fig Tree Hill Land and the 'Belmont' property (with the consent of the landowners). Surveys shall be undertaken at least prior to the commencement of each quarrying stage;

b) archival recording of 'Kyawana' and 'Belmont' properties, the dry stone walls and other heritage elements affected by the development;

c) a plan for the salvage and on-site reconstruction of the dry stone walls affected by the proposal, in accordance with a conservation and interpretation strategy;

d) a plan for the conservation and maintenance of the dry stone wall on the eastern boundary of the allotment;

e) a plan for providing Council the opportunity to salvage any relic proposed to be destroyed by the development, including 'Kyawana';

f) a procedure for obtaining permits under the Heritage Act prior to disturbance of any relic, and permits under the National Parks and Wildlife Act prior to disturbance of any Aboriginal objects or archaeological remains.

52. The dilapidation surveys required under Condition 51 shall be conducted by a suitably qualified, experienced and independent engineer, whose appointment has been approved by the Director-General. The owners of the Fig Tree Hill land are to supply the applicant with three suggested nominees within 3 months from the grant of this consent. The applicant will submit one engineer from that list to be put forward by the applicant for approval by the Director General.

Reporting

53. The Applicant shall include a progress report on the Heritage Management Plan in the AEM

VISUAL IMPACT

Visual Amenity

54. The Applicant shall minimise the visual impacts of the development to the satisfaction of the Director-General.

55. The visual/noise bunds and screen plantings shall be designed and established in accordance with a Landscape Plan prepared in consultation with Shellharbour City Council, and to the satisfaction of the Director-General. The Landscape Plan shall be prepared by a suitably qualified landscape architect with heritage experience, and shall have regard to the cultural landscape of Wentworth Hills. The plantings shall be commenced prior to the commencement of extraction and completed within six months of the date of this consent.

56. The Applicant shall ensure that the trees in the bund are maintained, and that in the event that trees die that they are replaced within 28 days to the satisfaction of the Director- General.

57. Following construction of the visual/noise bunds, the Applicant shall undertake an independent review of their effectiveness, and undertake any improvements to the satisfaction of the Director-General.

WASTE MANAGEMENT

Waste Minimisation

58. The Applicant shall minimise the amount of waste generated by the development to the satisfaction of the Director-General.

Waste Classification

59. [19]All liquid and non liquid wastes resulting from activities and processes at the site must be assessed, classified and managed in accordance with the EPA's Environmental Guidelines: *Assessment, Classification and Management of Liquid and Non-liquid Wastes (1999)*, or any other EPA document superseding this guideline.

Reporting

60. The Applicant shall describe what measures have been implemented to minimise the amount of waste generated by the development in the AEMR.

EMERGENCY AND HAZARDS MANAGEMENT

Dangerous Goods

61. The Applicant shall ensure that the storage, handling, and transport of dangerous goods is done in accordance with the relevant Australian Standards, particularly AS1940 and AS1596, and the Dangerous Goods Code.

Safety

62. The Applicant shall secure the development to ensure public safety to the satisfaction of the Director-General.

Emergency Management

63. Within 6 months of the date of this consent, the Applicant shall document, and subsequently implement, measures to minimise the environmental impacts of any emergency situations that could arise as a result of the operation of the quarry to the satisfaction of the DEC and the Director-General. This documentation must:
    a) identify any significant threats to the environment and/or public health that could arise from activities associated with the operation of the quarry or construction works associated with the production increase. These threats may include excessive rainfall, pump failures, excess flocculation, power or other utility failure, natural disaster, landslip, accidental spills and discharges, spillage from trucks, fire etc;
    b) identify any subsequent direct or indirect environmental effects as a result of the threats;
    c) identify the pollution that would result due to these threats and impacts on operations and what impact the pollution would have on the health of the community and the environment;
    d) develop actions to effectively respond to the disruption of operations so the risk of pollution is minimised;
    e) develop a communications strategy for alerting relevant agencies and the potentially affected community in the event of the disruption to operations leading to significant pollution;
    f) ensure that all relevant employees are familiar with the documentation; and

[19]. Incorporates DEC GTA

g) when developing this documentation, identify any opportunities to integrate with Cleary Bros Emergency plans.

BUSHFIRE MANAGEMENT

64. The Applicant shall:
    a) ensure that the development is suitably equipped to respond to any fires on-site;
    b) assist the Rural Fire Service and emergency services as much as possible if there is a fire on-site.

65. Within 6 months of the date of this consent, the Applicant shall prepare a Bushfire Management Plan for the development, to the satisfaction of Council and the Rural Fire Service. The plan must have regard to the management of fire regimes and hazard reduction activities so as to avoid negative impacts to threatened species and habitat, endangered communities and populations as well as any cultural assets that may be present.

SCHEDULE 5
ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS

1. If the results of monitoring required in schedule 4 identify that emissions generated by the development are greater than the criteria in schedule 4, then the Applicant shall notify the Director-General and the affected landowners and/or existing or future tenants (including tenants of quarry owned properties) accordingly, and provide quarterly monitoring results to each of these parties until the results show that the development is complying with the criteria in schedule 4.

INDEPENDENT REVIEW

2. If a landowner (excluding quarry owned properties) considers that the operations of the quarry are exceeding the criteria in schedule 4, then he/she may ask the Director-General in writing for an independent review of the impacts of the development on his/her land.

   If the Director-General is satisfied that an independent review is warranted, the Applicant shall within 3 months of the Director-General advising that an independent review is warranted:
   a) consult with the landowner to determine his/her concerns;
   b) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to conduct monitoring on the land, to determine whether the development is complying with the relevant criteria in schedule 4, and identify the source(s) and scale of any impact on the land, and the development's contribution to this impact; and
   c) give the Director-General and landowner a copy of the independent review.

3. If the independent review determines that the quarrying operations are complying with the relevant criteria in schedule 4, then the Applicant may discontinue the independent review with the approval of the Director-General.

4. If the independent review determines that the quarrying operations are not complying with the relevant criteria in schedule 4, then the Applicant shall:
   a) take all practicable measures, in consultation with the landowner, to ensure that the development complies with the relevant criteria; and
   b) conduct further monitoring to determine whether these measures ensure compliance; or
   c) secure a written agreement with the landowner to allow exceedances of the relevant criteria in schedule 4,

   to the satisfaction of the Director-General.

   If the additional monitoring referred to above subsequently determines that the quarrying operations are complying with the relevant criteria in schedule 4, then the Applicant may discontinue the independent review with the approval of the Director-General.

   If the Applicant is unable to finalise an agreement with the landowner, then the Applicant or landowner may refer the matter to the Director-General for resolution.

   If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 2).

5. If the independent review determines that the quarrying operations are not complying with the relevant criteria in schedule 4, but that several quarries are responsible for this non-compliance, then the Applicant shall, with the agreement of the landowner and other quarry(s), prepare and implement a Cumulative Noise, Blasting and/or Air Quality Impact Management Plan to the satisfaction of the Director-General. This plan must provide details of the joint approach to be adopted by the Applicant and other quarry(s) to manage cumulative air quality and/or noise impacts at the landowner's dwelling.

   If the Applicant is unable to finalise an agreement with the landowner and/or other quarry(s), and/or prepare a Cumulative Noise, Blasting and/or Air Quality Impact Management Plan, then the Applicant or landowner may refer the matter to the Director-General for resolution.

   If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 2).

6. If the landowner disputes the results of the independent review, either the Applicant or the landowner may refer the matter to the Director-General for resolution.

   If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 2).

SCHEDULE 6
ENVIRONMENTAL MANAGEMENT, MONITORING, AUDITING AND REPORTING

ENVIRONMENTAL MANAGEMENT STRATEGY

1. Within 6 months of the date of this consent, the Applicant shall prepare, and subsequently implement, an Environmental Management Strategy for the development to the satisfaction of the Director-General. This strategy must:
   (a) provide the strategic context for environmental management of the development;
   (b) identify the statutory requirements that apply to the development;
   (c) describe in general how the environmental performance of the development would be monitored and managed during the development;
   (d) describe the procedures that would be implemented to:
      - keep the local community and relevant agencies informed about the operation and environmental performance of the development;
      - receive, handle, respond to, and record complaints;
      - resolve any disputes that may arise during the course of the development;
      - respond to any non-compliance;
      - manage cumulative impacts; and
      - respond to emergencies; and
   (e) describe the role, responsibility, authority, and accountability of all the key personnel involved in environmental management of the development.

2. Within 14 days of receiving the Director-General's approval for the strategy, the Applicant shall:
   (a) send copies of the approved strategy to the relevant agencies and Council; and
   (b) ensure the approved strategy is made publicly available during the development.

ENVIRONMENTAL MONITORING PROGRAM

3. Within 6 months of the date of this consent, the Applicant shall prepare an Environmental Monitoring Program for the development, in consultation with the relevant agencies, and to the satisfaction of the Director-General. This program must consolidate the various monitoring requirements in schedule 4 of this consent into a single document.

4. Within 3 months of the completion of each Independent Environmental Audit, the Applicant shall review, and if necessary update, the Environmental Monitoring Program to the satisfaction of the Director-General.

ANNUAL REPORTING

5. The Applicant shall prepare and submit an Annual Environmental Management Report (AEMR) to the Director-General and the relevant agencies. This report must:
   (a) identify the standards and performance measures that apply to the development;
   (b) describe the works carried out in the last 12 months;
   (c) describe the works that will be carried out in the next 12 months;
   (d) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years;
   (e) include a summary of the monitoring results for the development during the past year;
   (f) include an analysis of these monitoring results against the relevant:
      - impact assessment criteria;
      - monitoring results from previous years; and
      - predictions in the EIS;
   (g) identify any trends in the monitoring results over the life of the development;
   (h) identify any non-compliance during the previous year; and
   (i) describe what actions were, or are being, taken to ensure compliance.

INDEPENDENT ENVIRONMENTAL AUDIT

6. Within 2 years of the date of this consent, and every 3 years thereafter, unless the Director-General directs otherwise, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:
   (a) be conducted by a suitably qualified, experienced, and independent person whose appointment has been endorsed by the Director-General;
   (b) be consistent with *ISO 19011:2002 - Guidelines for Quality and/or Environmental Systems Auditing*, or updated versions of this guideline;
   (c) assess the environmental performance of the development, and its effects on the surrounding environment;

(d) assess whether the development is complying with the relevant standards, performance measures, and statutory requirements;
(e) review the adequacy of the Applicant's Environmental Management Strategy and Environmental Monitoring Program; and, if necessary,
(f) recommend measures or actions to improve the environmental performance of the development, and/or the environmental management and monitoring systems.

7. Within 3 months of commissioning this audit, or as otherwise agreed by the Director-General, the Applicant shall submit a copy of the audit report to the Director-General, with a response to the recommendations contained in the audit report.

COMMUNITY CONSULTATIVE COMMITTEE

8. Within six (6) months of the date this consent, the Applicant shall establish a Community Consultative Committee to oversee the environmental performance of the development. This committee shall:
   (a) be comprised of:
      - 2 representatives from the Applicant, including the person responsible for environmental management at the mine;
      - 1 representative from Council (if available); and
      - at least 2 representatives from the local community, including one representative for the Fig Tree Hill Land (if available),

      whose appointment has been approved by the Director-General in consultation with the Council;
   (b) be chaired by an independent chairperson, whose appointment has been endorsed by the Director-General;
   (c) meet at least twice a year, with the first meeting to be held within six months of the date of this consent; and
   (d) review and provide advice on the environmental performance of the development, including any construction or environmental management plans, monitoring results, audit reports, or complaints.
   (e) review any document submitted to the DEC in satisfaction of condition 5 of schedule 6 and provide submissions to the DEC.

9. The Applicant shall, at its own expense:
   (a) ensure that 2 of its representatives attend the Committee's meetings;
   (b) provide the Committee with regular information on the environmental performance and management of the development;
   (c) provide meeting facilities for the Committee;
   (d) arrange site inspections for the Committee, if necessary;
   (e) take minutes of the Committee's meetings;
   (f) make these minutes available to the public for inspection within 14 days of the Committee meeting, or as agreed to by the Committee;
   (g) respond to any advice or recommendations the Committee may have in relation to the environmental management or performance of the development;
   (h) forward a copy of the minutes of each Committee meeting, and any responses to the Committee's recommendations to the Director-General within a month of acceptance of the minutes by the Committee.

Note: The Applicant may implement the reporting and consultation requirements under Schedule 5 of this consent in an integrated manner with similar and corresponding requirements under the consent to DA-467-11-2003, to the satisfaction of the Director-General.

ACCESS TO INFORMATION

10. Within 1 month of the approval of any management plan/strategy or monitoring program required under this consent (or any subsequent revision of these management plans/strategies or monitoring programs), the completion of the independent audits required under this consent, or the completion of the AEMR, the Applicant shall:
    a) provide a copy of the relevant document/s to the relevant agencies and the CCC;
    b) ensure that a copy of the relevant documents is made publicly available at the Applicant's regional office; and
    c) put a copy of the relevant document/s on the Applicant's website (once established),

    to the satisfaction of the Director-General.

THE SEAL OF THE LAND AND ENVIRONMENT COURT NEW SOUTH WALES

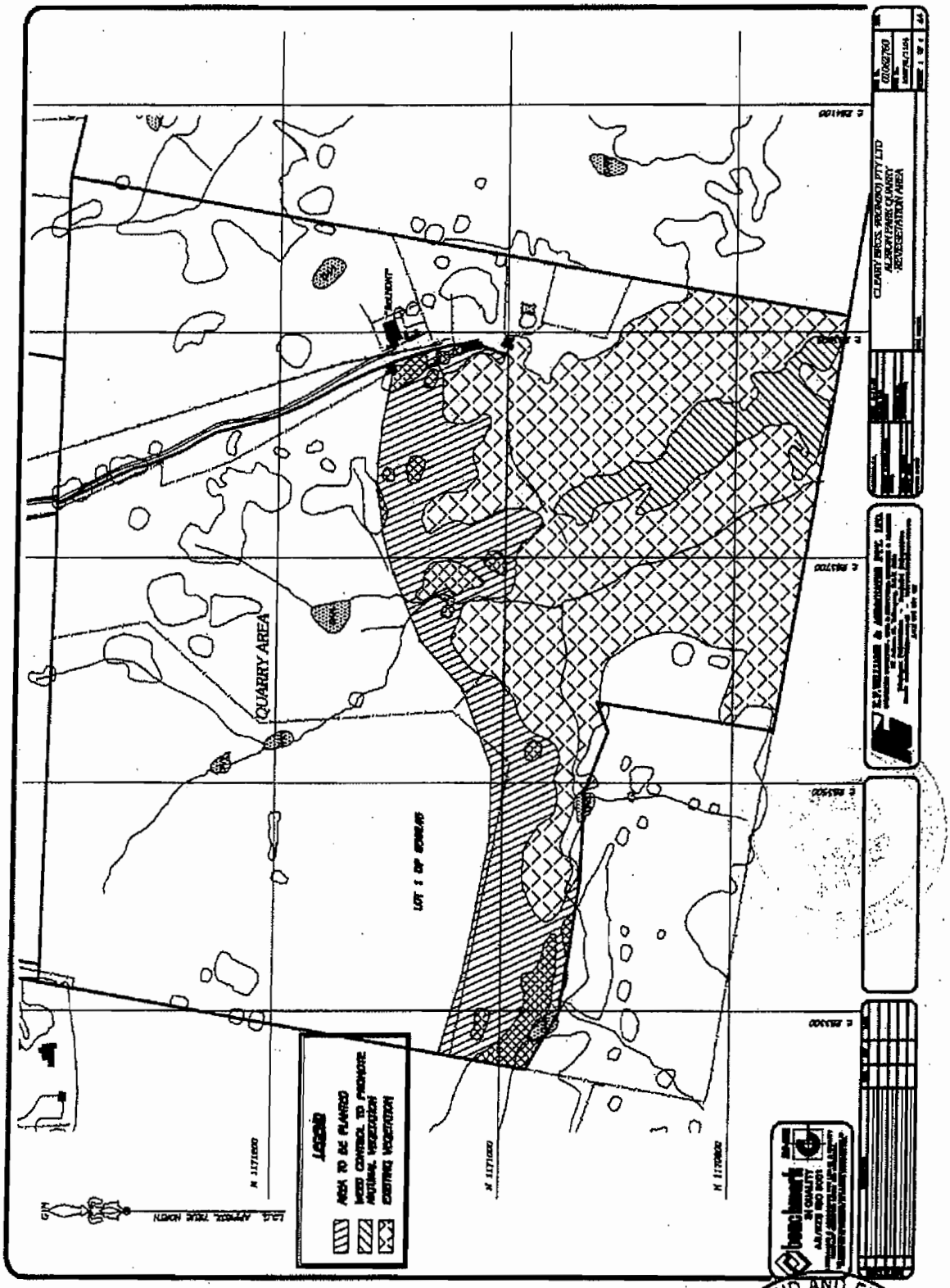
11. During the life of the development, the Applicant shall:
a) make a summary of the results of all monitoring required under this consent publicly available at the Applicant's regional office and on the Applicant's website; and
b) update these results on a regular basis (at least every 6 months),
to the satisfaction of the Director-General.

Note: The Applicant's environmental management plans/protocols should specify the reporting provisions for each environmental aspect.

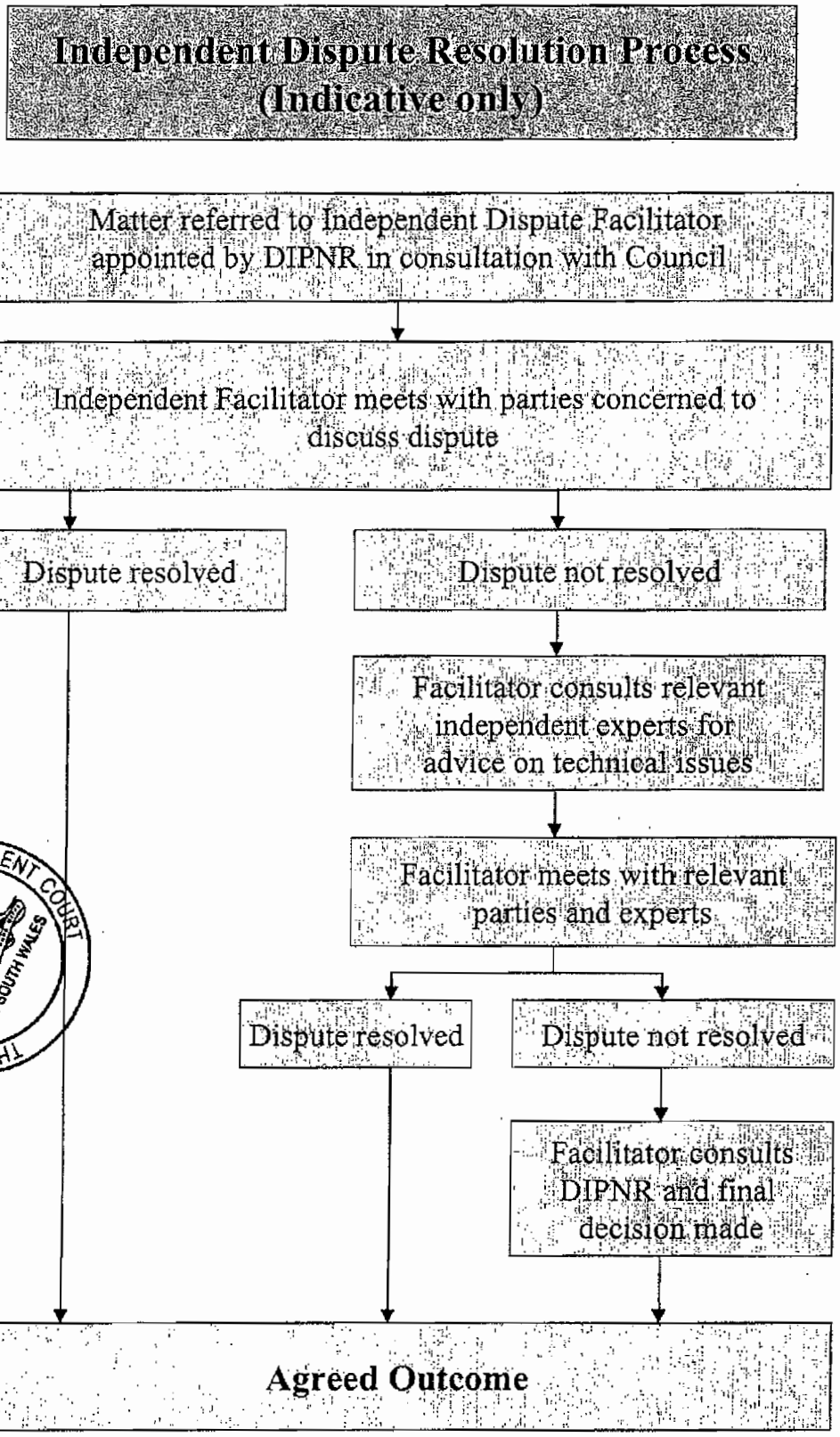
R R Hussey
Commissioner of the Court

G T Brown
Commissioner of the Court

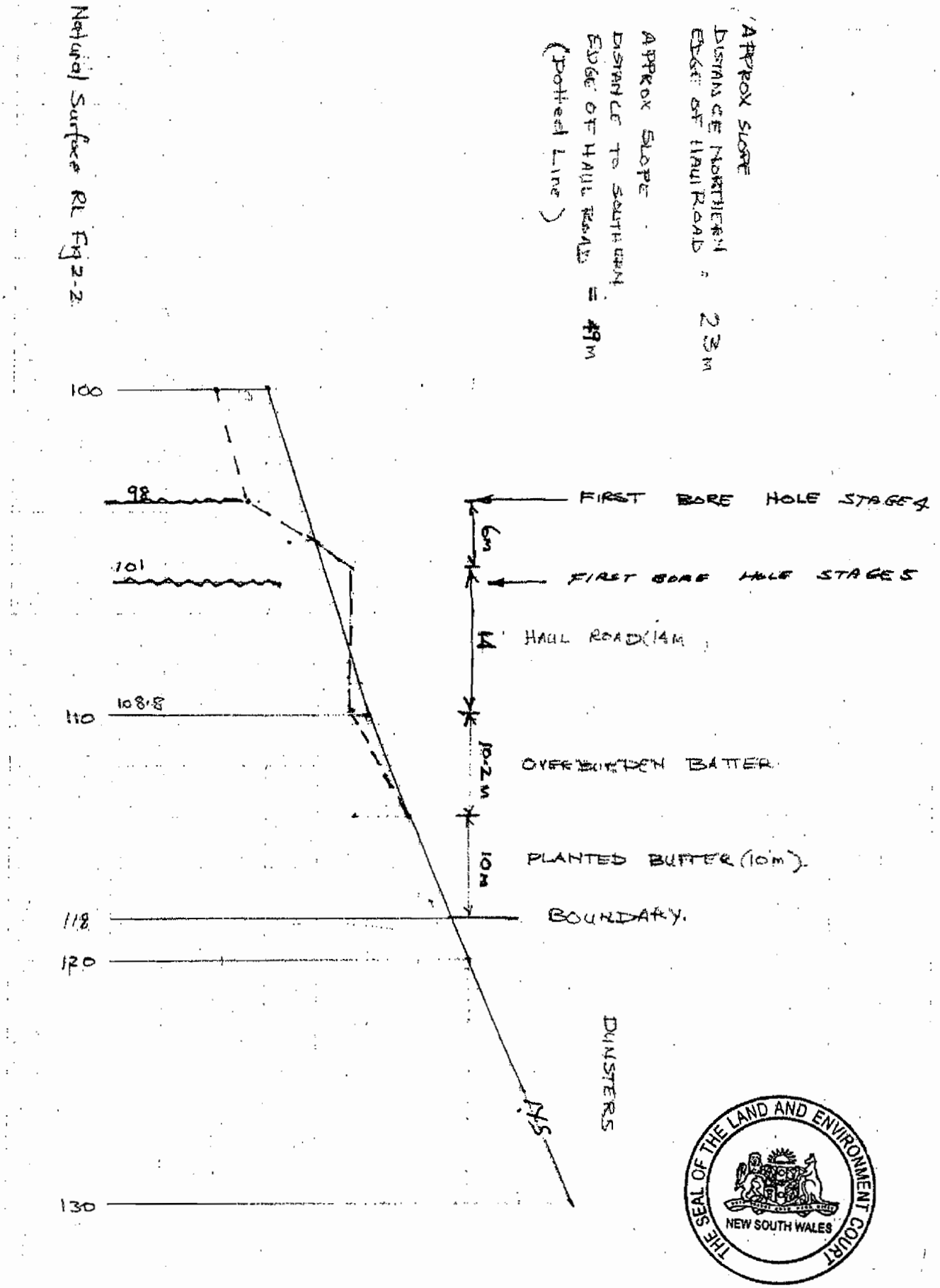
APPENDIX 1
REVEGETATION/REHABILITATION AREA



APPENDIX 2
INDEPENDENT DISPUTE RESOLUTION PROCESS



APPENDIX 3
LANDSCAPE BUND, HAUL ROAD AND BATTERS



CS1

Appendix B

ACCESS ROAD DEVELOPMENT CONSENT

All communication addressed to:
General Manager
Shellharbour City Council
PO Box 155, Shellharbour City Centre
NSW 2529

PHONE: 02 4221 6111
FAX: 02 4221 6016
DX 26402 Shellharbour City Centre
EMAIL: records@shellharbour.nsw.gov.au
WEB: www.shellharbour.nsw.gov.au

11 MAY 2007

FILE COPY

The Manager
Cleary Bros (Bombo) Pty Ltd
PO Box 210
PORT KEMBLA NSW 2505

NOTICE OF DETERMINATION OF A DEVELOPMENT APPLICATION
Issued under the Environmental Planning and Assessment Act 1979 Section 81 (1)(a)

Being the applicant of Development Application No. 614/2006 for consent to the following development:

CONSTRUCT QUARRY ACCESS & HAUL ROAD

LOTS: 1 & 2 DP: 858245
DUNSTERS LANE, CROOM

&

LOT: 23 DP: 1039967
PRINCES HIGHWAY, CROOM

BUILDING CODE OF AUSTRALIA
BUILDING CLASSIFICATION: Not Applicable

Determination date of consent 10 MAY 2007

In accordance with Section 80 of the Act the Development Application has been determined by the GRANTING OF CONSENT UNDER DELEGATED AUTHORITY SUBJECT TO THE CONDITIONS DESCRIBED BELOW.

CONSTRUCTION CERTIFICATE & PCA NOTIFICATION

1. **Before any site works, building, demolition or use is commenced,** the person having the benefit of the development consent must:

   a. obtain a construction certificate from Shellharbour City Council or an accredited certifier (S81A)

   b. appoint a principal certifying authority (S81A).

LEGISLATION

2. The development must be erected in strict conformity with the plans, specifications and conditions approved by Council and in compliance with the requirements of the Environmental Planning Instruments.

COMPLETION OF DEVELOPMENT

3. All conditions of consent must be complied with prior to the use of the access/haul road. The Principal Certifying Authority must issue a certificate verifying all conditions have been satisfied.

EASEMENTS

4. No part of any structure must encroach onto any easement.

ESTABLISHMENT OF RIGHT OF CARRIAGEWAY

5. The quarry access/haul road must be formalised to the satisfaction of Shellharbour City Council as a Right of Way whereby Lot 2, DP 858245 is burdened and Lot 1, DP 858245 and Lot 23, DP 1039967 are benefited by the development.

ERECTION OF SIGNS

6. The principal contractor and the Principal Certifying Authority will need to have a sign (or signs) erected and maintained on the development site that provides their name and contact telephone number (during and outside work hours for the principal contractor), and stating that unauthorised entry to the site is prohibited.

   The principal contractor and Principal Certifying Authority can have separate signs or they can both use one sign if they choose.

QUARRY ACCESS/HAUL ROAD REQUIREMENTS

Structural Details

7. Full engineering/construction details must be submitted to the Principal Certifying Authority prior to the commencement of any work.

ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

8. The applicant must implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation or rehabilitation of the development.

Scope of Development

9. The applicant must carry out the development generally in accordance with:

   a. DA No. 614/2006 and accompanying documentation

   b. Conditions of this consent.

10. If there is any inconsistency between the above, either the conditions of this consent or the most recent document shall prevail to the extent of the inconsistency.

11. The applicant must comply with any reasonable requirement/s of Shellharbour City Council arising from assessment of:

    a. any reports, plans or correspondence that are submitted in accordance with this consent, and

    b. the implementation of any actions or measures contained in these reports, plans or correspondence.

Period of Approval

12. The use of the land for quarry access and haul road shall cease 30 years after the date of the development consent for the Croom hard rock quarry approved by the Land and Environment Court in *Figtree Hill Pty Limited v Cleary Bros (Bombo) Pty Limited and the Minister for Infrastructure and Planning,* Proceedings No. 10639 of 2005, dated 21 February 2006, and thereafter, may only be used for a further 5 years for the purposes of rehabilitation.

Protection of Public Infrastructure

13. The applicant must:

    a. repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development, and

    b. relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development.

Operation of Plant & Equipment

14. The applicant must ensure that all plant and equipment at the site, or used in connection with the development are:

    a. maintained in a proper and efficient condition, and

    b. operated in a proper and efficient manner.

ENVIRONMENTAL PERFORMANCE

Identification of Boundaries

15. Prior to the commencement of works, the applicant must:

    a. engage a registered surveyor to mark out the boundaries of the haul road corridor

    b. submit a survey plan of these boundaries to Shellharbour City Council, and

    c. ensure that these boundaries are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify those limits.

Noise Limits

16. The applicant must ensure that noise generated by the development does not exceed the criteria specified in Table 1 of Development Application No. 466-11-2003 approved by the Land and Environment Court in *Figtree Hill Pty Limited v Cleary Bros (Bombo) Pty Limited and the Minister for Infrastructure and Planning*, Proceeding No. 10639 of 2005, dated 21 February 2006.

Operating Hours

17. The applicant must comply with the operating hours in Table 1.

Activity	Days of the Week	Time
Haulage of material from quarry to processing plant, all site construction activities, rehabilitation works, general plant and maintenance.	Monday – Friday	7.00am – 5.30pm
	Saturday	7.00am – 1.00pm

Table 1: Operating Hours for the Development

18. The following activities may be carried out at the premises outside the hours specified in Table 1:

    a. the delivery of materials as requested by Police or other authorities for safety reasons

    b. emergency work to avoid the loss of lives, property and/or to prevent environmental harm

    c. workshop activities and other maintenance work inaudible a the nearest affected receiver.

AIR QUALITY

Air Quality Criteria

19. The applicant must ensure that the air pollution generated by the development does not cause exceedances of the ambient air quality standards and goals listed in Tables 2, 3 & 4 at any sensitive receiver or residence on privately owned land.

Pollutant	Averaging Period	Criterion
Total suspended particulate (TSP) matter	Annual	90 $\mu g/m^3$
Particulate matter < 10pm (PM_{10})	Annual	30 $\mu g/m^3$

Table 2: Long Term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging Period	Criterion
Particulate matter < 10pm (PM_{10})	24 hour	50 $\mu g/m^3$

Table 3: Short Term Impact Assessment Criterion for Particulate Matter

Pollutant	Averaging Period	Maximum Increase In Deposited Dust Level	Maximum Total Deposited Dust Level
Deposited dust	Annual	2 g/m^2/month	4g/m^2/month

Table 4: Long Term Impact Assessment Criteria For Deposited Dust

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia 2003, AS 3580.10.1 – 1991:Methods for Sampling and Analysis of Ambient Air – Determination of Particulates – Deposited Matter – Gravimetric Method.

Management

20. The site must be maintained in a condition that minimises or prevents the emission of dust from the site, including the prompt and effective rehabilitation of all disturbed areas.

21. The haulage road and unsealed surfaces are to be watered as required to minimise dust generation impacting on the natural or built environment. Dust generating activity must cease in strong winds.

SURFACE & GROUND WATER

Pollution of Waters

22. Except as may be expressly provided by a Environment Protection Licence, the applicant must comply with Section 120 of the *Protection of the Environment Operations Act 1997* during the carrying out of the development.

Management

23. Within 12 months of the date of this consent and prior to the commencement of works, the applicant must prepare and subsequently implement an *Erosion & Sediment Control Plan* for the development, to the satisfaction of Shellharbour City Council. The plan must:

    a. be consistent with the requirements of the Department of Housing's 'Managing Urban Stormwater: Soils & Construction Manual'

    b. identify activities that could cause soil erosion and generate sediment

    c. describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters

    d. describe the location, function and capacity of erosion and sediment control structures, and

    e. describe what measures would be implemented to maintain the structures over time.

Reporting

24. Each year, the applicant must:

    a. review the *Erosion & Sediment Control Plan*

b. update the plan, and

c. report the results of this review in the Annual Environmental Management Report (AEMR) as required by DA 466-11-2003, including:

i. the results of any monitoring
ii. details of the review of the plan
iii. amendments to the plan, and
iv. details of the measures undertaken/proposed to address any identified issues.

FLORA & FAUNA

Vegetation Clearing Protocol

25. Prior to the commencement of works, the applicant must prepare and subsequently implement a Vegetation Clearing Protocol for the development in consultation with the Department of Environment & Conservation (NPWS) and to the satisfaction of Shellharbour City Council. This plan must:

a. delineate the areas of remnant vegetation to be cleared, and

b. describe the procedures that would be implemented for:

- pre-clearance surveys
- progressive clearing
- fauna management
- conserving and reusing topsoil
- collecting seed from the site
- salvaging and reusing materials from the site, and
- controlling weeds

Protection of Flora & Fauna

26. The route of the access road which has been designed, located and approved to minimise the removal of indigenous trees, must be strictly adhered to.

27. The stand of large Forest Red Gum trees near to the haul road route, as shown on Figure 2, Vegetation Map within the Flora & Fauna Assessment of the Statement of Environmental Effects by Perram & Partners, November 2006 112R3, must be fully protected by robust fencing, prior to the commencement of any construction of the haul road. The position of the fencing must be located and certified by a suitably qualified ecological and environmental consultant.

28. The two Fig Trees near to the haul road route must be retained and fully protected by robust barrier fencing prior to the commencement of any earthworks associated with the haul road construction. Earthworks must be carried out in a manner that protects the tree root systems and must be supervised and certified by a suitably qualified ecological and environmental consultant.

29. The area where the endangered vine *Cynanchum elegans* occurs must be protected against construction machinery by robust fencing prior to the commencement of any works on the haul road. The position of the fence must be determined and certified before construction commences by a suitably qualified ecological and environmental consultant.

30. The location of the regionally rare species *Alchorina ilicifolia* and *Abutilon oxycarpum* must be determined by a suitably qualified person and the area fenced if deemed necessary by a suitably qualified ecological and environmental consultant.

31. The exact location of specimens of *Geijera salicifolia* var. *latifolia* must be determined and illustrated on a map which must be submitted to Council prior to any works commencing. Individual plants to be removed must be clearly marked as such, whilst individual plants to be retained must also be clearly marked as such and fenced if deemed necessary. The position of the fencing is to be determined by a suitably qualified ecological and environmental consultant.

32. Throughout the entire project site, no fill is to be placed in such a way that it is against or around any tree, specifically the Forest Red Gum Woodland and the two Fig Trees.

33. Adequate sediment and erosion control must be put in place before construction and maintained throughout the project. Following completion of the project, suitable stabilisation and screening of exposed soil must be undertaken with locally indigenous species.

REHABILITATION

Rehabilitation Management Plan

34. Within six months of the date of this consent, the applicant must prepare and subsequently implement a *Rehabilitation Management Plan* for the site in consultation with Shellharbour City Council. This plan must:

    a. identify the disturbed area at the site

    b. describe in general the short, medium and long term measures that would be implemented to rehabilitate the site (including the decommissioning of the haul road the return to the natural ground levels a the expiration of the quarrying process)

    c. describe in detail the measures that would be implemented over the next five years to rehabilitate the site, and

    d. describe how the performance of these measures would be monitored over time.

Reporting

35. The applicant must include a progress report on the *Rehabilitation Management Plan* in the AEMR.

TRAFFIC & TRANSPORT

Site Access

36. All access to the quarry extension site (following construction of the haul road) is to be via the roundabout at East/West Link Road.

37. The applicant must not cause any heavy vehicle movements along Dunsters Lane, except in an emergency, as agreed by the Director/General of the Department of Planning in consultation with Shellharbour City Council.

Road Haulage

38. The applicant must ensure that all loaded vehicles entering or leaving the site are covered.

39. The applicant must ensure all loaded vehicles leaving the site are cleaned of materials that may fall on the road before they are allowed to leave the site.

HERITAGE

40. Within three months of the date of this consent and prior to the disturbance of any relic, the applicant must prepare and subsequently implement a *Heritage Management Plan* for the development, in consultation with NSW Heritage Office and to the satisfaction of Shellharbour City Council. The plan must include:

    a. archival recording of the 'Kyawana' property and other heritage elements affected by the development, in accordance with the *NSW Heritage Office Manual.*

    b. a plan for providing Council the opportunity to salvage any relic proposed to be destroyed by the development, including 'Kyawana'.

    c. should any indigenous archaeological material be located or disturbed during construction, measures to immediately mitigate any potential or proposed impacts on the heritage site. The plan must include options or alternatives to modification for especially sensitive or culturally significant sites.

    d. a procedure for obtaining permits under the *Heritage Act* prior to disturbance of any relic and permits under the *National Parks & Wildlife Act* prior to disturbance of any Aboriginal objects or archaeological remains located or identified during the haul road construction.

Reporting

41. The applicant must include a progress report on the *Heritage Management Plan* in the AEMR.

VISUAL IMPACT

Visual Amenity

42. The applicant must minimise the visual impacts of the development to the satisfaction of Shellharbour City Council.

43. The haul road batters and screen plantings must be designed and established in accordance with a landscape plan prepared in consultation with Shellharbour City Council. The landscape plan must be submitted with the Construction Certificate documentation and must be prepared by a suitably qualified landscape architect with heritage experience and must have regard to the cultural landscape of Wentworth Hills. The plant list within the Statement of Environmental Effects must be used for plant selection.

44. Following construction of any visual/noise bund, the applicant must undertake a review of its effectiveness with Shellharbour City Council and undertaken any improvements as required by Council.

45. Any bund on Lot 2, DP 858245 or Lot 23, DP 1039967 must be constructed in a manner to compliment the existing landscape. In this regard, the bund must be shaped and planted/seeded with grass and/or indigenous plants so that it blends with the existing hillside.

EMERGENCY & HAZARDS MANAGEMENT

Dangerous Goods

46. The applicant must ensure that the storage, handling and transport of dangerous goods is done in accordance with the relevant Australian Standards, particularly AS 1940 and AS 1596 and the *Dangerous Goods Code*.

Safety

47. The applicant must secure the development to ensure public safety to the satisfaction of the Principal Certifying Authority.

ENGINEERING

48. Detailed engineering plans of proposed road and associated drainage, prepared by an appropriately qualified engineer, must be submitted as part of the Construction Certificate application. The detailed plans must be to the satisfaction of the Principal Certifying Authority and must be certified by the design engineer that the pavement is adequate for the expected traffic loadings from a development of this size and type.

REASONS FOR THE IMPOSITION OF CONDITIONS

1. To minimise any possible adverse environmental impacts of the proposed development.

2. To ensure that the amenity and character of the surrounding area is protected.

3. To ensure that the design and siting of the development complies with the provisions of Environmental Planning Instruments and Council's Codes and Policies.

4. To ensure that the development does not conflict with the public interest.

SUPPLEMENTARY ADVICE

1. This development consent is subject to the prescribed conditions under Part 7 of the *Environmental Planning & Assessment Regulation 1998*.

2. Failure to comply with any of the conditions of consent may result in a Penalty Infringement Notice of $600 being issued against the owner/applicant/builder.

NOTES:

1. In accordance with Section 95 of *the Environmental Planning & Assessment Act 1979*, the development approval lapses five years after the approval date unless building, engineering or construction work relating to the building has physically commenced.

2. **Right of Appeal**

   If you are dissatisfied with this decision, Section 97 of the *Environmental Planning & Assessment Act 1979*, gives you the right to appeal to the Land & Environment Court within 12 months after the date on which you receive this notice.

   Section 97 of the *Environmental Planning & Assessment Act 1979* does not apply to the determination of a development application for state significant development or local designated development that has been the subject of a Commission of Inquiry.

3. **Review of determination**

If you are dissatisfied with this decision, Section 82A of the *Environmental Planning & Assessment Act, 1979*, provides that you may request Council to review its determination. The request cannot be made after the time limit for making of an appeal under Section 97 expires.

Section 82A of the *Environmental Planning & Assessment Act, 1979*, does not apply to:

a. a determination to issue or refuse to issue a complying development certificate

b. a determination in respect of designated development

c. a determination in respect of integrated development

d. a determination made by the Council under Section 116E in respect of an application made by the Crown.

4. The plans and/or conditions of this consent are binding and may only be varied upon **application** to Council under Section 96 of the *Environmental Planning & Assessment Act 1979*. The appropriate fee must accompany the application and no action shall be taken on the requested variation **unless and until** the **written** authorisation of Council is received by way of an amended consent.

5. **Prescribed Payment System Tax Obligations**

You may have a taxation obligation under the Prescribed Payment System. For more information, contact the Australian Taxation Office on telephone 132866.

6. **Erection of Signs**

A maximum penalty of 10 penalty units ($1,100) applies for failure to erect and maintain sign(s) detailing principal contractor and principal certifying authority identification.

7. **Critical Stage Inspections**

In the case of a Class 5, 6, 7, 8 or 9 building, the development site must be inspected:

i. at the commencement of the building work
ii. prior to covering any stormwater drainage connections
iii. after the building work has been completed and prior to any occupation certificate being issued in relation to the building

8. **Altered Position of Haul Road**

The altered position of the haul road for the Croom hard rock quarry consent granted by the Land and Environment Court: *Figtree Hill v Cleary Bros (Bombo) Pty Limited and the Minister for Infrastructure and Planning*, Proceedings No. 10639 of 2005, dated 21 February 2006 may need to be the subject of an application to vary consent.

Graham Mitchell
Manager Development Services

On behalf of Brian A Weir, General Manager

Appendix C

ENVIRONMENT PROTECTION LICENCE

Section 55 Protection of the Environment Operations Act 1997

Environment Protection Licence

Licence - 299

Licence Details	
Number:	299
Anniversary Date:	30-September
Review Due Date:	11-Jul-2010

Licensee

CLEARY BROS (BOMBO) PTY LTD
PO BOX 210
PORT KEMBLA NSW 2505

Licence Type

Premises

Premises

CLEARY BROS (BOMBO) PTY LTD
LOT 3 PRINCES HIGHWAY
ALBION PARK RAIL NSW 2527

Scheduled Activity

Concrete Works
Extractive Industries
Mines

Fee Based Activity	Scale
Concrete Batching (30)	> 13000 - 25000 m3 produced
Hard-Rock Gravel Quarrying (36)	> 100000 - 500000 T obtained
Mining (Other than Coal) (64)	> 100000 - 500000 T obtained

Region

Metropolitan
Level 3, NSW Govt Offices, 84 Crown Street
WOLLONGONG NSW 2500
Phone: 02 4224 4100
Fax: 02 4224 4110

PO Box 513 WOLLONGONG EAST
NSW 2520

Environment Protection Licence

Licence - 299

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act); and
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

The EPA publication "A Guide to Licensing" contains information about how to calculate your licence fees.

The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

CLEARY BROS (BOMBO) PTY LTD
PO BOX 210
PORT KEMBLA NSW 2505

subject to the conditions which follow.

1 Administrative conditions

A1 What the licence authorises and regulates

A1.1 Not applicable.

A1.2 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity
Concrete Works
Extractive Industries
Mines

Fee Based Activity	Scale
Concrete Batching (30)	> 13000 - 25000 m3 produced
Hard-Rock Gravel Quarrying (36)	> 100000 - 500000 T obtained
Mining (Other than Coal) (64)	> 100000 - 500000 T obtained

A1.3 Not applicable.

A2 Premises to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
CLEARY BROS (BOMBO) PTY LTD
LOT 3 PRINCES HIGHWAY
ALBION PARK RAIL
NSW
2527
LOT 3 DP 858245, LOT 1 DP 359108, TEMPORARY ACCESS TO A PORTION (11540 SQ. METRES) OF LOT 2 DP 858245 AS SHOWN ON PLAN REF: KF106208 DATED: 25-6-04.

Premises Details

A3 Other activities

A3.1 Not applicable.

A4 Information supplied to the EPA

A4.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
(a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
(b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to air and water and applications to land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

Air

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Description of Location
1	Dust deposition monitoring		APD 1 - approximately 200 metres west of the crushing and screening plant and labelled as APD1 on drawing No ESA PQ011 (Rev 1) titled "Water Pollution Control Plan" for Lic 299.
2	Dust deposition monitoring		APD 2 - approximately 100 metres east of quarry area and labelled as APD2 on drawing No ESA PQ011 (Rev 1) titled "Water Pollution Control Plan" for Lic 299.
3	Dust deposition monitoring		APD 3 - approximately 150m south east of main holding and sedimentation dam and and labelled as APD3 on drawing No ESA PQ011 (Rev 1) titled "Water Pollution Control Plan" for Lic 299.

P1.2 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

P1.3 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

Water and land

EPA identification no.	Type of monitoring point	Type of discharge point	Description of location
4	Effluent Quality Monitoring - Discharge to waters	Effluent Quality Monitoring - Discharge to waters	Outlet of main holding and sedimentation pond and labelled as 'sampling DP1' on drawing No ESA PQ011 (Rev 1) titled "Water Pollution Control Plan" for Lic 299.
5	Effluent Quality Monitoring - Discharge to waters	Effluent Quality Monitoring - Discharge to waters	See drawing No ESA PQ011 (Rev 1) titled "Water Pollution Control Plan" for Lic 299.

3 Limit conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Load limits

L2.1 Not applicable.

L2.2 Not applicable.

L3 Concentration limits

L3.1 For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L3.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L3.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.

Water and Land

POINT 4

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile Concentration Limit
Total suspended solids	milligrams per litre				50

POINT 5

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile Concentration Limit
Oil and Grease	milligrams per litre				30
Total suspended solids	milligrams per litre				50
Biochemical oxygen demand	milligrams per litre				150

L4 Volume and mass limits

L4.1 Not applicable.

L5 Waste

L5.1 Not applicable.

L6 Noise Limits

L6.1 The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not:
(a) Exceed 5mm/sec for more than five per cent of the total number of blasts carried out on the premises within the 12 months annual reporting period.

L6.2 The overpressure level from blasting operations on the premises must not:
(a) Exceed 115dB(L) for more than five per cent of the total number of blasts carried out on the premises within the 12 months annual reporting period.

The airblast overpressure values stated above apply when the measurements are performed with equipment having a lower cut-off frequency of 2Hz or less. If the instrumentation has a higher cut-off frequency then a correction of 5dB should be added to the measure value. Equipment with a lower cut-off frequency exceeding 10Hz should not be used for the purpose of measuring airblast overpressure.

L6.3 Blasting operations at the premises may only take place between 8:30am – 5:00pm Monday to Friday. Where compelling safety reasons exist, the Authority may permit a blast to occur outside the abovementioned hours. Prior written (or facsimile) notification of any such blast must be made to the Authority.

4 Operating conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.

This includes:
(a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
(b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
(a) must be maintained in a proper and efficient condition; and
(b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust.

O4 Effluent Re-use

O4.1 The quantity of effluent/solids applied to the utilisation area must not exceed the capacity of the area to effectively utilise the effluent/solids.

For the purpose of this condition, 'effectively utilise' includes the use of the effluent/solids for pasture or crop production, as well as the ability of the soil to absorb the nutrient, salt, hydraulic load and organic material. If weather or soil condition preclude irrigation, the holding tanks must not overflow and effluent must be tankered away and disposed of in a manner which does not pollute waters.

O4.2 A minimum of 2500 square metres must be retained for use as the wastewater utilisation area.

5 Monitoring and recording conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:

(a) in a legible form, or in a form that can readily be reduced to a legible form;
(b) kept for at least 4 years after the monitoring or event to which they relate took place; and
(c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
(a) the date(s) on which the sample was taken;
(b) the time(s) at which the sample was collected;
(c) the point at which the sample was taken; and
(d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Ash	grams per square metre per month	Monthly	Australian Standard 3580.10.1-1991
Insoluble solids	grams per square metre per month	Monthly	Australian Standard 3580.10.1-1991

POINT 2

Pollutant	Units of measure	Frequency	Sampling Method
Ash	grams per square metre per month	Monthly	Australian Standard 3580.10.1-1991
Insoluble solids	grams per square metre per month	Monthly	Australian Standard 3580.10.1-1991

POINT 3

Pollutant	Units of measure	Frequency	Sampling Method
Ash	grams per square metre per month	Monthly	Australian Standard 3580.10.1-1991
Insoluble solids	grams per square metre per month	Monthly	Australian Standard 3580.10.1-1991

POINT 4

Pollutant	Units of measure	Frequency	Sampling Method
Total suspended solids	milligrams per litre	Each overflow event	Grab sample

POINT 5

Pollutant	Units of measure	Frequency	Sampling Method
Biochemical oxygen demand	milligrams per litre	Quarterly	Grab sample
Oil and Grease	milligrams per litre	Quarterly	Grab sample
Total suspended solids	milligrams per litre	Quarterly	Grab sample

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

(a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or

(b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or

(c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The Protection of the Environment Operations (Clean Air) Regulation 2002 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Recording of pollution complaints

M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M4.2 The record must include details of the following:

(a) the date and time of the complaint;
(b) the method by which the complaint was made;
(c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
(d) the nature of the complaint;
(e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
(f) if no action was taken by the licensee, the reasons why no action was taken.

M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose

of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M5.3 Conditions M5.1 and M5.2 do not apply until 3 months after:
(a) the date of the issue of this licence or
(b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.

M6 Requirement to monitor volume or mass

M6.1 Not applicable.

M7 Requirement to monitor blasting

M7.1 Each production blast must be monitored and recorded at the permanent station established near the Dunster residence.

M7.2 To determine compliance with Conditions L6.1 and L6.2:
(a) Airblast overpressure and ground vibration levels must be measured for all production blasts carried out in or on the premises; and
(b) The written record must include:
(i) the time and date of each blast;
(ii) the station(s) at which the noise was measured;
(iii) the ground vibration for each blast;
(iv) the airblast overpressure for each blast;
(v) evidence that during the past 12 month period, a calibration check had been carried out on each blast monitor to ensure accuracy of the reported data; and
(vi) the waveform for the ground vibration and overpressure for each blast that exceeds a ground vibration of 5mm/sec (peak particle velocity) or an airblast overpressure of 115dB(L).
(c) Instrumentation used to measure the airblast overpressure and ground vibration levels must meet the requirements of Australian Standard 2187.2 of 1993.

6 Reporting conditions

R1 Annual return documents

What documents must an Annual Return contain?

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
(a) a Statement of Compliance; and
(b) a Monitoring and Complaints Summary.
A copy of the form in which the Annual Return must be supplied to the EPA accompanies this licence. Before the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

Period covered by Annual Return

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:
(a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
(b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
(a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
(b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

Deadline for Annual Return

R1.5 The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

Notification where actual load can not be calculated

R1.6 Not applicable.

Licensee must retain copy of Annual Return

R1.7 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

Certifying of Statement of Compliance and signing of Monitoring and Complaints Summary

R1.8 Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

(a) the licence holder; or
(b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R1.9 A person who has been given written approval to certify a certificate of compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review of this licence.

R2 Notification of environmental harm

Note: The licensee or its employees must notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.1 Notifications must be made by telephoning the EPA's Pollution Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
(a) where this licence applies to premises, an event has occurred at the premises; or
(b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
(a) the cause, time and duration of the event;
(b) the type, volume and concentration of every pollutant discharged as a result of the event;
(c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
(d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
(e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
(f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
(g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it

is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

R4 Reporting of blasting monitoring

R4.1 The results of the blast monitoring required by Condition M7.2 must be submitted to the EPA on a weekly basis.

General conditions

G1 Copy of licence kept at the premises

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

Pollution studies and reduction programs

U1.1 Not applicable.

Special conditions

E1 Not applicable.

Dictionary

General Dictionary

In this licence, unless the contrary is indicated, the terms below have the following meanings:

3DGM [in relation to a concentration	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or

limit]	more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 1998.
flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
industrial waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
inert waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
reprocessing of waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
treatment of waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements

Environment Protection Licence

utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste code	Means the waste codes listed in Appendix 5 of the EPA document A Guide to Licensing Part B.
waste type	Means Group A, Group B, Group C, inert, solid, industrial or hazardous waste

Mr Nigel Sargent

Environment Protection Authority

(By Delegation)

Date of this edition - 16-Mar-2006

End Notes

1	Licence varied by notice 1003792, issued on 17-Jul-2002, which came into effect on 11-Aug-2002.
2	Licence varied by notice 1038336, issued on 30-Jun-2004, which came into effect on 05-Jul-2004.
3	Licence varied by change to DEC Region allocation, issued on 16-Mar-2006, which came into effect on 16-Mar-2006.

Appendix D

EQUIPMENT SOUND POWER LEVELS

EQUIPMENT SOUND POWER LEVELS

Equipment used in the quarry operation will be selected and maintained to achieve the sound power levels in the following table. These levels were determined from measurements of equipment in use at Cleary Bros Albion Park quarry in 2001. The sound power levels were then used for modelling noise impacts from the quarry extension. The validity of the modelling and noise predictions is dependent upon the sound power levels of quarry equipment not exceeding the levels in the table.

Equipment	Sound Power Levels
Processing Plant	
Primary crusher	112 dBA
Secondary crushers and screens	116 dBA
Pug mill	115 dBA
Mobile Equipment	
CAT 773 dump truck	114 dBA
CAT 627 scraper*	111 dBA
CAT 245 face shovel	117 dBA
CAT 992 loader	118 dBA
Rock drill	118 dBA
Water cart	109 dBA
CAT D8L dozer	116 dBA
235C hammer excavator*	112 dBA
CAT 980C loader	114 dBA

Source: Noise and Blasting Impact Assessment, Cleary Bros Albion Park Quarry – Richard Heggie Associates, December 2002.

Appendix E

QUARRY VEGETATION MANAGEMENT PLAN

VEGETATION MANAGEMENT PLAN

ALBION PARK HARD ROCK QUARRY
CLEARY BROS (BOMBO) PTY LIMITED

a report prepared by

KEVIN MILLS & ASSOCIATES
ECOLOGICAL AND ENVIRONMENTAL CONSULTANTS

October 2007
05/044

VEGETATION MANAGEMENT PLAN

ALBION PARK HARD ROCK QUARRY
CLEARY BROS (BOMBO) PTY LIMITED

report prepared by

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for

CLEARY BROS (BOMBO) PTY LIMITED
PO BOX 210
PORT KEMBLA NSW 2505

October 2007
05/044

Kevin Mills & Associates Pty Limited ACN 003 441 610
as trustee for Kevin Mills & Associates Trust

VEGETATION MANAGEMENT PLAN
ALBION PARK HARD ROCK QUARRY
CLEARY BROS (BOMBO) PTY LIMITED

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APPENDICES

TABLES

VEGETATION MANAGEMENT PLAN

ALBION PARK HARD ROCK QUARRY
CLEARY BROS (BOMBO) PTY LIMITED

PART 1. INTRODUCTION

1 INTRODUCTION

1.1 BACKGROUND

This report was prepared by Kevin Mills & Associates, Ecological and Environmental Consultants, on behalf of Cleary Bros (Bombo) Pty Limited, the owners and operators of the Albion Park hard rock quarry at Albion Park in the City of Shellharbour. The document was prepared in response to conditions of consent attached to an application to expand the existing hard rock quarry onto the nearby land.

1.2 PURPOSE OF THE DOCUMENT

The purpose of this Vegetation Plan of Management is to provide a detailed guide for the protection, management and enhancement of the native vegetation and habitats on the Albion Park hard rock quarry. In particular, the Plan aims to address the following matters listed in the Conditions of Consent for the quarry.

> "37. Vegetation Management Plan
> Within 6 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Vegetation Management Plan for the development in consultation with Shellharbour City Council and the DEC (NPWS), and to the satisfaction of the Director-General. The plan shall be prepared by a suitably qualified ecologist/bush regenerator, and shall address:
> a) establishment of baseline data for existing vegetation and habitat in the area;

b) vegetation management on all areas of the site outside the working area of the quarry;
c) conservation, maintenance and enhancement of threatened communities, including 'Illawarra Subtropical Rainforest' and 'Illawarra Lowlands Grassy Woodlands';
d) conservation, maintenance and enhancement of threatened plant species, including *Cynanchum elegans* (White Cynanchum), *Daphandra* sp. *aff. micrantha* (Illawarra Socketwood), and *Zieria granulata* (Illawarra Zieria);
e) establishment and maintenance of vegetation/habitat for threatened fauna species, including the Grey-headed flying-fox;
f) ongoing weed control and maintenance;
g) a program for how the performance of the measures described in (b) to (f) above would be monitored over time;
h) a program for monitoring the effect of quarrying, including water management, on vegetation communities.

38. Reporting

The Applicant shall include a progress report on the implementation of the Vegetation Management Plan in the AEMR."

The following areas to be covered by the Vegetation Management Plan are set out in the conditions of consent.

"35. Southern Remnant Vegetation and Revegetation Area

The Applicant shall conserve and maintain the areas of remnant vegetation marked on the map in Appendix 1.

36. The Applicant shall revegetate/rehabilitate and maintain the areas marked 'Area to be Planted' and 'Weed Control to Promote Natural Vegetation' on the map in Appendix 1. Revegetation shall be in accordance with the Vegetation Management Plan described in Condition 37."

The management actions are set out in the next section as a 'work instruction', the format most familiar to quarry staff at Cleary Bros (Bombo). The work instruction is presented at the beginning of the document for ease of use on the site. Management actions are derived from the issues discussed later in this report.

The "map in Appendix 1" referred to in conditions 35 and 36 above is included in the work instruction.

PART 2. THE WORK INSTRUCTION

Cleary Bros (Bombo) Pty Limited – Quarry Division
Albion Park Hard Rock Quarry – Work Instruction

RESTORATION AND REVEGETATION OF NATIVE VEGETATION

1.0 Purpose and Scope

This work instruction describes the methods to be employed in the restoration and revegetation of native vegetation to the identified area around the Albion Park hard Rock Quarry Extension.

2.0 References

2.1 2006 Development Consent for the Albion Park Hard Rock Quarry Extension (L & E Court).

2.2 Environmental Impact Statement for the Albion Park Quarry Extension (Perram & Partners 2003).

2.3 Flora and Fauna Study for the Albion Park Quarry Extension (Kevin Mills & Associates 2003).

2.4 Vegetation clearing protocol and vegetation conservation plan, access road for Albion Park hard rock quarry, Cleary Bros (Bombo) Pty Limited (Kevin Mills & Associates 2007).

3.0 Definitions

3.1 *Quarry Area*

The area containing the quarry extension and adjacent land within Cleary Bros property delineated as the *identified area*.

3.2 *Identified Area*

The area adjoining the quarry shown on the attached plan and defined in the Conditions of Consent for the quarry extension.

3.3 *Restoration Area*

The areas identified on the accompanying plan where the primary management objective is to control weeds and allow natural regeneration of native plants to take place.

3.4 *Revegetation Area*
The areas identified on the accompanying plan where the primary management objective is to undertake plantings of native species and to control weeds and undertake other measures to ensure they successfully grow.

3.5 *Native Vegetation*
Vegetation that is indigenous to the site, i.e. occurs there naturally; this includes plant species and communities,

3.6 *Threatened Species*
Threatened species, including plant and animal species, populations and ecological communities that are identified under the *Threatened Species Conservation Act 1995* (NSW).

3.7 *Responsible Staff Member*
The on-site staff person or persons given the task by Cleary Bros (Bombo) Pty Limited of ensuring that the provisions in this Vegetation Management Plan are satisfactorily implemented.

4.0 Objectives

4.1 Ensure that the development of the quarry, haul road and associated works do not impact upon the existing stands of native vegetation outside the quarry area.

4.2 Successfully rehabilitate and expand the existing areas of Illawarra Subtropical Rainforest and Illawarra Lowlands Grassy Woodland on the identified land adjoining the quarry.

4.3 Successfully control problem weeds in the area, particularly noxious weeds and weeds that are impacting significantly upon the native vegetation and rehabilitation efforts.

4.4 Implement other measures to ensure the success of the restoration and revegetation of the identified land.

5.0 Delineation and Protection of the Identified Land

5.1 The responsible staff officer will ensure that the interface between the quarry and the existing vegetation and proposed revegetation areas is fenced; i.e. along the boundary of the identified area. The location of this fencing is indicated on the plan accompanying the consent conditions. This fence will be a four-strand plain wire fence, with gate access as required for maintenance vehicles. If

necessary, this fence will be temporarily highlighted (e.g. with orange plastic fencing) while excavation work is being undertaken in that particular area to alert machine operators of its existence.

5.2 The responsible staff member will ensure that storage of spoil or other material does not occur within the above fenced area. To improve the growing area "topsoil" may be used in some locations within the revegetation area but not the restoration areas to improve the growing area. This will be at the discretion of the bush regenerators working on the site.

5.3 The responsible staff officer will ensure that storage of materials, spoil or stockpiles is not permitted close to the fence where it may impact on the fenced area; erosion control structures such as silt fences may be required in such circumstances.

5.4. Prior to the construction of the above fence, all foreign material, for example dumped rubbish, old fences, etc, is to be removed from the identified land.

5.5 All personnel working on the site will undergo an induction program that includes stressing that the fenced identified land is a "no go" zone for vehicles or disturbance under any circumstances.

5.6 Signs will be erected at 100 metre intervals along the fenced boundary to indicate the identified land and that there should be no unauthorised vehicle entry or disturbance to the area.

6.0 Restoration and Revegetation

6.1 Detailed information on the native vegetation in the identified area is contained in the reports by Kevin Mills & Associates referenced herein; these should be perused for background information.

6.2 Site treatment – Restoration Zone. The aim within the restoration zone is to minimise unnecessary disturbance to the soil and the existing native vegetation growing there. Other than painting Lantana stumps with an approved herbicide, no chemicals are to be used within this zone. Primarily, the aim is to allow the existing native plants that are colonising the area to grow unencumbered by weeds. The main action within this zone, then, is the removal of weeds and allow the natural regeneration of the natives to occur.

6.3 Site treatment – Revegetation Zone. This zone is mainly covered in exotic grasses and herbaceous species. The main aim is to undertake plantings of suitable local native plants and to control weeds that would compete with these plantings.

6.4 Plants to be used. The native plants to be used have been selected from those listed in Appendix 1 and are recommended in sections 6.7 and 6.8 below. These plants should be sourced from the approved nursery.

6.5 Obtaining plant stock. Plants of the selected species will be obtained from a nursery that has propagated them from plant material obtained in the local area or, alternatively, has propagated them from plant material obtained on site, under contract from the company. Depending on the weather conditions at the time, it may be possible to transplant some small plants and seedlings from the quarry expansion site, which is to be cleared.

6.6 Weed control. The most important weeds on the quarry site are listed below. The most important weeds are declared noxious within the City of Shellharbour under the *Noxious Weeds Act 1993;* the landowner has a legal responsibility to control these weeds. Other weeds, termed environmental weeds, may also become important within the restoration and revegetation areas.

Noxious Weeds	
African Box-thorn	*Lycium ferocissimum*
Shrub	Noxious (W2). Rare on the site.
Blackberry	*Rubus fruticosus*
Scrambling shrub	Noxious (W2). Scattered small patches.
Prickly Pear	*Opuntia stricta*
Succulent herb	Noxious (W4). Rare on the site.
Environmental Weeds	
Castor Oil Plant	*Ricinus communis*
Large herb	Mostly on disturbed ground; can form large colonies if not treated. Occasional on the site.
Crofton Weed	*Ageratina adenophora*
Large herb	Significant weed of moist places.
Lantana	*Lantana camara*
Scrambling shrub	Rampant invasive species, forms large thickets if left unchecked. Common on the site.
Large-leaved Privet	*Ligustrum lucidum*
Small tree	Occasional in treed areas.
Madeira Vine	*Anredera cordifolia*
Vine	Occasional to common amongst Lantana.
Mist Flower	*Ageratina riparia*

Shrub	Common in moist areas.
Moth Vine	*Araujia sericiflora*
Vine	Common amongst Lantana.
Noogoora Burr	*Xanthium occidentale*
Large herb	Mainly on disturbed areas.
Small-leaved Privet	*Ligustrum sinense*
Shrub, small tree	Occasional in treed areas.

6.7 Plantings – Restoration Zone. The restoration management zone is delineated on the attached plan. The principal works required in this management zone are set out below.

a. Weeds

Remove the following weeds, if present:

African Box Thorn
Lantana
Prickly Pear

b. Plantings

Planting of the following species would be appropriate, although the purpose of this zone is to allow natural regeneration once weeds have been removed. Note that a full list is provided in Appendix 1.

Acmena smithii
Acronychia oblongifolia
Alphitonia excelsa
Brachychiton acerifolius
Dendrocnide excelsa
Elaeodendron australe
Ficus macrophylla
Ficus rubiginosa
Guioa semiglauca
Livistona australis
Melia azedarach
Pittosporum undulatum
Planchonella australis
Toona ciliata

Eucalypt Woodland

Eucalyptus bosistoana
Eucalyptus quadrangulata
Eucalyptus tereticornis
Melaleuca styphelioides

6.8 Plantings – Revegetation Zone. The revegetation management zone is delineated on the attached plan. The principal works required in this management zone are set out below.

a. Weeds

Remove the following weeds as soon as possible, if present:

African Box Thorn
Lantana
Prickly Pear

b . Plantings

Planting of the following species would be appropriate, these have been selected as they are relatively hardy and will grow in open situations. Note that a full list is provided in Appendix 1. Planting of other species to be undertaken when some tree cover is established (see above).

Acacia binervata
Acmena smithii
Alphitonia excelsa
Commersonia fraseri
Ficus macrophylla
Ficus rubiginosa
Glochidion ferdinandi
Melia azedarach
Myoporum acuminatum
Pittosporum undulatum
Rapanea variabilis
Streblus brunonianus

6.9 Watering. The need for watering will depend upon local rainfall. The initial plantings will be planted with water-holding crystals and watered once at the time of planting. Follow-up watering will occur at least once per week, depending on rainfall. The need for watering will be reduced by the use of water-holding crystals and by mulching around each plant. Watering will cease or be curtailed when the plants are large enough to survive without; this will encourage deeper root growth and better plant health.

6.10 Fertilising. The use of strong fertilisers is generally avoided in native planting projects. However, a couple of tablets of a slow-release fertiliser in the hole at the time of planting can be beneficial.

6.11 Protection from grazing animals. Grazing stock will be excluded from the site by fencing. Grazing by rabbits and possibly swamp wallabies may have to be addressed; bagging individual plants should provide enough protection.

6.12 Planting Methods. The following planting methods will be used.

Plant Spacing

Trees and shrubs will be planted at a spacing of no more than two (2) metre centres. Ground cover plants will be planted at a density of two plants per square metre.

Plant Protection

The staking of individual plants will be avoided, as it requires much effort and may be detrimental to the plant, which should be left to grow naturally. Placing plastic bags or 'Grow Tubes' around each plant can improve the success rate. These plant guards are used to protect the plant from grazing animals, reduce weed competition, reduce wind and frost effects, and lower evaporation rates around the plant. Treating individual plants can be high maintenance, but the results are usually worth the effort.

Plant Size

Tubestock or similar sized plants will be used for all plantings. Advanced plants are not usually successful in this type of project and should not be used.

Planting Configuration

For aesthetic reasons, the plants should not be planted in rows, lines or grid patterns. The plantings should be at random, with an average density as set out above.

Individual Planting Method

Each plant will be placed in a hole of suitable size. Two slow-release fertiliser tablets will be placed at the bottom of the hole, and a handful of water-holding crystals placed around the plant as the hole is filled in. A tree guard (e.g. plastic bag) will be placed around the planted trees and shrubs, although this may not be necessary for the ground cover plants. Each plant will be watered immediately after planting. The area around the plant will be mulched as soon as possible after planting, as each section is completed.

6.13 Use of mulched debris. All trees and shrubs cleared from the construction area to be mulched on site, the mulch to be utilised on site in landscaping or forest restoration works. Mulch containing weed propagation material (e.g. seeds) must be heap composted to ensure this material is rendered unviable.

6.14 Vehicle Access. Vehicles are not permitted within the restoration zones. All work is to be carried out by hand within this zone. Vehicle access to the revegetation zones is permitted, but only for management activities.

7.0 Maintenance

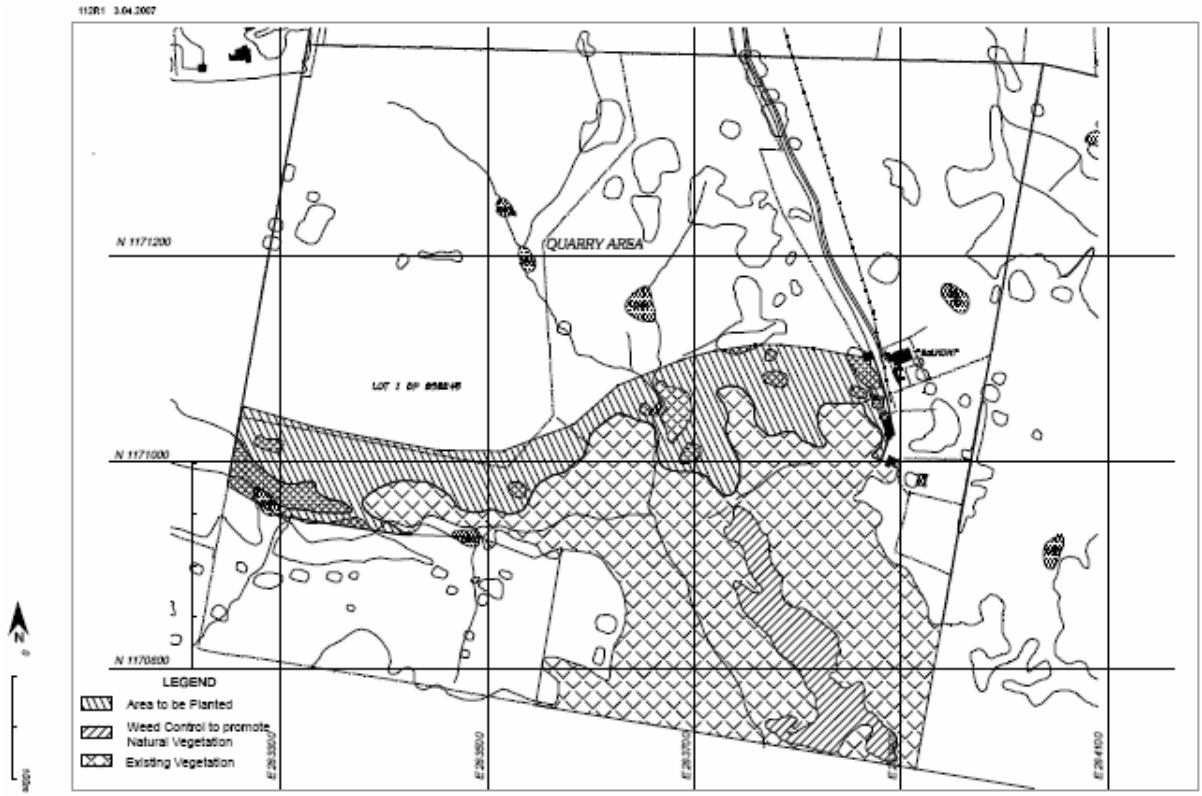
7.1 At all times the responsible officer is responsible for the success of the restoration and revegetation works. The officer will ensure that the plantings, weed removal and other necessary actions are undertaken in an environmentally sensitive, efficient and timely manner.

7.2 The following maintenance activities will be undertaken as regular intervals.

- check that the fencing is intact;
- carry out weed control;
- water plants as required;
- replace dead plants;
- remove rubbish (e.g. litter blown onto site);
- treat erosion should this occur; and
- address the impact of grazing animals, if required.

8.0 Environmental monitoring and reporting program

8.1 During the construction period, a qualified ecologist is to inspect the area and prepare a written report on the effectiveness of the environmental management actions, once every six months. The report to be included in the annual Environmental Management Report will cover matters such as compliance with this management plan and any adverse environmental impacts, any recommendations and any additional mitigation measures considered necessary. The responsible officer is responsible for the engagement of the ecologist.



PART 3. SITE AND NATURAL RESOURCE INFORMATION

3 SITE DESCRIPTION

3.1 LOCATION AND CHARACTER OF THE SITE

The Albion Park Quarry land is known as Lot 1 DP 858245 at Albion Park in the City of Shellharbour. The land has a total area of 40 hectares and is about 400 metres from the southern and south-eastern boundaries of Cleary Bros' existing Albion Park quarry operations. The proposed quarry does not cover the whole of this land. A separate Vegetation Management Plan has been prepared for the quarry access road (Kevin Mills & Associates 2007).

The proposed area for the quarry is mostly cleared, although large areas of native vegetation, mainly rainforest, are still present on other parts of the properties. Most of the bushland occurs on the steep slopes and along gullies, while the gentler slopes and flat land have been almost totally cleared and are used for grazing purposes.

Farming and quarrying are the main land uses in the vicinity of the study area. There has been a long history of farming at Albion Park, dating from 1817 when the first land grants were made. There are several quarries in the area, and the hard rock quarry operated by Cleary Bros. (Bombo) Pty Limited has been operating for about 35 years.

The study area is located on a ridge system composed of the Permian Gerringong Volcanics, a unit of which, the Bombo Latite, is the objective of the proposed quarry. It receives an estimated rainfall of approximately 1,120 mm per year. The altitude of the study area ranges from about 70 metres to 130 metres.

3.2 EXISTING VEGETATION AND HABITATS

Quarry Site

The vegetation on the quarry site is largely non-native (introduced) grassland, used for many years for the grazing of stock. The only significant vegetation on the site are small patches of rainforest plants. These are described in the Flora and Fauna Report in the EIS (Kevin Mills & Associates 2003). The following description is taken from that report:

"1. Subtropical Rainforest (Closed Forest)
Structure: The height of the trees and shrubs varies from 5 to 35 metres, depending on location. Stands of relatively undisturbed closed forest, with continuous closed canopy and mature trees occur along the main creekline and gully to the south of the study area. Stands on hill-slopes generally consist of a few over-mature individuals, surrounded by regrowth native tree species and, often, an outer band of Lantana. Ground cover is absent to sparse, usually consisting of ferns or small soft-wooded perennials. Lianas are plentiful, especially near edges.
Occurrence: Continuous stands occur along two sections of the main creekline, extending from the adjoining quarry, through a gully described by QEM (1994) as the Cody property. Small patches occur on the eastern slopes of quarry site.
Floristics: Mills and Jakeman (1995) describe Subtropical Rainforest Ficus – Planchonella – Baloghia – Streblus as occurring on "...the steep rocky slopes on the latite rock outcrops of the Gerringong Volcanics...". This vegetation type approximates Floyd's (1990) classification of Dry Rainforest Suballiance 23.
Common tree species include Black Plum *Diospyros australis*, Red-fruited Olive Plum *Cassine australis*, Sweet Pittosporum *Pittosporum undulatum*, Whalebone Tree *Streblus brunonianus*, Muttonwood *Rapanea variabilis* on hill slopes and Lilly Pilly *Acmena smithii*, Murrogun *Cryptocarya microneura*, Bolly gum *Litsea reticulata* and Brush Cherry *Syzgium australe* in gullies. Common emergent trees are figs *Ficus* spp. in remnant stands and Red Ash *Alphitonia excelsa* in regrowth stands.
Common weed species along edges and along drainage lines include Lantana *Lantana camara*, Blackberry *Rubus fruticosus*, Mist Flower *Ageratina riparia*, Moth Vine *Araujia sericiflora* and Madeira Vine *Andredera cordifolia*. Common native species of the edges include Native Hibiscus *Hibiscus heterophyllus*, Whalebone Tree *Streblus brunonianus,* Cockspur Thorn *Maclura cochinchinensis*, Tree Violet *Hymenanthera dentata* and Breynia *Breynia oblongifolia*.
Ferns occasionally occur in moist sites, including Climbing Fishbone Fern *Arthropteris tenella*, Giant Maidenhair *Adiantum formosum,* Necklace Fern *Asplenium flabellifolium*, Prickly Rasp Fern *Doodia aspera* and Rock Felt Fern *Pyrrosia rupestris*."

In addition to the removal of these rainforest patches, four large old fig trees would be removed. The small dams on the quarry site support some native wetland plants. The only other vegetation present are patches of Lantana *Lantana camara*.

Vegetation Management Area

This is the area to the south of the quarry site containing the rainforest in the gully and the buffer area between it and the proposed quarry. The vegetation consists of intact rainforest, a dense Lantana fringe and the exotic grassland in

the buffer area. The rainforest is similar to that described above for the quarry site, although more diverse and in better condition. The stands of Lantana contain many rainforest species. In the east, near the side gully, there is a small stand of eucalypt woodland. A full description of this vegetation is provided in the Environmental Impact Statement.

3.3 CONSERVATION VALUES

3.3.1 Threatened and Regionally Significant Plants

Several plant species of conservation importance were found in the study area and nearby during this and previous studies in the area. These species are listed in Table 1.

Table 1
Plant Species of Conservation Importance

Endangered or Vulnerable Plant Species		
Cynanchum elegans	White Cynanchum	Vine
Daphnandra sp. 'C' (Illawarra)	Illawarra Socketwood	Tree
Zieria granulata	Illawarra Zieria	Shrub
Regionally Significant Plant Species		
Actephila lindleyi	Actephila	Shrub/small tree
Alchornea ilicifolia	Native Holly	Shrub
Austromyrtus acmenoides	Scrub Ironwood	Small tree
Canthium coprosmoides	Coast Canthium	Small tree
Cinnamomum oliveri	Oliver's Sassafras	Tree
Deeringia amaranthoides	Deeringia	Shrub
Dodonaea viscosa subsp. *augustifolia*	Hopbush	Shrub
Geijera latifolia	Brush Wilga	Tree
Omalanthus stillingifolius	Small Bleeding Heart	Shrub

Endangered or Vulnerable Plant Species
Three plant species that occur in the study area are classified by the Briggs and Leigh (1996) as having national conservation significance; all three are threatened species in New South Wales (*Threatened Species Conservation Act 1995*). These species are all endangered: *Cynanchum elegans*, *Daphnandra* sp 'C' (Illawarra) and *Zieria granulata*,.

Cynanchum elegans
Status: This species is listed as endangered. The species has a relatively small geographic range and occurs only in small populations that are mainly restricted to highly specific and localised habitats. Protected areas where this species occurs include Goulburn River National Park (Matthes & Nash 1993), Woko National Park

and Camels Hump Nature Reserve (Briggs & Leigh 1996). Harden (1992) states that the species is rare, recorded from rainforest gullies, scrub and scree slopes from the Gloucester district to the Wollongong area and inland to Mt Dangar. Recent local recordings of this species include creeklines in Farmborough Heights and in the Keira Green Corridor. Individuals have also been recorded in small remnant stands at Cobbitty and Fairfield (NPWS 1997). In all cases only one individual or a very small population has been recorded.

A recovery plan for this species includes the following observations (Matthes & Nash 1993):
"None of the populations recorded in the Illawarra are protected and all are under some degree of immediate threat. If these threats are successful then *C. elegans* may become extinct in the Illawarra within ten years. At this stage, until we understand more about the population dynamics of *C. elegans* every individual must be considered important for the long term survival of the species.

Populations in the Study Area: Fourteen specimens of *Cynanchum elegans* were recorded by QEM (1994) on the Rinker land in the area adjoining the present study area. Of these individuals recorded, two occur within the study area of this report. Three specimens were recorded on the "Cody gallery rainforest". No further disturbance has taken place in this area, so these plants are expected to still be present.

Daphnandra sp. 'C' (Illawarra)
Illawarra Socketwood is the only tree species that is endemic to the Illawarra rainforests (Fuller & Mills 1985), and is listed as endangered. This species is a small tree and is described by Harden (1990) as a very rare small tree, confined to the Illawarra area. Small populations or individuals have been recorded between Scarborough and Berry, generally in closed forest. Distribution appears to be restricted to sites below 200 metres above sea level. Most recorded populations of this species appear to be ramets (clones) from a single individual and in most cases sexual reproduction does not appear to be taking place.

Harden (1990) describes the globose shape of the fruiting receptacle as a distinguishing feature. It is possible that this globose fruiting body is a false fruit, as the globose fruiting bodies do not appear to contain seeds.

Mills and Jakeman (1995) have proposed that this species have a conservation rating of 2VCi, and observe that the only known conservation area in which the species occurs is in Budderoo National Park, in the gorge at Minnamurra Falls. This species occurs in the gorge to the south of the quarry development area, well within the rainforest remnant.

Zieria granulata

Status: This species is endangered. The code indicates that the species has a geographic range of less than 100 kilometres, is not presently endangered but is at risk from disappearing from the wild over the next 20-50 years and is reserved, but not adequately, in Budderoo National Park and in Killalea State Recreation Area. This species is listed as vulnerable in a national context in Part 2 Schedule 1 of the TSC Act (1995). Mills and Jakeman (1993) describe the distribution of *Zieria granulata* as extending from Broughton Village to Albion Park. The Dunmore area accounts for an estimated 80% of the total known population and the stands occurring in the study area occur near the northern limit of distribution for this species. A small stand occurring on fill material at Kanahooka is not considered to be naturally occurring (Mills & Jakeman 1993).

Populations in the Study Area: The largest populations of this species were recorded along the western and eastern edges of the shrubland on Belmont Ridge. Small populations or scattered individuals were also recorded within the shrubland, and along the closed forest edge to the south and downslope of the farm buildings on Belmont Ridge. Three large individuals were recorded on the northern edge of the "Cody gallery rainforest" (QEM 1994). Seedlings were recorded in the population occurring near a farm dam on the western edge of the shrubland stand. No seedlings were recorded within the shrubland stand, although it appears that this area is heavily grazed, so it is possible that emergent seedlings are regularly eaten. The larger populations contain from 30 to 200 individuals. The total number of individuals occurring in and along the shrubland stand would exceed 1000.

Regionally Significant Plant Species

Nine plant species listed as regionally rare by Mills (1988) and Mills and Jakeman (1995) were recorded in the study area during this and previous studies; see Table 1. The status and location of the species of regional conservation significance are discussed below.

Three of these species have been classified "Category 1" by Mills (1988): *Actephila lindleyi*, *Austromyrtus acmenoides* and *Deeringia amaranthoides*. By the use of the term, "Category 1", Mills (1988) refers to species that are very rare in the Illawarra (<10 known occurrences) and in need of particular conservation and consideration in conservation planning and environmental impact assessment.

Actephila lindleyi is considered to be very rare in southern New South Wales, and usually occurs as a single specimen in subtropical rainforest (Mills 1988). This species was recorded by QEM (1994) in the "Cody gallery rainforest". It is not found in the area of the proposed quarry.

A small population of *Austromyrtus acmenoides* was recorded in the closed forest below the adjoining quarry, and an additional specimen was recorded near the northern extent of the "Cody gallery rainforest". This species occurs no further south than Jamberoo (Mills 1988, 1989) and is rare in the Illawarra. Harden (1991) describes the distribution of this species as … common north of the Hunter Valley, and … as far south as the Illawarra region". This species was not found in the area of the proposed quarry.

Deeringia amaranthoides occurs in subtropical rainforest and is listed as being conserved in Royal National Park, Morton National Park and Devils Glen Nature Reserve. Mills (1988) considers that this species is rare in the region "… and possibly also in the State". This species was recorded near the creekline in the closed forest following the major creekline below the adjoining quarry. This species was not found in the area of the proposed quarry.

Four species recorded during the survey have been classified as "Category 2" by Mills (1988). "Category 2" refers to species that are rare in the region but generally better conserved and/or abundant than Category 1 species.

Alchornea ilicifolia occurs on the margins of rainforest remnants, particularly on volcanic hills between Berkeley and Kiama. The only conservation area where this species is recorded is Killalea State Park (Mills 1988). Specimens of *Alchornea ilicifolia* occur along the edges of the shrubland on Belmont Ridge, as well as along the edges of sections of closed forest, including the vegetation immediately downslope of the adjoining quarry and remnant patches on Belmont Ridge and Kyawana Ridge. A few specimens of *Alchornea ilicifolia* occur within the proposed quarry area.

Canthium coprosmoides occurs throughout the Illawarra in subtropical rainforest but "… is nowhere a common tree …" (Fuller & Mills 1985). Individuals of this species were recorded in the closed forest in the main creekline and in the gully at the south-eastern end of the study area. This species was not found in the area of the proposed quarry.

Cinnamomum oliveri occurs at its southern limit in the Jamberoo area (Fuller & Mills 1985) and prefers high rainfall areas, particularly on the escarpment. This species was recorded at several sites in the closed forest along the main creekline, as well as in the closed forest band on Belmont Ridge. This species was not found in the area of the proposed quarry.

Geijera latifolia is an occasional occurrence in several small remnant rainforest patches, as well as along rainforest stands occurring on south-facing hill-slopes. This species is conserved in Macquarie Pass National Park and Mount Brown

Reserve. Local occurrences are generally restricted to "… drier areas of rainforest, nearly always on volcanic soils" (Mills 1988). A few specimens of *Geijera latifolia* were found in the proposed quarry area.

Dodonaea viscosa subsp. *augustifolia* is a shrub species found in dry ridgetop communities, usually with *Melaleuca armillaris*, in the Dunmore-Jamberoo area, but is otherwise not found in the region. This species occurs in the eastern part of the property, on dry ridges. This species was not found in the area of the proposed quarry.

Omalanthus stillingifolius is a shrub species recorded by QEM (1994) on the margins of the Eastern Ridge (adjoining quarry). This species occurs on rocky sites mainly in coastal areas, but is uncommon in the Illawarra region. No individuals of this species were found in the quarry area.

3.3.2 Threatened Animals

The *Threatened Species Conservation Act 1995* conserves threatened species, populations and ecological communities of animals and plants in New South Wales. Threatened fauna are listed on the schedules attached to the Act and are classified either as "endangered" (Schedule 1 species), "vulnerable" (Schedule 2 species) or "presumed extinct" (Schedule 1, Part 4).

No threatened fauna species were recorded in the study area but several are known to occur in the locality. Threatened fauna species recorded within a five kilometre radius of the study area are listed in Table 2. The table and subsequent discussion do not include threatened fauna species for which there is no suitable habitat in or adjacent to the study area. The study area is within the general distributional range of many species of threatened fauna; the species discussed are the most likely species to be in the area.

Table 2
Threatened Fauna in the Dunmore-Albion Park District

Schedule 1 - Endangered Species	
Litoria aurea	Green and Golden Bell Frog
Schedule 2 - Vulnerable Species	
Botaurus poiciloptilus	Australasian Bittern
Ninox strenua	Powerful Owl
Pteropus poliocephalus	Grey-headed Flying-fox
Ptilinopus regina	Rose-crowned Fruit-Dove
Dasyurus maculatus	Spotted-tailed Quoll

Green and Golden Bell Frog

The closest known occurrence of the Green and Golden Bell Frog is Killalea Lagoon, about five kilometres to the east. The only wetlands in and near the study area are farm dams, and most of them do not contain habitat suitable for this frog. The only dam in the study area with suitable habitat is Dam No. 8, because of the presence of Cumbungi *Typha orientalis*. All records of the Green and Golden Bell Frog in the Illawarra have been on the coastal lowlands, rather than hilly country, so it is unlikely that the Green and Golden Bell Frog would occur in the study area.

Australasian Bittern

The Australasian Bittern has been recorded in the Minnamurra River system, at Dunmore and Jamberoo, at Killalea Lagoon and at Albion Park. There are large areas of suitable habitat at all of these locations, unlike the study area where there is only a small area of Cumbungi *Typha orientalis* on Dam No. 8. If the Australasian Bittern occurs in the study area, visits would be rare and fleeting because so little suitable habitat is present.

Powerful Owl

The Powerful Owl was regularly recorded in rainforest at Bass Point, eight kilometres east of the study area, between 1984 and 1991. The owl has also been recorded at various locations along the Illawarra escarpment. The Powerful Owl may roost in the rainforest in the study area and may forage there if arboreal mammals are present. It is unlikely that the owl would use the small patches of regrowth in the paddocks.

Rose-crowned Fruit-Dove

The Rose-crowned Fruit-Dove inhabits rainforest and was observed regularly at Bass Point between 1984 and 1989. Immatures seen in 1985 and 1989 may indicate local breeding. The species was last seen in the district in 1995 at Mount Keira. The Rose-crowned Fruit-Dove may occur in the rainforests in the study area.

Spotted-tailed Quoll

There are many old records of the Spotted-tailed Quoll in the district (Robinson 1988), but few recent records from the Shellharbour area. Most recent records are from the forests along the escarpment south of Barren Grounds.

Grey-headed Flying-fox

The Grey-headed Flying-fox has recently been added to the list of threatened species in New South Wales. This species is relatively common in the Illawarra region during summer, when it makes nightly visits to gardens, orchards and isolated fruit trees to feed on fruiting trees. There is a known daytime roosting camp site at Flying Fox Gully, north of Jamberoo, about four kilometres to the south of the present study area.

Microchiropteran Bats

Several threatened bat species have been recorded in the district, including the Greater Broad-nosed Bat *Scoteanax rueppellii* (Tallawarra 1997), Large-footed Myotis *Myotis adversus* (Tallawarra 1997), Common Bentwing-Bat *Miniopterus schreibersii* (Kiama 1966) and Yellow-bellied Sheathtail Bat *Saccolaimus flaviventris*. Apparently no bat surveys have been undertaken in the vicinity of the study area. Bats would certainly occur in the general area, because of the presence of ample foraging habitat, large trees with hollows for roosting and other resources for bats; these are mainly in the valley to the south of the quarry site.

3.3.3 Endangered Ecological Communities

Three ecological communities in the area are listed as endangered under the *Threatened Species Conservation Act 1995*; these are discussed below. The proposed quarry will not affect the tall paperbark Shrubland; this community occurs on the far eastern par of the property, well away from the quarry extension area.

Subtropical Rainforest

If the stands of rainforest are typical of the classifications described by Floyd (1990) and Mills and Jakeman (1995), their conservation status may be discussed in the national and regional context: Dry Rainforest Suballiance 23 is considered to be inadequately conserved in the national context and is "…not reserved in the south" (Floyd 1990). Mills and Jakeman (1995) observed that 55% of the land on which rainforest occurs in the Illawarra is privately owned, and that in the case of subtropical rainforest only 9.4% of the total remaining area occurs in a reserved area, i.e. Killalea State Recreation Area. "The greatest threat to the district's rainforest is the gradual loss and degradation, through a myriad of unsympathetic land uses associated with the rural and semi-urban environment in which the rainforest occurs" (Mills & Jakeman 1995).

Illawarra Lowlands Grassy Woodland

This community has been listed as an endangered ecological community under the *Threatened Species Conservation Act 1995*; see Appendix 2. The stand of eucalypts in the study area was surveyed to determine its structural and floristic characteristics and to determine if it met the criteria of the Illawarra Lowlands Grassy Woodland community, as documented in the Final Determination.

This stand of eucalypts is dominated by Forest Red Gum *Eucalyptus tereticornis* and Coast White Box *Eucalyptus quadrangulata*. The understorey is a mixture of rainforest species, typical native grassland species and weeds. This type of forest was termed Moist Red Gum Forest by Kevin Mills & Associates (1997), and is at the

"moist end" of the complex of communities known as Illawarra Lowlands Grassy Woodland. The rainforest species present include Cockspur Thorn *Maclura cochinchinensis*, Native Olive *Notelaea longifolia*, Black Plum *Diospyros australis*, Whalebone Tree *Streblus brunonianus*, Guioa *Guioa semiglauca*, Native Quince and *Alectryon subcinereus*. The native grassland species present include Bergalia Tussock *Carex longebrachiata*, Kidney-weed *Dichondra repens*, Crane's-bill *Geranium* sp., Twining Glycine *Glycine clandestina, A*ustralian Basket-grass *Oplismenus aemulus* and Love-grass *Eragrostis* sp. The weed species are Kikuyu Grass *Pennisetum clandestinum*, Olive *Olea europaea*, Lantana *Lantana camara*, Spear Thistle *Cirsium vulgare*, Ribbed Plantain *Plantago lanceolata*, Fleabane *Conyza* sp. and Fireweed *Senecio madagascariensis*.

Tall Paperbark Shrubland

The shrubland at the eastern end of the property but outside the area of the proposed quarry, may appear unattractive and apparently dominated by Black Wattle, but within the stands are remnant patches of *Melaleuca* shrubland, a characteristic vegetation type on exposed ridgetop sites where soils are thin and rock outcrops are common (Fuller & Mills 1985). This community is a significant visual feature of the Dunmore-Jamberoo area and provides habitat for several large populations of the nationally endangered plant species *Zieria granulata*.

PART 4. MANAGEMENT

4 MANAGEMENT OBJECTIVES

The following key management objectives have been identified:

(i) Ensure that the development of the quarry, haul road and associated works do not impact upon the existing stands of native vegetation outside the quarry area.

(ii) Successfully rehabilitate and expand the existing areas of Illawarra Subtropical Rainforest and Illawarra Lowlands Grassy Woodland on the identified land adjoining the quarry.

(iii) Successfully control problem weeds in the area, particularly noxious weeds and weeds that are impacting significantly upon the native vegetation and rehabilitation efforts.

(iv) Implement other measures to ensure the success of the restoration and revegetation of the identified land.

5 MANAGEMENT ISSUES

5.1 Management Zones

Within the identified land two types of zones are recognised. These are restoration zones and a revegetation zones. The restoration zones cover stands of existing vegetation. The primary management task in this zone is the removal of weeds and the encouragement of native plant regeneration that is already occurring. The revegetation zone is currently cleared and grassed, mainly with exotic species, and contains little native regeneration. In this zone, the primary task is to replant appropriate local native species and control weed growth. The management zones can be summarised in the following way.

Restoration Zone – Rainforest
This zone includes the existing rainforest vegetation that with weeding and minor planting will regenerate naturally over time. The aim in this zone is to enhance the natural process of rainforest regeneration.

Restoration Zone - Woodland
This zone includes the existing woodland vegetation that with weeding and minor planting will regenerate naturally over time. The aim in this zone is to enhance the natural process of woodland regeneration.

Revegetation Zone – Rainforest
This zone incorporates the cleared and treeless areas that originally would have supported rainforest and where there is almost no native vegetation or natural regeneration. The aim in this zone is to revegetate the area with native rainforest species.

Revegetation Zone – Woodland
This zone incorporates the cleared and treeless areas that originally would have supported woodland and where there is almost no native vegetation or natural regeneration. The aim in this zone is to revegetate the area with native woodland species.

Access Road Route
The report by Kevin Mills & Associates (2007) should be read in conjunction with this report in terms of the access road.

5.2 Protection of Existing Vegetation and Habitats

Pre-Clearing Surveys

The vegetation to be cleared is described in detail in the Flora and Fauna Report and this is reproduced above. It is proposed to carry out pre-clearing vegetation surveys just prior to the clearing of any rainforest vegetation. The purpose of these additional surveys is to:

- identify any plant material (seeds, rootstock, cuttings) that would be useful to gather for use in propagating plants for the revegetation program elsewhere on the quarry site;
- identify any material on the site (logs, natural mulch, rocks, soil) that could be used for revegetating the buffer areas south of the quarry site;
- identify any important plants that may have colonised the site since the 2003 surveys (note that the final stage of the quarry is about 26 years in the future); and
- describe the fauna observed and any special habitat features, such as tree hollows.

Prior to the clearing of rainforest vegetation, an ecologist will inspect the vegetation and prepare a report dealing with, as a minimum, the above matters for inclusion in the annual EMR.

Fencing

The primary measure to ensure that the existing vegetation is maintained is the erection of fencing along the designated boundary of the identified area. The fence will be constructed prior to any quarry development work being commenced in the vicinity of the boundary to be fenced.

5.3 Treatment of Restoration Areas

As noted above, the aim of management within this zone is to enhance the natural processes of rainforest regeneration. This will largely be achieved through weed removal. Natural regeneration is likely to be prolific in these areas with the removal of stock and the main weeds in the area. There may be some minor planting of native species as decided after weed removal has been undertaken.

5.4 Planting Revegetation Areas

Collecting Propagation Material

The availability of plant propagation material will be identified during the pre-clearing surveys discussed above. Propagation material includes:

- seeds, these can be collected and stored for later use;
- cuttings, many species can be propagated this way;

- rootstock, some species can be readily transplanted by using their rootstock;
- whole plants, useful in some circumstances, such as seedlings of rare species and wetland plants.

The propagation material collected during the pre-clearing inspections will be provided to a specialist nursery for propagating the plants required for the planting programs. If constructed ponds require vegetating, appropriate wetland plants on existing dams will be identified by the ecologist for transplanting.

Reuse of Cleared Material

Material removed from some areas, particularly from within the small rainforest patches, may be useful in the revegetation areas, to assist in revegetation or for creating habitat. This material will be identified during the pre-clearing surveys, and may include top soil, logs, surface rocks and mulch.

Treatment of Topsoil

The "topsoil" is a valuable resource for revegetation and restoration of habitats. The soil below native vegetation often contains propagules (seeds, rootstock) useful for revegetation areas.

"Topsoil" stripped from each stage and identified for use in revegetation or on bund walls will be used as soon as possible. Preferably, it would be taken and spread immediately after stripping to the end use area, rather than being stored in a stockpile for a long period of time.

Plant Selection

Plant species to be used in the revegetation areas must be locally occurring species and obtained from local stock. These species can be selected from the list of species that occur in the area, provided at Appendix 1.

A full range of species will be used, from trees to ground covers. Maximum use will be made of the existing plants growing in the revegetation area. When weeds are removed, for example, care will be taken to ensure that active species growing amongst the weeds will be kept. This strategy will greatly accelerate the regeneration of the forest in the area and reduce the need for planting in some areas.

Planting Techniques

Tubestock is to be used for all plantings. Plantings of trees and shrubs will be at an average of two (2) metre centres. Plantings to be in a random pattern and planting in straight lines to be avoided. Once planted the plants should be watered. Plastic tree guards should be placed around all tubestock planting and supported by three hardwood stakes. Follow-up watering once a week may be required, depending upon

local weather conditions. A circle around each planting to be sprayed with an approved herbicide to suppress weeds.

5.5 Weed Control

The most important weeds on the quarry site are listed below, in Table 3. Note that there are many exotic (introduced) plants on the plant species list for the site, but most are not regarded as being significant weeds. The most important weeds are declared noxious within the City of Shellharbour under the *Noxious Weeds Act 1993*. Other weeds, termed environmental weeds, may also become important within the restoration and revegetation areas.

Table 3
List of Important Weed Species in the Quarry Area

Species	Habit	Status/Notes
Noxious Weeds		
African Box-thorn *Lycium ferocissimum*	Shrub	Noxious (W2). Rare on the site.
Blackberry *Rubus fruticosus*	Scrambling shrub	Noxious (W2). Scattered small patches.
Prickly Pear *Opuntia stricta*	Succulent herb	Noxious (W4). Rare on the site.
Environmental Weeds		
Castor Oil Plant *Ricinus communis*	Large herb	Mostly on disturbed ground; can form large colonies if not treated. Occasional on the site.
Crofton Weed *Ageratina adenophora*	Large herb	Significant weed of moist places.
Lantana *Lantana camara*	Scrambling shrub	Rampant invasive species, forms large thickets if left unchecked. Common on the site.
Large-leaved Privet *Ligustrum lucidum*	Small tree	Occasional in treed areas.
Madeira Vine *Anredera cordifolia*	Vine	Occasional to common amongst Lantana.
Mist Flower *Ageratina riparia*	Shrub	Common in moist areas.

Moth Vine *Araujia sericiflora*	Vine	Common amongst Lantana.
Noogoora Burr *Xanthium occidentale*	Large herb	Mainly on disturbed areas.
Small-leaved Privet *Ligustrum sinense*	Shrub, small tree	Occasional in treed areas.

The company will appoint a staff member to be responsible for monitoring the presence and abundance of weeds on the site. The responsible person will undertake an inspection of the subject land prior to clearing and develop a weed control strategy for implementation during the clearing operations. This will be aimed at destroying weeds and ensuring that they are not spread while transporting soil.

5.6 Maintenance

Maintenance of the restoration areas and planted vegetation will be guided by weekly site inspections undertaken by the responsible staff member. The proposed six-monthly monitoring inspections by the ecologist will also provide information for the successful maintenance of these areas.

Day to day maintenance will involve checking the following:
- condition of the plantings;
- condition of the planting bag and stakes;
- the need for weed control;
- the impact of feral animals;
- the need for follow up planting or watering;
- the condition of fences;
- general condition of the restoration and planting areas.

5.7 Pest Animal Species

Feral animals that may require control measures are Rabbits and Hares. These species are likely to be present and their impact on native plant regeneration will need to be monitored to determine if control measures are required.

5.8 Release of Water from the Dam

The release of water from the quarry dam should be variable; that is, rather than a continuous flow, water release should mirror the local rainfall events as far as possible.

6 REFERENCES

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APPENDIX 1
LIST OF PLANT SPECIES FOR THE ALBION PARK QUARRY SITE

Key to Plant List

1. Recorded by QEM (1994). Additional species recorded by Kevin Mils & Associates.
2. closed forest
3. open forest
4. grassland
5. shrubland/regrowth
6. sedgeland/rushland (dams)

c - common
o - occasional
u - uncommon
- plant species of conservation importance.

***** - Introduced plants.

FAMILY	GENUS SPECIES	*	1	2	3	4	5	6
FILICOPSIDA								
Adiantaceae	*Adiantum aethiopicum*		x	u				
	Adiantum formosum		x	u				
	Adiantum hispidulum		x	u	u			
	Cheilanthes distans		x					
	Cheilanthes sieberi		x		u	u	u	
Aspidiaceae	*Asplenium australasicum*		x	u				
	Asplenium flabellifolium		x	o	u			
	Lastreopsis acuminata		x	u				
	Lastreopsis microsora		x	u				
Azollaceae	*Azolla filiculoides*						o	
Blechnaceae	*Blechnum cartilagineum*		x	u				
	Doodia aspera		x		u		u	
Davalliaceae	*Arthropteris tenella*		x	o				
Dennstaedtiaceae	*Histiopteris incisa*			o				
	Hypolepis muelleri			u				
	Hypolepis glandulifera			u				
	Pteridium esculentum			o				
Dicksoniaceae	*Calochlaena dubia*		x			u		
Polypodiaceae	*Microsorium scandens*		x		u			
	Platycerium bifurcatum subsp. *bifurcatum*		x	u	u			
	Pyrrosia rupestris		x	o	u			
Sinopteridaceae	*Pellaea falcata* var. *falcata*		x	o	u		u	
CONIFEROPSIDA								
Podocarpaceae	*Podocarpus elatus*		x	u				
MAGNOLIOPSIDA - DICOTYLEDONS								
Acanthaceae	*Brunoniella australis*				o		u	
	Pseuderanthemum variabile		x	u	u			
Amaranthaceae	*Alternanthera denticulata*		x		u			u

	Amaranthus retroflexus	*	x			u		
	Deeringia amaranthoides	#	x	u				
	Nyssanthes erecta		x			u		
Amygdalaceae	*Prunus persica*	*					u	
Anacardiaceae	*Euroschinus falcata*		x	u				
Apiaceae	*Centella asiatica*				o		o	
	Hydrocotyle peduncularis		x					
	Hydrocotyle tripartita				u			
	Platysace ericoides		x					
Apocynaceae	*Parsonsia straminea*		x	c	o			
Araliaceae	*Polyscias elegans*		x	o				
Asclepiadaceae	*Araujia sericiflora*	*		o	o		o	
	Cynanchum elegans	#	x	u			u	
	Gomphocarpus fruticosus	*	x			u		
	Marsdenia flavescens		x	c				
	Marsdenia rostrata		x	o				
	Melodinus australis		x	u				
	Tylophora barbata		x		o		u	
Asteraceae	*Ageratina adenophora*	*	x	o				o
	Ageratina riparia	*	x	o	o			
	Bidens pilosa	*	x			o		
	Brachycome angustifolia var angustifolia		x					
	Cassinia trinervia		x		u		u	
	Cirsium vulgare	*	x			o		
	Conyza albida	*	x		o	o	o	
	Conyza bonariensis	*	x				o	
	Delairea odorata	*	x	u			u	
	Euchiton sphaericum					u		
	Hypochaeris radicata	*	x			o		
	Ozothamnus diosmifolius		x		o		o	
	Senecio linearifolius			u	u			
	Senecio madagascariensis	*	x			c	o	
	Sonchus oleraceus	*	x			o		
	Tagetes minuta	*	x					o
	Xanthium occidentale	*	x			u		
Basellaceae	*Anredera cordifolia*	*	x	u			u	
Bignoniaceae	*Pandorea pandorana*		x	c	o		u	
	Tecomaria capensis	*						
Brassicaceae	*Rorippa nasturtium-aqauticum*	*	x					u
Cactaceae	*Opuntia stricta*	*	x			o		
Campanulaceae	*Wahlenbergia gracilis*		x		o	o	u	
Caprifoliaceae	*Lonicera japonica*	*					u	

	Sambucus australasius		x	u			u	
Caryophyllaceae	*Stellaria flaccida*		x	o	u			
Celastraceae	*Elaeodendron australe*		x	c			u	
	Celastrus australis		x	u				
Chenopodiaceae	*Einadia hastata*		x			u		
	Einadia nutans		x			u		
Clusiaceae	*Hypericum gramineum*					o		
Convolvulaceae	*Convolvulus erubescens*		x		u			
	Dichondra repens		x		u	o	u	
	Ipomoea indica	*					u	
Crassulaceae	*Bryophyllum delagoense*	*	x			o	o	
	Cotyledon orbiculata	*	x				u	
	Crassula sieberiana		x		o	u	o	
Cucurbitaceae	*Sicyos australis*		x	u				
Cunoniaceae	*Aphanopetalum resinosum*		x	u				
Dilleniaceae	*Hibbertia dentata*				u			
	Hibbertia scandens		x		u			
Ebenaceae	*Diospyros australis*		x	u				
	Diospyros pentamera		x	o				
Ehretiaceae	*Ehretia acuminata*		x	o			u	
Elaeocarpaceae	*Elaeocarpus kirtonii*		x	u				
	Sloanea australis		x	u				
Epacridaceae	*Leucopogon juniperinus*		x		u			
	Lissanthe strigosa						o	
Euphorbiaceae	*Actephila lindleyi*	#	x	u				
	Alchornea ilicifolia	#	x	o			o	
	Baloghia inophylla		x	o				
	Breynia oblongifolia		x	u	o		o	
	Claoxylon australe		x	u				
	Croton verreauxii		x	o			u	
	Glochidion ferdinandi		x	o				
	Omalanthus populifolius		x	c	o		u	
	Omalanthus stillingifolius	#	x					
	Phyllanthus gasstroemii		x		u			
	Ricinus communis	*	x			u		
Eupomatiaceae	*Eupomatia laurina*		x	u				
Fabaceae: Faboideae	*Desmodium varians*					u		
	Erythrina x sykesii	*				u		
	Glycine clandestina		x		o	o		
	Glycine tabacina					u		
	Hardenbergia violacea					u		
	Indigofera australis		x		u		u	
	Kennedia rubicunda		x			u	u	
	Trifolium repens	*				c		

	Trifolium subterranean	*	x			c		
Fabaceae: Mimosoideae	*Acacia binervata*				o		o	
	Acacia implexa		x		o		u	
	Acacia maidenii		x		u			
	Acacia mearnsii		x		o		c	
	Acacia melanoxylon				u			
	Pararchidendron pruinosum		x	u				
Flacourtiaceae	*Scolopia braunii*		x	u				
Gentianaceae	*Centaurium erythraea*	*	x			o		
Geraniaceae	*Geranium homeanum*		x					
	Geranium solanderi				u			
Goodeniaceae	*Scaevola albida*		x					
Icacinaceae	*Citronella moorei*		x	u				
	Pennantia cunninghamii		x	u				
Lamiaceae	*Ajuga australis*			u				
	Plectranthus graveolens(?)		x					
	Plectranthus parviflorus		x	o	o		o	
	Prostanthera linearis		x				u	
Lauraceae	*Cinnamomum oliveri*	#	x	u				
	Cryptocarya glaucescens		x	u				
	Cryptocarya microneura		x	c			o	
	Litsea reticulata		x	o				
Lobeliaceae	*Pratia purpurascens*				o			
Loranthaceae	*Amyema congener*		x	u			u	
Malaceae	*Pyracantha fortuneana*	*					u	
Malvaceae	*Abutilon oxycarpum*				u			
	Hibiscus heterophyllus		x	c	u		o	
	Modiola caroliniana	*	x			o		
	Sida rhombifolia	*	x			o		
Meliaceae	*Melia azedarach*		x	o			u	
	Synoum glandulosum		x	u				
	Toona ciliata		x	u			u	
Menispermaceae	*Legnephora moorei*		x	u			u	
	Sarcopetalum harveyanum		x	o			u	
	Stephania japonica var. *discolor*		x	u			u	
Monimiaceae	*Daphnandra* sp. aff. *micrantha (species 'C')*	#	x	u				
	Doryphora sassafras		x	u				
	Wilkiea huegeliana		x	u				
Moraceae	*Ficus coronata*		x	o			u	
	Ficus macrophylla		x	o		o		
	Ficus obliqua		x	u				
	Ficus rubignosa		x	u				

	Ficus superba var. *henneana*		x	u		o		
	Maclura cochinchinensis		x	c			o	
	Malaisia scandens		x	o			u	
	Strebulus brunonianus		x	c	o		o	
Myrsinaceae	*Rapanea howittiana*		x	u				
	Rapanea variabilis		x	u				
Myrtaceae	*Acmena smithii*		x	c			u	
	Angophora floribunda		x		u			
	Austromyrtus acmenoides	#	x	u				
	Eucalyptus amplifolia		x					
	Eucalyptus bosistoana		x		o			
	Eucalyptus quadrangulata		x		o			
	Eucalyptus tereticornis		x		c			
	Melaleuca armillaris		x		u		c	
	Melaleuca styphelioides		x		u			
	Syzygium australe		x	o				
Oleaceae	*Ligustrum lucidum*	*					u	
	Ligustrum sinense	*	x			u	u	
	Notolaea longifolia		x		u			
	Notolaea venosa		x	o			u	
	Olea europaea subsp. *africana*	*	x			u	u	
Onagraceae	*Ludwigia peploides* subsp. *montevidensis*	*	x					u
Passifloraceae	*Passiflora herbertiana*		x	u	u		u	
Phytolaccaceae	*Phytolacca octandra*	*	x			u		
Piperaceae	*Piper novae-hollandiae*		x	u				
Pittosporaceae	*Billardiera scandens*				u			
	Bursaria spinosa		x				o	
	Citriobatus pauciflorus		x	c			o	
	Pittosporum revolutum		x	o			u	
	Pittosporum undulatum		x	o	o		o	
Plantaginaceae	*Plantago lanceolata*	*	x			o		
	Plantago major	*	x					o
Polygonaceae	*Acetosella vulgaris*	*	x				u	
	Muehlenbergia gracillima		x	u				
	Persicaria decipens		x					u
	Persicaria hydropiper		x					u
	Rumex crispus	*	x					u
Portulacaceae	*Portulaca octandra*	*				o		
Proteaceae	*Stenocarpus salignus*		x	u	u			
Ranunculaceae	*Clematis aristata*				u			
	Clematis glycinoides		x	u			u	
Rhamnaceae	*Alphitonia excelsa*		x	c	o		o	

	Emmenosperma alphitonoides		x	u				
	Pomaderris aspera		x				u	
Rosaceae	*Rubus fruticosus* sp. aggregate	*	x			o	u	
	Rubus hillii		x		u			
	Rubus parviflorus		x		o			
	Rubus rosifolius			u				
Rubiaceae	*Canthium coprosmoides*		x	u				
	Coprosma quadrifida (?)		x					
	Morinda jasminoides		x	u				
	Psychotria loniceroides		x	u				
Rutaceae	*Acronychia oblongifolia*		x	f				
	Citrus limonia	*	x			u		
	Geijera latifolia		x	o			u	
	Melicope micrococca		x	o			u	
	Sarcomelicope simplicifolia		x	u				
	Zieria granulata	#	x				o	
Santalaceae	*Exocarpos cupressiformis*		x		u		u	
Sapindaceae	*Alectryon subcinerus*		x	o			u	
	Cardiospermum grandiflorum	*	x	o	o		o	
	Diploglottis australis		x	o				
	Dodonaea viscosa subsp. *angustifolia*	#	x				o	
	Guioa semiglauca		x	o			u	
Sapotaceae	*Pouteria australe*		x	o			u	
Scrophulariaceae	*Verbascum thapsus*	*	x			o		
	Veronica plebeia				u			
Solanaceae	*Duboisia myoporoides*			u				
	Lycium ferocissimum	*					o	
	Solanum aviculare				u			
	Solanum brownii(?)		x					
	Solanum mauritianum	*	x		u		u	
	Solanum nigrum	*	x			u		
	Solanum pseudocapsicum	*	x			u		
	Solanum stelligerum		x			u		
Sterculiaceae	*Brachychiton acerifolius*		x		u		u	
	Commersonia fraseri		x	o			o	
Ulmaceae	*Trema tomentosa* var. *viridis*		x	o			o	
Urticaceae	*Dendrocnide excelsa*		x	o				
	Urtica incisa		x	u			u	
Verbenaceae	*Clerodendrum tomentosum*		x	o	u		u	
	Lantana camara	*	x	c	c		c	
	Verbena bonariensis	*	x			o		

Violaceae	*Hymenanthera dentata*		x	o			u	
	Viola hederacea		x		u		u	
Vitaceae	*Cayratia clematidea*		x	u				
	Cissus antarctica		x	u				
	Cissus hypoglauca		x	o			u	
MONOCOTYLEDONS								
Alismataceae	*Alizma plantago-aquatica*							u
Araceae	*Gymnostachys anceps*		x	u				
Arecaceae	*Livistonia australis*		x	o				
Commelinaceae	*Aneilema acuminatum*		x	o				
	Commelina cyanea		x	o				
	Pollia crispata		x	u				
Cyperaceae	*Bolboschoenus caldwelli*		x					u
	Carex appressa		x			u		
	Carex longebrachiata		x		u	u	u	
	Cyperus eragrostis	*						u
	Cyperus imbecillis				u			
	Cyperus polystachyos		x					u
	Eleocharis sphacelata		x					u
	Isolepis prolifera	*					c	
Iridaceae	*Romulea longifolia*	*	x			o		
Juncaceae	*Juncus usitatus*		x					o
Lemnaceae	*Spirodela oligorrhiza*		x					o
Philesiaceae	*Eustrephus latifolius*		x	o	o			
	Geitonoplesium cymosum		x	o	o			
Poaceae	*Andropogon virginicus*	*	x			o		
	Aristida ramosa		x		o	o		
	Aristida vagans				o			
	Axonopus affinis	*	x			o		
	Bothriochloa macra		x		u			
	Chloris gayana	*	x			o		
	Chloris truncata		x		u			
	Cynodon dactylon		x		o	u	u	
	Danthonia tenuior				o			
	Echinopogon caespitosus		x		o	o		
	Microlaena stipoides		x		u			
	Oplismenus aemulus			c	c			
	Oplismenus imbecillis		x	c	c		u	
	Paspalum dilatatum	*	x			c	u	
	Paspalum distichum		x					u
	Pennisetum clandestinum	*	x		o	c		o
	Poa labillardieri		x		o	o		
	Sporobolus indicus var. *capensis*	*	x			u		

	Stenotraphrum secundatum	*	x			u		
	Stipa ramosissima		x		o		u	
	Themeda australis		x		o		o	
Orchidaceae	*Dendrobium speciosum*		x					
	Pterostylis hildae(?)		x					
Potamogetonaceae	*Potamogeton crispus*		x					u
Smilacaceae	*Smilax australis*		x	c			u	
Typhaceae	*Typha domingensis*		x					
	Typha orientalis		x					u

APPENDIX 2
LIST OF ANIMAL SPECIES FOR THE ALBION PARK QUARRY SITE

Mammals

Swamp Wallaby	*Wallabia bicolor*
Fox*	*Vulpes vulpes*
Rabbit*	*Oryctolagus cuniculus*
Domestic Cattle*	*Bos taurus*

Birds

Australian Magpie	*Gymnorhina tibicen*
Australian Raven	*Corvus coronoides*
Australian Wood Duck	*Chenonetta jubata*
Bar-shouldered Dove	*Geopelia humeralis*
Black-shouldered Kite	*Elanus axillaris*
Brown Gerygone	*Gerygone mouki*
Brown Thornbill	*Acanthiza pusilla*
Chestnut Teal	*Anas castanea*
Clamorous Reed-Warbler	*Acrocephalus stentoreus*
Common Mynah*	*Acridotheres tristis*
Common Starling*	*Sturnus vulgaris*
Crimson Rosella	*Platycercus elegans*
Eastern Rosella	*Platycercus eximius*
Eastern Spinebill	*Acanthorhynchus tenuirostris*
Eastern Whipbird	*Psophodes olivaceus*
European Goldfinch*	*Carduelis carduelis*
Fan-tailed Cuckoo	*Cacomantis flabelliformis*
Green Catbird	*Ailuroedus crassirostris*
Grey Butcherbird	*Cracticus torquatus*
Grey Fantail	*Rhipidura fuliginosa*
Grey Shrike-thrush	*Collurincincla harmonica*
House Sparrow*	*Passer domesticus*
Latham's Snipe	*Gallinago hardwickii*
Laughing Kookaburra	*Dacelo novaeguineae*
Lewin's Honeyeater	*Meliphaga lewinii*
Little Eagle	*Hieraaetus morphnoides*
Magpie-lark	*Grallina cyanoleuca*
Masked Lapwing	*Vanellus miles*
Mistletoebird	*Dicaeum hirundinaceum*
Nankeen Kestrel	*Falco cenchroides*
Noisy Friarbird	*Philemon corniculatus*
Pacific Black Duck	*Anas superciliosa*
Pied Currawong	*Strepera graculina*
Purple Swamphen	*Porphyrio porphyrio*
Red-browed Finch	*Neochmia temporalis*
Red-whiskered Bulbul*	*Pycnonotus jocosus*

Richard's Pipit	*Anthus novaeseelandiae*
Satin Bowerbird	*Ptilonorhynchus violaceus*
Silvereye	*Zosterops lateralis*
Spotted Turtle-Dove*	*Streptopelia chinensis*
Superb Fairy-wren	*Malurus cyaneus*
Topknot Pigeon	*Lopholaimus antarcticus*
Tree Martin	*Hirundo nigricans*
Welcome Swallow	*Hirundo neoxena*
White-browed Scrubwren	*Sericornis frontalis*
White-faced Heron	*Egretta novaehollandiae*
Willie Wagtail	*Rhipidura leucophrys*
Yellow Thornbill	*Acanthiza nana*
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*
Frogs	
Brown-striped Frog	*Limnodynastes peronii*
Common Eastern Froglet	*Crinia signifera*
Reptiles	
Grass Skink	*Lampropholis guichenoti*
Long-necked Tortoise	*Chelodina longicollis*
Red-bellied Black Snake	*Pseudechis porphyriacus*

* - Introduced species.

Appendix F

REHABILITATION MANAGEMENT PLAN – ACCESS ROAD

REHABILITATION MANAGEMENT PLAN
HARD ROCK QUARRY ACCESS ROAD
Lots 1 & 2 DP 858245, Lot 23 DP 1039967
CLEARY BROS (BOMBO) PTY LTD

1. Purpose

On 10 May 2007 Shellharbour City Council issued development consent to Cleary Bros (Bombo) Pty Ltd to construct a quarry access and haul road (DA 814/2006).

This report is prepared pursuant to condition 34 of the consent that reads as follows:

> *16. Within six months of the date of this consent, the applicant must prepare, and subsequently implement a* Rehabilitation Management Plan *for the site in consultation with Shellharbour City Council. This plan must:*
> *a) identify the disturbed area at the site*
> *b) describe in general the short, medium, and long-term measures that would be implemented to rehabilitate the site (including the decommissioning of the haul road the return to the natural ground levels at the expiration of the quarrying process)*
> *c) describe in detail the measures that would be implemented over the next 5 years to rehabilitate the site, and*
> *d) describe how the performance of these measures would be monitored over time.*

"The site" referred to in the condition is that part of Lot 1 DP 858245, owned by Bridon Pty Ltd (a Cleary Bros company), Lot 2 DP 858245, owned by Rinker Australia Pty Ltd and Lot 23 DP 1039967, owned by Cleary Bros (Bombo) Pty Ltd that is affected by the access road.

2. Identification of Disturbed Area

The access road corridor and footprint are shown on the survey plan (Drawing 106208/90750) attached to this report.

During road construction, all earth works will be confined to within the land designated "extent of batter", shown with a dashed line on the plan. The access road involves cut and fill components. Any surplus excavated material will be used to construct the noise/sight bund at the north eastern corner of the quarry. At the completion of earthworks, the batters will be hydromulched and screen planting will be undertaken at locations shown on the landscape plan for the site.

Repairs will be made to any areas of grassland outside the immediate footprint of the haul road that may have become damaged during construction. This work forms part of access road construction and maintenance and is not the subject of this rehabilitation plan.

3. General measures to rehabilitate the site

The access road will be rehabilitated when it is no longer required to service the quarry project, scheduled to occur some 30 years after commencement. After the road is decommissioned its surface will be ripped and the excavation backfilled to original contours.

A surface layer of suitable topsoil will be placed and grassland re-established over the disturbed area similar to grassland in adjoining paddocks. Erosion and sediment controls will be installed during in this work and will remain in place at least until the surface has fully stabilised.

Haul road rehabilitation will be undertaken at a single point in time and hence is not subject to short, medium or long term measures, other than monitoring and maintenance as referred to below.

4. Detailed rehabilitation measures over the next five years

It is not anticipated that rehabilitation of the haul road will be required during the next five years, as the quarry is a 30-year project.

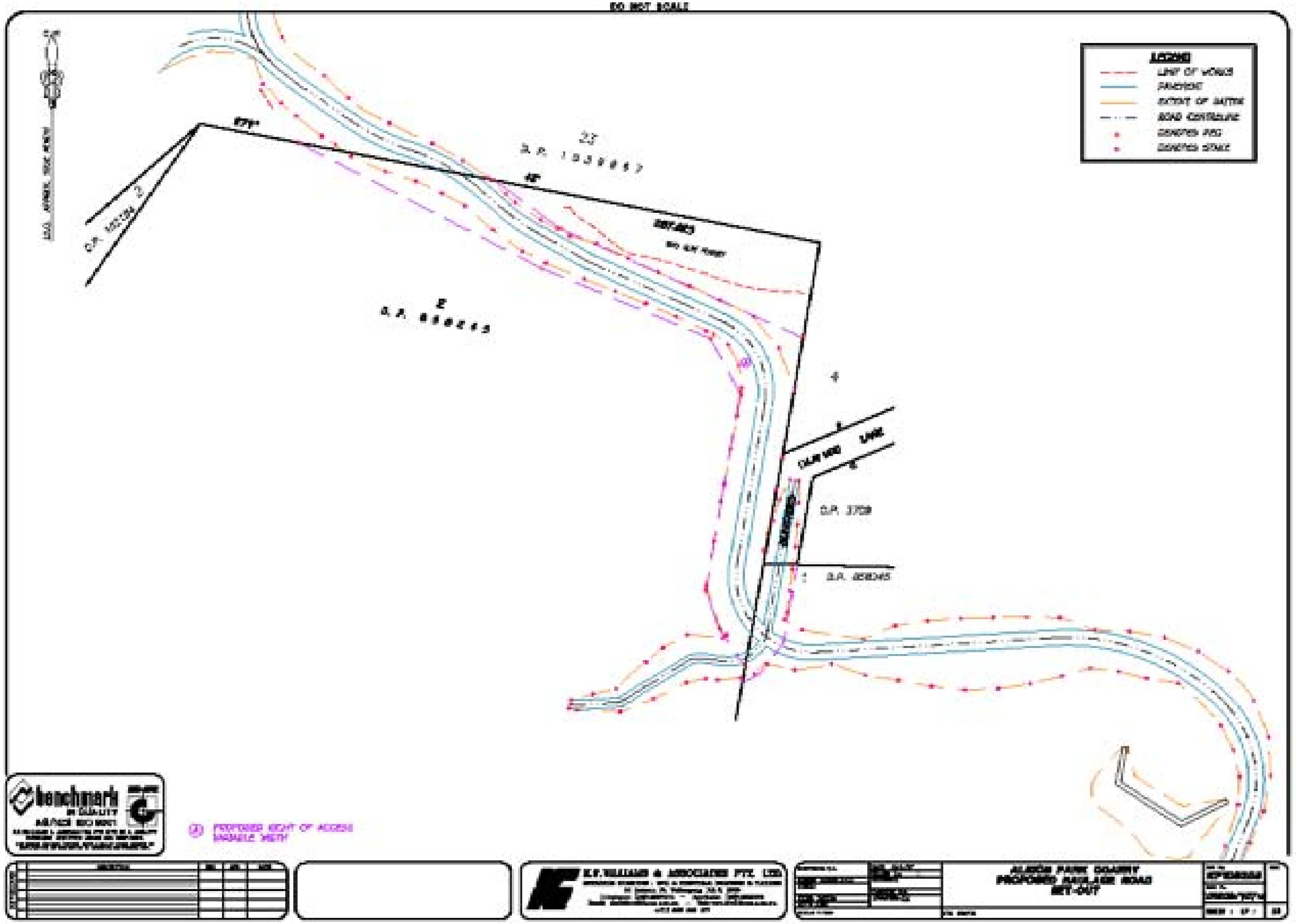
5. Monitoring performance of rehabilitation measures

When rehabilitation of the haul road is undertaken, Cleary Bros will monitor surface stability, subsidence, re-establishment of weed-free grassland and performance of erosion and sediment controls. Monitoring will occur every three months until a stable, grassed surface has been achieved. Should monitoring indicate that corrective action is required, Cleary Bros will promptly undertake the necessary works.

Monitoring results and corrective action will be reported to the Community Consultative Committee.

Prepared by Perram & Partners
27 September 2007

DO NOT SCALE


LEGEND
LIMIT OF WORKS
PAVEMENT
EXTENT OF BATTER
ROAD CENTRELINE
D.P. 1039867
23
D.P. 1021294
D.P. 858245
D.P. 3709
D.P. 858245
DO NOT SCALE
PROPOSED RIGHT OF ACCESS
VARIABLE WIDTH
benchmark
K.F. WILLIAMS & ASSOCIATES PTY. LTD.
ALBION PARK QUARRY
PROPOSED HAULAGE ROAD
SET-OUT

Appendix G

WATER BALANCE

QUARRY WATER BALANCE

1. Introduction and Summary

Prior to the extension onto Lot 1 DP 858245 Cleary Bros Albion Park quarry has been self-sufficient for water. Water harvested in the existing quarry and the surrounding catchment and stored in the existing storage has proven more than sufficient for the processing plant, haul road and quarry operations.

The quarry extension onto Lot 1 DP 858245 will progressively increase the water catchment and water availability for the consolidated site accompanied by an increase in water demand associated with the new access road. In the early years the quarry extension will utilise water from the existing storage supplemented with water harvested on the new site. As the quarry extension expands, the quantity of water harvested in the excavation will increase, largely eliminating the need for water to be taken from the existing storage.

2. Water Demand

2.1 EIS Prediction

The water demand of the quarry extension was outlined on page 3.14 of the EIS (Perram & Partners 2003), being approximately 20 megalitres per annum, increasing to about 22 megalitres during particular years where there is a significant revegetation component. Those figures are no longer valid because the new route of the access road is significantly shorter, the road is now only half the width (7 metres) of the road described in the EIS and the dust management plan requires a greater rate of application of dust suppression water than used for EIS calculations.

The EIS proposed that all vehicles would access the quarry extension by passing along the access road to the existing quarry and then via a new 14 metre wide road, 400 metres in length, to the quarry extension. According to the access configuration described in the EIS, additional dust suppression water was required for the 400 metre section of new road along the ridge and a similar length of road within the quarry extension leading to the workface.

For the purpose of calculating additional demand, it was assumed in the EIS that dust suppression on the existing haul road from the processing plant to the now exhausted quarry would continue to be provided from the existing sources as there would be no change to the use of this road. However with the relocation of quarry access, the road to the existing quarry will fall into disuse with little or no demand for dust suppression water. Instead existing sources will service dust suppression on the relocated haul road leading over the ridge

to the boundary of the quarry extension. This road is slightly shorter and narrower though more exposed than the route to the old quarry. For this reason it is assumed the demand for dust suppression water from the existing storage will be largely unchanged. The quarry extension will require additional dust suppression water only for the section of haul road within the extension area.

2.2 Recalculated Water Demand

Water demand for potable use, irrigation and fire fighting will not change from predictions contained in the EIS. Dust suppression water has been revised because of the changed road area and rate of application. Revised water demand is summarised in *Table 1* below:

Table 1 QUARRY EXTENSION WATER DEMAND

Use	Source	Annual Requirement (megalitres)
Potable (in the quarry)	Delivery to small on-site tank	negligible
Dust Suppression	Collected rainfall runoff	15
Irrigation	Collected rainfall runoff	1.2
Fire fighting	Collected rainfall runoff	nil

The dust suppression water quantity is based on a daily application of two litres per square metre per hour (see section 5.8) over a haul road of about 500 metres in length (3,500 square metres) for nine hours per day on 238 non-rain days per year.

The water demand in the quarry extension will be approximately 15 megalitres per year increasing to about 16.2 megalitres during particular years where there is a significant revegetation component. This will occur in the first year while the bunds and external revegetation areas are being established and then after Year 15 when overburden placement areas reach final profile.

2.3 Water for Existing Uses

There is an existing water demand for the processing plant and haul road between it and the quarry boundary, which is serviced from existing storage on the northern side of the Wentworth Hills. The existing supply and demand is discussed in section 4 below.

3. Quarry Extension Water Supply

Page 3.14 of the EIS states that water will be obtained from existing storages associated with the existing quarry and processing plant as well as water captured by the quarry extension.

Table 2 below summarises the average water availability from the quarry extension as the land is progressively disturbed for quarrying. The following assumptions are implicit in the table:

- the additional catchment for each stage will become available early in the stage when a collection storage is formed at the low side, as soon as the surface has been stripped of topsoil and overburden;
- volumetric figures are based on the long term average annual rainfall of 1.261 metres;
- the coefficient of runoff is 0.3. This may underestimate the quantity of runoff when overburden is stripped exposing underlying rock;
- groundwater inflow to the workings has been ignored as a water source. If such inflow is significant, it will be balanced by re-injection of water via the infiltration trench on the southern side of the site;
- the quarry storage will have approximate surface dimensions 20 by 60 metres during stages 1 to 3 and will have twice that area for the remaining three stages when the water catchment significantly increases; and
- the average annual evaporation rate of 1.78 m per year (4.9 mm/day) will occur each year;

Table 2 indicates that in years with average rainfall, the quarry extension will be self-sufficient for water after Stage 2 (year 11 onwards). Should a year with higher than average rainfall occur during Stages 1 and 2, the quarry may approach or achieve self sufficiency for that year. Should a dry year occur during Stages 1 or 2, the draw of water from the existing main storage will be greater. The decile 1 annual rainfall (10 per cent driest) recorded at Kiama is 825 millimetres. Should a decile 1 rainfall year occur during Stage 1, the draw from the main storage would be 12.2 megalitres and 8.4 megalitres if the decile 1 year occurred during Stage 2.

In addition to the runoff quantities included in *Table 2*, groundwater would continue to seep through the bedrock and enter the surface drainage system, particularly where quarry extraction cuts off subsurface flow paths. However, this is expected to be balanced by groundwater injection to the infiltration trench for ecological purposes.

Table 2 QUARRY EXTENSION WATER SUPPLY

Stage	**Additional Catchment** (hectares)	**Cumulative Catchment** (hectares)	**Average Annual Runoff** (megalitres)	**Average Annual Pond Evaporation** (megalitres)	**Average Annual Water Availability** (megalitres)	**Average Supplement from Storage Dam** (megalitres)
1	2	2	7.5	2.1	5.4	9.6
2	2	4	15.1	2.1	13	3.2
3	3	7	26.5	2.1	24.4	Not required
4	5.3 internal 2.7 external	15	56.7	4.3	52.4	Not required
5	3	18	68.1	4.3	63.8	Not required
6	3.5	21.5	81.3	4.3	77.0	Not required

4. Existing Storage and Water Use

Cleary Bros has advised that the main storage dam supplying water for the processing plant has a capacity of 24 megalitres to the current level of the pipe overflow. The company advised the storage has further capacity of 21 megalitres above the pipe overflow to the level of the existing spillway. The company can adjust the pipe invert level to store additional water in the higher parts of the reservoir, but this has not been needed to date.

The main storage receives rainfall runoff from the steep slopes in its catchment together with any groundwater that may surface in the catchment area. There are other storages associated with the existing quarry and processing plant, which can contribute further water for operational use.

The processing plant consumes water for spraying on conveyors, stockpiles and the manoeuvring area around the stockpiles at the rate of 45 kilolitres per day or about 11 megalitres per year. Dust suppression on the existing section of haul road would use up to 10 megalitres per year.

Hence the main storage holds more than the annual water requirement for the existing quarry and processing plant and can be reconfigured to hold twice this quantity.

The existing main storage, supplemented by water caught in the existing quarry has more than adequate capacity to make up the shortfall required by the quarry extension during the first two stages (10 years) and to act as a buffer smoothing out variations between wet and dry years.

5. Environmental Release

The creek draining the quarry extension site will not be cut until Stage 4 (Years 16 to 20). Significant water release from the quarry will not be required until that stage is reached. At that time there will be surplus water within the quarry storage for environmental release.

Ecological advice contained in the EIS is that environmental release should mirror the natural behaviour of the creek as far as practicable. For this reason the majority of releases will be during or immediately following wet periods.

Appendix H

EMERGENCY PROCEDURES WORK INSTRUCTION

A.C.N. 000 157 808

CLEARY BROS (BOMBO) PTY LTD

QUARRY DIVISION

ALBION PARK QUARRY

WORK INSTRUCTIONS

1.0 PURPOSE/*SCOPE*

The purpose of this work instruction, is to specify the steps to be taken when faced with emergencies such as fires, fuel explosions, vehicle accidents or emergency evacuations.

2.0 REFERENCES/DEFINITIONS

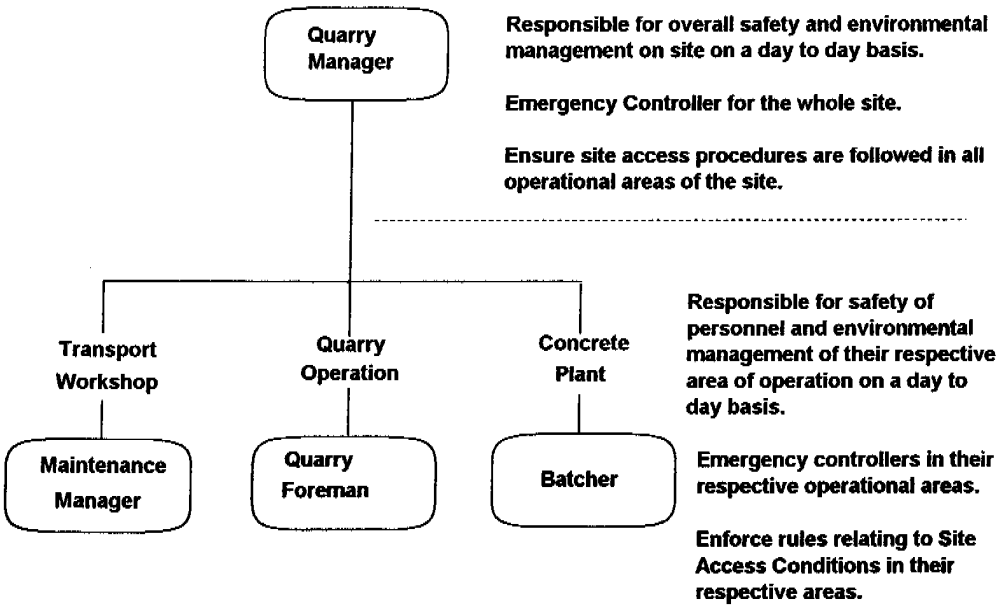
Incident: - An unplanned event which causes or has the potential to cause injury, damage or environmental failure.

3.0 DETAILS

3.1 GENERAL

3.1.1 Albion Park Quarry has on its site, operations which are controlled by three different divisions of the company - Quarry Division, Concrete Division and Transport Division. Because of this, the day to day reporting structure for emergency procedures will differ from the reporting structure for normal operational activities to enable an integrated effective approach. Figure 1 shows the organisational chart and the associated responsibilities for emergency procedures.

Figure 1 - Site Organisation Chart for Emergencies



3.2 EMERGENCY CONTROLLER

3.2.1 During operating hours and after hours, the site person in charge of each area will become the Emergency Controller as follows:

- Quarry - Quarry Manager or Quarry Foreman
- Concrete Plant - Batcher
- Workshops - Maintenance Manager or Workshop Foreman.

Note: The Quarry Manager, having overall responsibility for the site, may also assume the roll of an Emergency Controller for any situation on the quarry site.

3.2.2 The roll of the Emergency Controller is to assume control of the situation until such time as a more senior supervisor, manager or emergency services officer assumes that roll. The Emergency Controller should

- assess the extent of the emergency
- raise the evacuation alarm if required
- *The company radio or CB radio channel 26 may be used to contact the Weighbridge who will assist in contacting the Emergency services required.*
- *A telephone may also be used , dial 000, stay calm and in a clear and precise manner ask the person you are talking to, to connect you to the Fire Brigade, Police or Ambulance which ever service or services are required. Stay on the telephone and follow all voice instructions.*
- notify appropriate persons and organisations within and outside the company
- call on the first aid officer to assess casualties and provide or arrange for treatment as required
- identify further hazards and take measures to minimise their potential danger
- as much as possible preserve evidence which will have a bearing on any subsequent investigation.

3.3 SPILL OF HAZARDOUS MATERIAL

3.3.1 The person identifying the spill shall immediately notify the appropriate Emergency Controller who shall ensure that the following steps are taken.

1. In a safe manner, isolate the source of the spill.

2. Contain the spill from spreading or reaching drainage systems.

3. Identify the spilled material and determine the appropriate means of disposal.

3.4 FIRES AND EXPLOSION OF LIQUID FUEL

3.4.1 The person identifying the fire should, if feasible and safe, attempt to extinguish it immediately. If it is not feasible or not successful, the appropriate Emergency Controller must immediately be notified.

3.4.2 The Emergency Controller:

- notifies the *Shellharbour/Kiama Bush Fire Services*
- evacuates the immediate area if deemed necessary and
- organises first aid, medical treatment or ambulance as required and ensures all persons can be accounted for.
- takes control of the firefighting effort until the Fire Brigade arrives.

Measures taken may include using portable fire extinguishers, engaging the use of the water truck and shutting off power supply to affected areas.

3.4.3 When the Fire Brigade arrives, the Emergency Controller hands control over to the officer in charge and briefs him as to the following:

- injured or trapped persons needing their help
- highly flammable materials in close proximity to the fire
- isolations and or draining of fuels carried out.

3.4.4 If the bushfire is approaching the explosives magazine, the site must be evacuated and sealed off for a one kilometre radius around the magazine. The Emergency Controller must recognise that a firefighter's first instinct is to fight the fire and should not leave it up to the fire fighters to decide when to pull out.

3.4.5 If a vehicle catches fire it should not be left in from the vicinity of the magazine.

3.5 EXPLOSION OF EXPLOSIVES MAGAZINE

3.5.1 In the event of explosion of the explosives magazine the Quarry Manager will call an emergency evacuation to the meeting place at the weighbridge. An attempt will be made to account for all persons who were on site.

3.5.2 The Quarry Manager will:

- seal off the area within a one kilometre radius for one hour after the last blast.

- send in recognised experts to look for unexploded explosives which may have been scattered.
  (for further advice relating to an incident, contact Orica Australia 24 hour emergency response service 1800033111).

3.5.3 Where there are injured persons, they will be dealt with in accordance with clause 3.8.

3.5.4 Ensure that measures are taken to keep all but essential personnel out until such time as the area can be declared safe.

3.6 GAS BOTTLE LEAK

3.6.1 Should a gas bottle be found damaged and leaking, the following steps should be taken:

(i) ensure there are no ignition sources in the area

(ii) clear the area of personnel and visitors

(iii) if possible and safe to do so, isolate the leaking bottle from other gas bottles or explosive materials and place it in a well ventilated area.

Danger: Evaporating liquid may cause cold burns. Wear safety glasses and leather gloves while handling a leaking bottle. acetylene could cause oxygen depletion in a confined space.

(iv) Contact the Site Manager or other Emergency Controller.

(v) The Emergency controller should ring BOC Gases emergency number 1800 044 149 for further advice on dealing with the situation.

3.6.2 If an acetylene bottle has caught fire close to the valve, turn it off and feel the bottle to make sure it is not getting hot. If it is getting hot it could mean that it is burning inside the bottle. In this event, keep the bottle cool, by continuous hosing from a protected location and have someone call the fire brigade.

3.6.3 If the fire is from a cylinder is impinging on flammable materials or other cylinders, then:

(i) Evacuate uninvolved personnel and call the fire brigade.

(ii) Do not attempt to approach or remove cylinders.

(iii) From a protected location, drench the entire surface of all cylinders with water until the fire brigade arrives and then hand control over to them. Appendix 4.2 shows the procedure that they should follow.

3.6.4 If the cylinder is standing alone and the fire is not impinging on the flammable materials:

(i) evacuate uninvolved personnel

(ii) from a protected location, spray water on the cylinder to keep it cool; eliminate all sources of ignition.

(iii) Extinguish the flame with dry powder extinguisher and shut the cylinder valve if this will stop the leak.

(iv) recommence and continue water spray until the fire brigade arrives.

(v) Ensure the working area is well ventilated before use.

3.7 VEHICULAR ACCIDENTS

3.7.1 Staff witnessing a motor vehicle accident should notify the appropriate emergency controller who will:

- see if anyone is injured and arrange for first aid assistance or ambulance as appropriate
- contact the police if deemed appropriate
- make written records of witness's statements and *complete an Incident Report. Also an Accident Investigation Report is to be completed if required.*

3.8 PERSONAL INJURY

3.8.1 The injured person or witness should contact the appropriate emergency controller who will organise first aid or an ambulance as appropriate.

3.8.2 Do not attempt to move injured persons who may have a sustained a spinal injury.

3.8.3 Take steps to eliminate further immediate danger.

3.8.4 Do not disturb evidence where possible.

3.8.5 Be prepared to brief the emergency controller or emergency services when they arrive.

3.9 EVACUATION PROCEDURES

3.9.1 When evacuation is required, the appropriate Emergency Controller will

- give the order to evacuate
- notify the Quarry Manager of the emergency circumstances.

3.9.2 On being notified of the evacuation, all personnel shall proceed to the weighbridge area where a roll call will be carried out by the supervisors and further instructions will be given.

3.10 TERMINATION OF EMERGENCY

3.10.1 In an emergency involving external emergency services, when the role of the emergency services is complete, control is handed back to the Emergency Controller who will assess the situation and decide on any additional actions before declaring termination of the emergency.

3.10.2 On declaring termination of the emergency, the Emergency Controller advises Operators of the termination of emergency.

3.10.3 The Emergency Controller will arrange for clean-up of any spill and safe disposal of any contaminated material as a result of the emergency.

3.10.4 The Manager for each affected area should:

- inform those affected what has happened and what they should do now
- identify witnesses to help with further investigations
- identify those who may need trauma counselling and refer them to the Rehabilitation Coordinator.

3.11 EVALUATION OF RESPONSE

3.11.1 A review shall be conducted after all serious incidents by the Divisional Manager and those nominated to be called on as Emergency Controllers. A report based on the review will include the following:

- brief summary
- conclusions
- recommendations
- method of investigation
- findings of the investigation
- discussion of the findings
- ways of avoiding recurrence of similar incidents
- review of the emergency plan in relation to the incident.

This report will be forwarded to the Technical Manager and CEO within 7 days of the incident.

4.0 APPENDICES

4.1 Outside Services - Emergency Phone Numbers

4.2 Procedure for dealing with fire impinging on flammable materials or other cylinders.

Cleary Bros
Albion Park Quarry

EMERGENCY PHONE NUMBERS

Emergency Number 000 connects to the *Telstra* Switchboard. The person dialling must ask to be connected to the emergency service required

POLICE	
Emergency	000 "Police"
Warilla	42952699
Albion Park	42561044
FIRE BRIGADE	
Emergency	000
Shellhabour-Kiama Bush Fire Services	42562500
AMBULANCE	
Emergency	000
All Areas	131233
HOSPITALS	
Shellharbour Hospital	42952500
STATE EMERGENCY SERVICES	
Shellharbour Municipality	4257 1010
ENVIRONMENT PROTECTION AUTHORITY	
Wollongong	42244100
NATURAL GAS COMPANY	131909
BOC GAS	1800044149
POISONS INFORMATION	131126
MAXAM	1800 833 111
ELECTRICITY	131003
SYDNEY WATER	
Emergency Inquiries	132090

EMERGENCY CONTROLLERS

Operations Manager	0408322213	42961837
Quarry Manager	0418603398	42564241
Quarry Foreman	0413239064	

PROCEDURE FOR DEALING WITH FIRE FROM A CYLINDER IMPINGING ON FLAMMABLE MATERIALS OR OTHER CYLINDERS

(i) Do not attempt to approach or remove cylinders.

(ii) From a protected location, drench the entire surface of all cylinders with water for at least one hour after the fire has been extinguished;

(iii) From a safe position, check every 30 minutes to see if steam is coming from the surface of the cylinder when hosing is interrupted. Once steam has stopped, from a safe position, check that the surface remains wet. If patches of the bottle dry quickly when hosing is stopped, continue to hose with water as before. Once all of the cylinder surface remains wet, check with bare hand that cylinder remains cool for 30 minutes. Wait a further 30 minutes and recheck as the surface temperature. if any part feels warm, then reapply the water and check as before.

(iv) When the surface of the cylinder remains cool for one hour, submerge the cylinder in water, carefully avoiding shocks and bumps. The cylinder may normally be recovered after 12 hours immersion.

Appendix I

CUSTOMER FEEDBACK FORM

CUSTOMER FEEDBACK FORM

Please complete this form and return it to: *Internal Quality Auditor*
Cleary Bros (Bombo) Pty Ltd
PO Box 210 Port Kembla 2505

NAME: _____ DATE: _____ TIME:_____

ADDRESS – No & Street: _____ PHONE – Home: _____
Suburb: _____ Work: _____
Postcode:_____

FEEBDBACK:
☐ To do with charges
☐ To do with service
☐ Other

Where did the incident occur? _____
Details: _____
_____
_____
_____
_____

YOUR SUGGESTION IS IMPORTANT TO US
How do you suggest that we resolve the issue to your satisfaction and/or ensure that you and other customers who are in a similar position are not confronted with this issue again:

Thank you for taking the time to help us improve our service to you, our customer. People such as yourself have been a significant help in increasing the effectiveness of our policy of maintaining customer service to the highest standard.

SIGNATURES

Customer: _____ Cleary Bros Representative: _____

OFFICE USE

Customer Feedback Registration Number:_____ NCR/CAR Number: _____

Response to customer feedback: _____
_____
_____
_____
_____
_____
_____

Perceived Effectiveness of Response: _____
_____

Cleary Bros Concrete & Quarrying Customer Complaint & Feedback Register

Plant/Quarry: _____

Complaint or Feedback Number	NCR/CAR No.	Date Complaint or Feedback Made	Name of Person	Brief Description of Complaint or Feedback	Handled by	Closed Out	No Customer Feedback Forms Since Last Man Review