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KIN KIN QUARRY
150 Sheppersons Lane, Kin Kin

Quarry Management Plan
incorporating Environmental Management Plan

Prepared for:
Neilsen's Quality Gravels Pty Ltd

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Table of Contents

Table of Contents

Table of Contents

Table of Contents

TABLES

FIGURES

APPENDICES

Report Summary

This Quarry Management Plan provides details for the operation of the Kin Kin Quarry located at Sheppersons Lane, approximately 2.5 km South-East of Kin Kin, Queensland. The site the subject of the development is Lot 259 on Crown Plan MCH 187 in the County of March, Parish of Noosa, title reference 12433112.

The resource on site consists of Andesitic volcanics, which is suitable as a source rock for asphalt aggregate, concrete aggregate, road pavements and a wide range of other hard rock quarry products.

Reserves have been estimated at 21.0 million tonnes (Mt) of Slightly Weathered to Unweathered Latite (Andesite), with another 3.6Mt of Distinctly Weathered and Altered Latite. Overburden consists of extremely weathered latite and sandstone. A quarry life in excess of 30 years is envisaged.

Over the first few years of operation quarry production is expected to be in the range of 200,000 tpa to 300,000 tpa (tonnes per annum), and increasing beyond this depending on the market needs and availability of quarry materials. The registered environmental relevant activities for the quarry provide for production of between 100,000 tpa and 1,000,000 tpa.

This Quarry Management Plan (QMP) is the third QMP for the Kin Kin site and replaces the second QMP from 2005.

This Quarry Management Plan consists of two sections:

i. The *Quarry Development Plan* which details the plans for developing the resource on site in a cost effective, safe and efficient manner, and the

ii. *Environmental Management Plan* which provides details of the plans, procedures and performance targets to assist the quarry operate in an environmentally responsible manner.

Whilst the *Quarry Development Plan* covers the life of the quarry through to post extractive use, it has more discussion on the ongoing development activities over the period of the next 5 to 7 years.

The quarry site has current town planning consent (TPC) from Noosa Council (TPC 1899 – 21/7 1987). This TPC was subsequently modified by Court Order dated 13/5/1988. Council extended the term of the approval on 2nd December 2003. The Environmental Protection Agency (now DERM) acting as assessment manager issued a development permit for the quarry dated 6th February 2006. This Quarry Management Plan has also been prepared in accordance with the provisions of General Condition 3 of the above development permit, requiring the implementation of a Site Based Management Plan (SBMP).

1. INTRODUCTION

1.1 Project Description

Neilsen Developments Pty Ltd currently has a Lease Agreement with John Shepperson, the owner of the Kin Kin Quarry land, to develop and operate the Kin Kin Quarry.

The Kin Kin Quarry is located on Sheppersons Lane, approximately 2.5 km South-East of Kin Kin (refer to FIGURE 1 – SITE LOCATION PLAN). This quarry was previously operated by the Noosa Shire Council.

The resource on site consists of Andesitic volcanic ('latite'), which is a suitable rock source for aggregate, road pavements, drainage media, rip rap and other quarried products. Source rocks of this quality available for quarrying in the Sunshine Coast region are scarce and because of this, high quality aggregates for road surfacing must be imported into the Sunshine Coast from quarries located in other local government areas. The quarry will provide a local source of high quality aggregates and roadbase materials to help satisfy the local needs of the Sunshine Coast.

Quarrying of the Andesite deposit will be undertaken using proven open cut extraction techniques comprising the following basic elements:

- Progressive removal of vegetation as required and stripping of topsoil. Topsoil would be used for rehabilitation and general site civil works;
- Stripping of highly weathered rock (overburden) by dozer to reveal harder, fresher and competent rock;
- Drilling and blasting of the hard rock material to produce working benches with nominal vertical heights of 15m. The bench faces would be inclined at approximately 70^{o} to 80^{o} from the horizontal;
- Extraction of the Andesitic volcanics would take place sequentially both laterally and vertically resulting in the development of an open cut pit incorporating multiple benches.
- To minimise the extractive and cleared land footprint during early quarry development, the quarry is to be worked initially from the bottom over several benches. As the quarry matures, additional benches further up the hillside will need to be established. Because the terrain is steep the haul road needs to be constructed and stabilised during dry weather and soil conditions.

The rock will be processed on site in a multi-stage crushing, screening and blending plant to produce a range of road base pavement materials and crushed aggregates for delivery in road trucks to the marketplace. Initially, portable crushing and screening plant will be used. The plant will be established at working bench level near the initial lower quarry workings. Product deliveries are via the existing Quarry Access road through Lot 258 to Sheppersons Lane.

Building, construction and ancillary activities that will be progressively established as required include administration offices, weighbridge, stores, truck and machinery compounds, stockpile pads, employee amenities, workshops, electricity transformers, water storages, haul roads, erosion and sediment controls, pumps, dust controls and security measures.

A substantial works program of sediment and erosion control measures including the construction of a large primary sediment pond, a secondary pond for removal of clay/silt from water prior to discharge, and silt storage cells have been completed by the quarry in 2011.

1.2 Scope and Purpose of the Quarry Management Plan

This Quarry Management Plan (QMP) has been prepared as an update to the previous 2005 Quarry Management Plan (which it replaces) for Extractive Industry situated at 150 Sheppersons Lane, Kin Kin". Seven (7) years have elapsed since the QMP was prepared. Initial site and quarry development works and stormwater, sediment and erosion controls have been completed at the quarry.

This updated QMP reflects these works and also addresses the requirements for a Site Based Management Plan as per General Condition 3 of DERM (EPA) Development Permit IPDE00324405A11 dated 6th February 2006.

Key environmental management issues have been addressed in detail and subordinate issues have been addressed to a level appropriate to the nature and extent of the potential impact.

1.3 Quarry Planning & Development is Ongoing

Quarry planning, development and scheduling are ongoing activities and rely on feedback from actual operations, in forward planning. It is important to note that quarrying like mining, occurs progressively over time (along with results of exploration drilling) and uses the information and experience gained from its actual operations, in the detailed planning of the development of its future stages.

This is a fundamental tenet of risk management in mining and quarrying - actual ground conditions encountered and operational and risk management issues that arise in the normal course of quarrying are crucial determinants in influencing future quarry planning and scheduling of operations.

For this reason, the quarry development within the area of land in which it is approved to conduct its approved activities is ultimately driven by risk management of safety, environmental, operational and market factors and issues. These factors can change the level and nature of activity, even the quarrying method, over the life of a quarry. Accordingly over time and for perfectly sensible reasons, the quarry development and site-based management plans need to evolve and change to reflect real world, real time, ground conditions and operational issues. When facts and circumstances change, so too must operational and management practices.

This 'attribute' of the evolving nature of quarries is different from a building or a subdivision development as noted in the decision by Justice Dodds in *Kin Kin Community Group Inc. v Sunshine Coast Regional Council & Ors* [2010] QPEC 144 where he observed:

[91] " The purpose of a quarry is to obtain the resource being quarried. The resource is a valuable community commodity. As earlier observed establishing a quarry and quarrying is expensive and the full extent and quality of the resource, where it is buried rock can only be known as the quarrying operation proceeds. It is not akin to a building plan or subdivision which may be presented with clear
boundaries on a plan. … "

For a long-term development like a mine or a quarry, the quarry is developed in stages and this development is ongoing over the life of the quarry. Because of economic cycles, during the life of a quarry there may be several boom periods as well as other periods of lower activity, and the quarry must be developed and managed according to these cycles.

Additional works and infrastructure needed for the staged future quarry development will be built and constructed as it becomes necessary – whilst its general location can be known (such as a haul road access to an upper bench), its final design and route is a function of many practical things such as actual ground conditions encountered, site specific safety and environmental management considerations, practicality, risk of other consequences (eg slope stability, erosion) and available technology and equipment etc.
To address the evolving nature of quarries and the need for ongoing risk management and review of controls, the Kin Kin Quarry Management Plan will be updated every five years, over the life of the quarry's andesite resources. Future updated QMP's will be submitted to Council as part of the conditions of approval for the quarry site.

1.4 Background

Readymix (now owned by Swiss company Holcim) initially assessed the andesite at the site in 1991, and produced a report on Quarry Development. They did not proceed with the quarry development at the time. Subsequently, Noosa Council undertook quarrying on a campaign basis in 1996 and 1999. Approximately 50,000 tonnes of quarry materials in total were extracted for local roadworks. In 2003, Groundwork EMS Pty Ltd (now Groundwork Plus) undertook some preliminary investigations for Neilson's Quality Gravels Pty Ltd.

Neilsens commenced initial works to establish the quarry in 2010. In 2011 following heavy rains DERM issued an Environmental Protection Order requiring that sediment and erosion controls at the quarry site be upgraded to adequately retain and treat stormwater contaminated with clay and silt. These civil works have been completed at the date of this amended Quarry Management Plan.

The real property for the quarry land is described as Lot 259 on Crown Plan MCH187 in the County of March, Parish of Noosa, title reference 12433112. It comprises an area of 60.02 hectares.

The quarry site is on the northern flanks of the Wahpunga Range in an identified Key Resource Area (KRA 57) under State Planning Policy (SPP 2/07) Protection of Extractive Resources.

There is a demand for the aggregates and other hard rock quarry products from the Kin Kin Quarry because of the ongoing need for building and construction materials in our built environment, and as other quarry resources in the Sunshine Coast market become depleted.

The quarry is located in a rural area with important rural and environmental values - in particular the site is within the catchment of the Wahpunga Creek (Kin Kin / Lake Cootharaba sub-catchment) of the Noosa River Catchment area.

Regional Ecosystem 12.11.5 (Mixed tall open forest – 90%) and Regional Ecosystem 12.11.16 (Eucalyptus cloeziana tall open forest – 10%) fringe the southern and eastern boundary of the property. Regional Ecosystem 12.11.16 is classified as a Remnant Endangered Regional Ecosystem "of concern".

1.5 Legislation

Extractive Industry is regulated by a wide range of principal Acts, Regulations and Policies relating to safety, commercial activities, environment, resources, cultural values, fauna, vegetation, traffic, land use, land management and fire management.

Legislation particularly relevant to the operation of the Kin Kin Quarry includes:

- *Sustainable Planning Act (2009) and where relevant its predecessor, the Integrated Planning Act (1997) and Regulations*
- *Environmental Protection Act (1994), Regulations and Environmental Protection Policies (as updated)*
- *Vegetation Management Act (1999) and Regulations*
- *Nature Conservation Act (1992) and Regulations*
- *Mine and Quarrying Safety and Health Act (1999) and Regulations and Codes*
- *Water Act (2000) and Regulations*

1.6 Existing Approvals

The site has current town planning consent (TPC) from Noosa Council (TPC 1899 – 21/7 1987). This TPC was subsequently modified by Court Order dated 13/5/1988. Council extended the term of the approval on 2nd December 2003 to 12th May 2033. The Environmental Protection Agency (now DERM) acting as assessment manager issued a development permit for the quarry dated 6th February 2006.

This Quarry Management Plan has also been prepared in accordance with the provisions of General Condition 3 of the above development permit, requiring the implementation of a Site Based Management Plan (SBMP).

The Kin Kin Quarry has also been issued with EPA Permit No. IPDE00324405A11 issued 6th February 2006. These include conditions of approval.

A copy of the permits and the conditions of approval are attached to this management plan as APPENDIX 3: COUNCIL APPROVAL & EPA (DERM) DEVELOPMENT PERMIT AND CONDITIONS.

The Environmentally Relevant Activities (ERA's) authorised for the quarry site under these approvals are:

- ERA 16 2 (c) Extraction etc between 100,000 and 1,000,000 tonnes per year;
- ERA 16 3 (b) Screening etc; as above
- ERA 8 3(a) Chemical Storage and
- ERA 21 Motor Vehicle Workshop

2. QUARRY DEVELOPMENT PLAN

2.1 Project Description

Neilsen Quality Gravels Pty Ltd (Neilsen's) has completed initial quarry establishment works on Lot 259 on Crown Plan MCH 187 in the County of March, Parish of Noosa. The site is located approximately 2.5km south-east of Kin Kin (refer FIGURE 1 – SITE LOCATION).

The Andesite source rock will be extracted by conventional quarrying methods. Initially the quarry workings will be established at the base of the hillside as shown in FIGURE 3A SHORT TERM QUARRY DEVELOPMENT PLAN.

This has several practical benefits:

- It defers the need to build the haul road to the top of the deposit immediately (especially during wetter La Nina periods) and establishes a supply of rock for aggregates from a more accessible area (by initially quarrying in the lower hillside from previously worked areas where most of the overburden has been removed); and

- It allows the necessary room for the portable crushing and screening plant and the initial stockpile area for the quarry, given that part of the previously allocated space for stockpiling and truck manoeuvring has been allocated and used for the construction of the primary sediment basin; and

- It allows time to open up the deposit and gain first-hand experience of the actual ground conditions, soil profile, overburden distribution, detailed geotechnical information etc – these geoscientific inputs are critical to future mine (quarry) planning, and scheduling of operations and they will continue over the life of the quarry.

The geotechnical information from initial quarrying and further geotechnical assessment will be used to guide construction of civil works such as diversion drains, haul road access and road access to the future fixed processing plant site. The location of these works is shown in the annotated map (PLATE 1) in section 2.4. The works will be constructed over the next few years. Before the works commence site specific stormwater management and sediment and erosion controls will be put in place.

Once the lower workings are advanced over an estimated period of 5 years, the quarry will then be developed from the top down. This is illustrated in FIGURE 4 as a series of stages (Stages 1 to 4). During the period 2012 to 2017, the haul road access to the top of the deposit will be constructed. Prior to this construction appropriate stormwater management and sediment and erosion controls will be installed. Once these works are in place Stage 1 (as shown on FIGURE 4) can commence.

The installation of a fixed crushing and screening plant will occur when market conditions dictate and when the quarry has been opened up and haul road access plant building areas excavated and prepared. This is expected to occur within the 5 year period from 2014 to 2019[1].

It is important to note that in the steeper portions of the site, slope instability (slump) features are evident from the wet weather in the past year or two. Accordingly, slope stability is an important determinant in the timing of extraction works and development of future quarry infrastructure – for environmental and safety reasons, works that expose the clay soils and overburden of the site must be confined to dryer periods (lower risk of rainfall) to ensure that construction of works takes place when soils are not saturated.
The broken rock extracted from the site will be processed into a range of aggregate, roadbase and oversized quarry products and delivered to customers via Shepperson's Lane and the Pomona – Kin Kin Road.

[1] Subject to actual ground and market conditions encountered and can therefore change

The construction of initial site works to enable commercial production to commence include internal site access roads, hardstand areas, erosion and sediment controls, sediment dams and flocculation controls, initial water storages, stormwater runoff diversion channels, the introduction of portable crushing and screening equipment, the construction of stockpile pads, initial overburden removal, construction of offices and amenities, amenity bunds and hardstand areas for vehicle traffic including vehicle servicing. These works have been completed. Perimeter fencing is to be checked regularly and repairs and improvements made as necessary.

The quarry will develop by controlled extraction from the defined resource area in a series of stages over an anticipated period of several decades. Site activities will be controlled by a quarry development and site-based management plan that focuses on the mitigation and management of environmental impacts. These will be reviewed regularly and when conditions at the quarry change. For the term of this development plan extractive operations will remain within the boundaries of area indicated on FIGURE 4 DEVELOPMENT STAGES and FIGURE 5 SITE LAYOUT.

Advances in technology or science relating to quarrying or environmental management may be utilised during the development of this quarry, thus modifying the implementation and the design outlined in this Quarry Management Plan. The development will embody a high level of environmental control to conform with company policy, statutory requirements and public expectation.

2.2 Site Details

Location:	The Kin Kin Quarry site is located 2.5km south-east of Kin Kin (refer FIGURE 1 – SITE LOCATION).
The Site:	The subject land is Lot 259 on Crown Plan MCH 187 in the County of March, Parish of Noosa, title reference 12433112 (refer FIGURE 2 – SITE AND SURROUNDS).
Principal Address:	Shepperson's Lane, Kin Kin, Queensland, 4571.
Access:	The access to the quarry is via the Kin Kin – Pomona Road, and thence via Shepperson's Lane and Lot 258, to the quarry on Lot 259 (refer FIGURE 6 – SITE ACCESS ROAD).
Tenure Registered Proprietors, Area:	Land Parcel: Lot 259 on Crown Plan MCH187 Tenure: Fee Simple Registered Proprietor: John Wallace Shepperson Area (ha): 60.02
Road Frontages:	Simpsons Road: 650 metres (approximately) Murrays Road: 950 metres (approximately) Un-named road: 10 metres (approximately)

Note that all roads are gazetted Roads but currently not formed.

Local Authority:	Sunshine Coast Council (formerly Noosa Council).
Local Planning Scheme	The Noosa Plan.

Zoning:	Rural
Overlay Maps:	Key Extractive Resource/Processing Area Extractive Resource Separation Area Environmental Protection Area High/medium Bushfire Hazard area Landslide Hazard Area Agricultural Land Conservation Area
Land Use:	The land is currently used for grazing and Extractive Industry. The surrounding properties are used for grazing. The nearest residence is located 800m north west of the quarry site (the Shepperson residence).
Site Improvements:	Site improvements relate to grazing activities and include pasture improvement, clearing, fencing, tracks, farm dams and extractive industry workings.
Landform:	The land lies between about 60 metres and 250 meters Australian Height Datum (AHD). The elevated areas comprise a moderately inclined plateau and the lower areas are moderately inclined (1 in 5 slope). In between is a North West facing steeply inclined slope (1 in 2.3 slope), which has been incised by two drainage lines (refer FIGURES 7A-7D STORMWATER, SEDIMENT AND EROSION CONTOL PLAN).
Vegetation:	The predominant vegetation is pasture with isolated trees. Isolated areas of mixed tall open forest occur on the upper ridges of the area, containing spotted gum, in addition to Corymbia citroidora, Eucalyptus siderophloia, E. crebra, E.major. This mixed tall open forest contains 10% regional ecosystem 12.11.16, which has a conservation status “of concern”. There is a mixed understorey of grasses, shrubs and ferns.
Geology:	Permian Andesitic volcanics (‘latite’) overlain by Siltstone and medium to coarse-grained Arenite of the Early to Middle Triassic Kin Kin Beds. Soils and overburden is a potential source of clay contamination of stormwater.
Rock Resources:	Resources are sufficient for more than 30 yrs of Quarry Life.

2.3 Project Planning

Development planning has involved consideration of a range of individual and combined environmental and operational constraints to evolve a preferred option for site development.

The principal constraints considered are stormwater quality, visibility, safety, noise, dust, ground vibration, airblast overpressure, rock quality, engineering constraints and resource utilisation. The quarry development method and staging plans have been influenced by the need to minimise clay contamination (from overburden and quarry workings) and erosion caused by stormwater, and the need to maintain slope stability, on a hillside quarry deposit with a gradient in places of approximately 1 V to 2.3 H .

2.4 Site Layout

2.4.1 Initial Construction

This phase referred to as initial construction works are those works required to achieve at least the minimum level of risk management, safety and environmental performance before commercial production of the quarry can commence.

These works include:

- Installation of erosion controls to service the initial quarry development and associated civil works for dams, diversion drains and haul roads;
- Construction of site entry and egress via the existing Quarry access road to Sheppersons Lane – road widening and sealing works are planned for the first half of 2012;
- Construction of internal site access roads to service the stockpile and amenities area, initial quarry workings, access to the diversion/ cutoff drains between RL 130-140m AHD;
- Provision of culverts, rock-lined drains and road drainage works;
- Construction of initial water supply storage and sediment dams and stormwater treatment including the primary sediment dam which will service the initial quarry workings and processing / stockpiling area etc; and the secondary sediment pond (stilling basin) where clay and silt particles are settled out; and two clay/silt drying bays where clay silt materials can be dried for use in blending with roadbase materials;
- Remediation of contaminated soils from a disused cattle dip on the site (contaminated soil removed from site by week ending 28th October 2011);
- Preparation of an initial processing plant area and stockpile areas between the lower quarry workings and around the primary sediment pond;
- Use of a portable (crushing, screening, blending, processing) plant to manufacture quarry products for use on site works including sediment and erosion controls and materials for the Shepperson Lane road works planned for the first half of 2012;
- Erection of necessary buildings and ancillary facilities such as site offices, containers for stores, toilets (portable toilets initially);
- Before commercial operations commence, a washdown area for plant and equipment including slab and water quality management controls;
- Vegetation clearing and overburden removal for initial quarry development;
- Landscaping of the bund wall near the site entrance, sediment dam embankments and initial landscaping of the buffer strip along the western boundary from below RL 90m AHD; the buffer strip above the RL 90m contour will continue to be established over the 2011 and 2012 when safe access (in dry conditions) to the upper slopes is available; and
- Rehabilitation including revegetation with hydro-mulching of road batters and embankments

Further site infrastructure will be developed, as the quarry develops, over the next few decades.

Environmental management measures to minimise the potential impact of activities during current and future construction works are described in the Environmental Management Plan.

2.4.2 Initial Quarry Development

The initial quarry development occurs after the initial construction phase. It has three main components:

i. extraction of andesite from the existing benches at near the base of the hill;
ii. optimisation of layout for traffic safety, portable crushing and screening plant, product stockpile area and finalised location of permanent site buildings;
iii. Ongoing civil construction works necessary in order to establish access to the locations for fixed processing plant and to obtain haul road access to the top of the andesite deposit to enable Stage 1 works for the top down quarrying of the deposit, to commence.

The initial quarry development phase commences in 2012. It is expected to last between 3 and 7 years (say 5 years).

(a) Plans Showing Initial Quarry Development

The initial quarry excavation in the lower hillside and its site context are shown on the following drawings:

FIGURE 3A SHORT TERM QUARRY DEVELOPMENT PLAN.
FIGURE 3B KIN KIN PLAN SHOWING CROSS SECTION A-A', and
FIGURE 3C KIN KIN CROSS SECTION A-A' (at a vertical exaggeration of 2x), show a plan and cross section respectively of the andesite deposit to be quarried.

As the drawings indicate, four (4) benches already partially excavated from previous quarrying activities, comprise the initial development at the base of the hillside.

The benches are at nominal RL's 75, 90, 105 and 120m (AHD). The stockpiling and truck manoeuvring area beside the primary sediment dam is at nominal RL 75m AHD. Access ramps to the RL 90m and RL 105 and 120m benches need to be constructed.

Diversion/cut-off drains have been constructed above the RL 120m bench to divert uncontaminated stormwater away from the quarry workings that will be constructed below.

Stormwater Management Controls

The diversion drains along the RL 130 to RL 140 contours are sufficient to provide stormwater diversion protection to enable extraction for a horizontal distance of approximately 60m into the andesite (measured on the RL 90m AHD bench).

The cross section plan (FIGURE 3B attached) also shows the location of the:

- Primary sediment dam which services the stockpile, plant and workshops/amenities area; and
- The initial lower benches of quarry development.

Future additional sediment basins to service the upper quarry workings will be built into the actual rock of the quarry workings, at the commencement of construction works for that phase of the quarry development. Constructing the sumps or sediment basins in this way places them close to the source of any stormwater contamination from clay and silt.

Wherever possible, the uncontaminated stormwater is diverted away from any disturbed ground using diversion or cut-off drains and channels. A summary of the diversion controls and sumps for the future development of the site is shown in FIGURES 7A-7D STORMWATER, SEDIMENT AND EROSION CONTOL PLAN.

A more detailed description of the stormwater management and sediment and erosion controls for the quarry development is set out in the stormwater environmental management plan (Stormwater EMP) in Section 3.6.

(b) Other Anticipated Construction Works During the Initial Quarry Development Period (estimated at 5 years)

During the initial quarry development stage, various civil construction works also need to be completed so that the quarry can be developed according to the staged plans, as generally shown in FIGURE 4 DEVELOPMENT PLANS. Stage 1 which involves quarrying from the top of the deposit cannot commence until the initial quarry development phase is completed.

The civil construction works (to enable Stage 1 in FIGURE 4 to be developed) include the construction of diversion drains and channels to divert stormwater away from future disturbed areas, the construction of access road ramps to the RL 90m and 105m AHD benches, and construction of the road to the fixed crushing and screening building locations, and then to the top of the deposit. A washdown and servicing area will also be constructed before commercial operations commence. During the initial quarry development period permanent building locations for workshops, stores, laboratory and amenities will be determined (after blasting for initial quarry development works) and building commenced.

An indication of the civil works proposed over the next five to seven years for ongoing quarry development, is shown below in PLATE 1: INDICATION OF PROPOSED SITE DEVELOPMENT WORKS 2012 TO 2017. The sketch uses the stormwater plan for long-term development as a base.

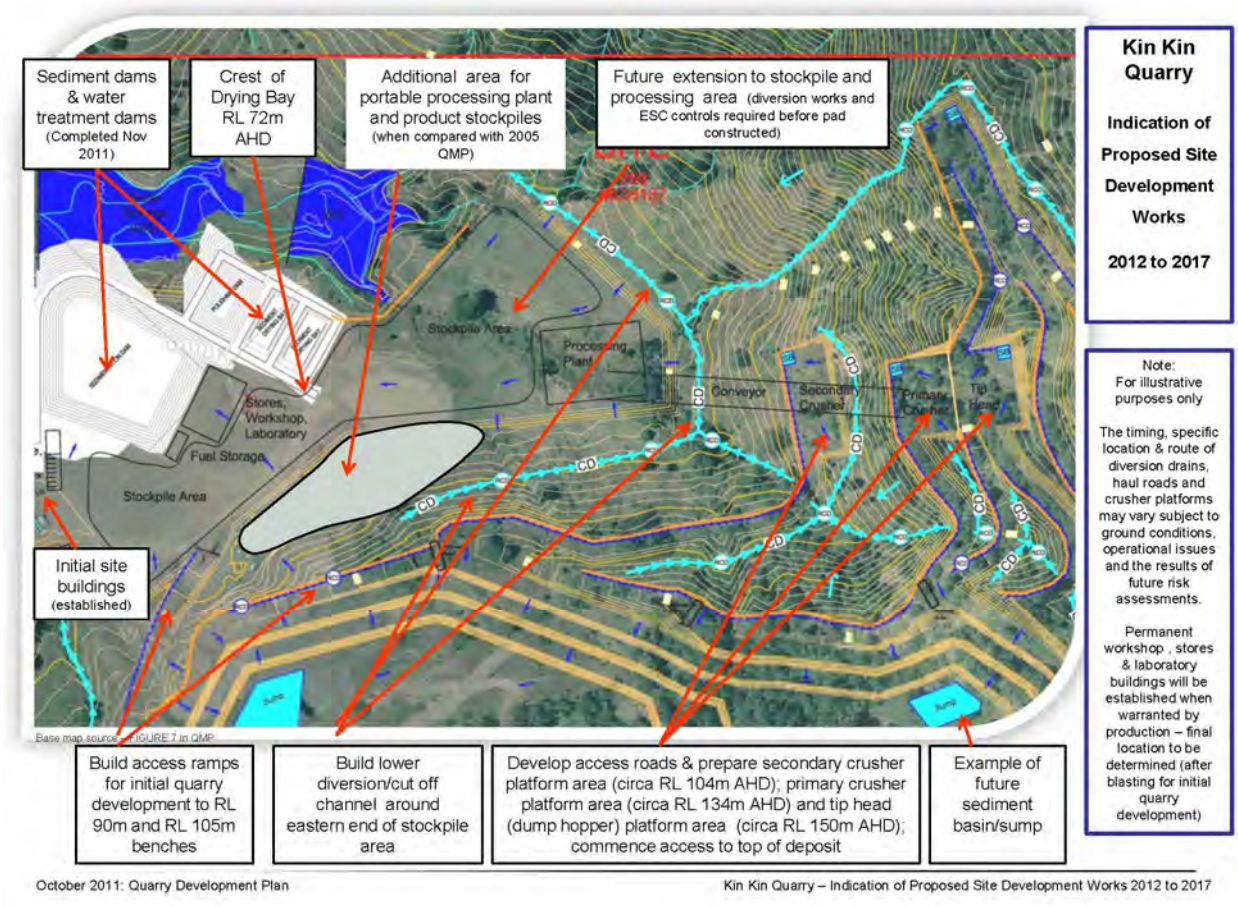


PLATE 1: INDICATION OF PROPOSED SITE DEVELOPMENT WORKS 2012 TO 2017

This purpose of the annotated plan above is to assist in communicating the ongoing development requirements for the Kin Kin Quarry. The annotated plan is not a construction drawing. It is for illustrative purposes only and as noted, the timing, specific location and route of diversion drains, haul roads, access roads and (fixed) crusher platforms may vary subject to ground conditions, operational issues and the results of (safety and environmental) risk assessments.

2.4.3 Processing Plant

The long-term location for a fixed crushing and screening plant is situated on the slope on the eastern portion of the site (refer to FIGURE 5 QUARRY LAYOUT).

The location and design of the plant has been chosen to maximise noise and dust attenuation, in addition to minimising visual impact.

Over the short-medium term (0 to 7 years), crushing and screening at the quarry will be undertaken by portable plant, which is more compact with a lower profile than fixed plant installations and it can be located lower into the hillside.

The increase in the size of the primary sediment pond to contain the runoff from a 1 in 5 year 24 hr ARI rainfall event (about 220mm of rain in a 24-hour period) has meant that the dam has 'intruded' on land previously allocated for stockpiles and for loading and truck manoeuvring.

A portable crushing and screening plant has already been used at the quarry to produce roadbase materials, drainage aggregates, gabion rock and other rock for civil site works and sediment and erosion controls. The location of this portable plant was at a nominal RL 75m AHD between the enlarged primary sediment dam and the quarry face.

Initial sourcing of quarry materials at the base of the hillside and the use of the portable processing plant beside the sediment pond on RL 75m AHD will defer the immediate need for further clearing of vegetation and land disturbance, in order to construct an access road to the top of the deposit.

Instead, this access road to the top of the deposit can be constructed in the next few years, after installation of stormwater management and sediment and erosion controls, and during drier weather periods (eg outside the 'wet season').

2.4.4 Product and Overburden Stockpiling

Processed product stockpiles will be principally located in the north of the site (refer to FIGURE 5 QUARRY LAYOUT). The height of stockpiles will be generally limited to less than 7 metres. The number of stockpiles required varies depending on material demand, quality assurance testing protocols and particular project scheduling requirements. Runoff from the stockpile pads and any stockpiled overburden or dried clay/silt fines will pass through rock-lined surface drains and sediment traps for treatment prior to leaving the site.

Water sprays may be used on stockpiles and the stockpile area to suppress the generation and propagation of dust.

2.4.5 Internal Haul Roads

The locations of the major haul roads linking the extractive areas and the rock receiving bin of the fixed crushing and screening plant are shown on FIGURE 5 QUARRY LAYOUT for the final stage of development.

The haul roads have been designed for efficient and safe operation particularly with respect to layout, geometry and type of construction.

Haul roads will be gravel paved. Two way haul roads can be up to 10m wide.

Other aspects of haul road geometry and design are as follows:

Super Elevation
Super elevation rates for curves will be appropriate for road surface conditions, curve radius, and maximum truck speeds.

Gradients
Target gradient is 1 in 10. Maximum gradient for shorter term access to benches will be 1 in 8.

Cross Slope
A cross slope of between 1 in 50 and 1 in 25 (average 1 in 40) will be adopted as a practical compromise that provides adequate drainage without incurring adverse tyre loading and driver fatigue.

Signage
Readily visible and clear signage will be provided to direct traffic.

Road Drainage
Cross slopes will generally be towards the toe of the upslope road batter to direct runoff into "v" table drains. Drains will be sized to convey predicted runoff and will be generally rock lined where gradients exceed 5%. Under road culverts with inlet and outlet erosion protection will be provided at appropriate locations such as ephemeral drainage lines and gullies.

Road Pavement
Pavement strength will reflect the high axle loadings of haul trucks. High specification crushed rock products will be used for haul road construction and regular maintenance and watering will be carried out.

The internal access road connecting the stockpile area to Sheppersons Lane will be 7 metres minimum width and the maximum gradient will be 1 in 10 (refer to FIGURE 6 SITE ACCESS ROAD). Roadworks to widen the road and flatten the longitudinal gradient to improve visibility and safety have commenced as of September 2011.

2.4.6 Site Access

Access to the site is via Sheppersons Lane and thence across Lot 258 MCH187 using the existing Quarry Access Road to Lot 259 MCH187 (refer to FIGURE 6 - SITE ACCESS ROAD).

Following negotiations between Council and Neilsens the roadworks for the widening and sealing of Shepperson's Lane are expected to commence in the first half of 2012.

Controls to manage the build-up of any tracked earth material from quarry traffic onto the sealed portion of Shepperson's Lane will be implemented and maintained by the quarry.

2.4.7 Ancillary Facilities (including Fuel Storage)

Ancillary buildings/facilities to be constructed on site include washdown / vehicle servicing concrete slab and water quality controls, office and amenities buildings, workshop (with oil and grease storage area and stores enclosure) laboratory, equipment compound, and fuel storage.

Minimum levels of infrastructure and services such as water supply, energy source, telecommunications, sediment dams and water treatment controls, haul roads , stockpile areas, portable buildings and amenities are required before commercial quarrying operations can commence. These facilities have been completed at the quarry (by end of November 2011). The location of ancillary facilities is shown on FIGURE 5 QUARRY LAYOUT.

As discussed in Section 2.4.2 Initial Quarry Development, during the next 5 or so years some permanent buildings will be established within the ancillary facilities area (stockpile area) shown on FIGURE 5 once buildings / facilities are beyond the flyrock zone of blasting and traffic safety conditions have been optimised. FIGURE 5 will be updated to reflect the as-built location of buildings and ancillary facilities.

Up till 2011, equipment at the site has been re-fuelled by a mobile fuel truck. A permanent bunded fuel storage of distillate that complies with the relevant safety and environmental standards will be introduced to the quarry in 2012.

2.4.8 Machinery and Equipment

Major machinery and equipment to be deployed on site will include crushing and screening plant and associated facilities, rubber tyred front end loaders, trucks, excavators, blast hole drilling rig(s) and water truck. Other equipment to be deployed on an 'as need' basis will include bulldozer, grader, and rock breaker. The size and/or capacity of machinery and equipment deployed on the site will be consistent with processing plant capacity.

For the initial quarry development period, estimated to run from 2012 to 2017, a mobile crushing and screening plant is expected to be used.

2.4.9 Water Storage

Adequate storage will be maintained on the site to ensure an essentially fail-safe water supply for various uses, particularly dust suppression and product moisture content. The location of water storages is shown on FIGURE 5 QUARRY LAYOUT.

The primary sediment pond has some allocated storage compartment for water for site use, such as dust suppression, product moisture and cleaning. Details of the stormwater management controls, water storage, treatment and recycling are set out in section 3.6 of this QMP.

Water Consumption

Potable Water
Water for drinking and amenity purposes will be collected from the roofs of buildings erected on the site and/or imported to the site as necessary.

Non Potable Water
Water for dust suppression on haul/access roads, quarry benches, and stockpile/hard stand areas; truck washdown, wheel/underbody cleaning, and load dampening; dust suppression at the crushing/screening plant and of stockpiles; product moisture; rehabilitation works; fire fighting; and other uses will be provided from water storages on site.

2.5 Extractive Operations

2.5.1 General

Quarrying involves the removal, haulage, processing, stockpiling, and distribution of rock products. Planning a site for quarrying must take account of geological, environmental, and engineering parameters to permit a logical, sequential, and acceptable development to take place. Rehabilitation and post quarry land use options must also be considered in planning and developing a quarry.

Extractive operations describe the sequence of activities or events involving winning the rock and other materials from the ground and transporting it to the crushing and screening plant for processing. The principal activities are described in Sections 2.5.2 - Topsoil and Overburden Removal and Storage, 2.5.3 - Face and Bench Development, and 2.5.4 - Raw Materials Handling. Section 2.5.5 describes the Sequence of Extraction and extent of the operation.

2.5.2 Topsoil and Overburden Removal and Storage

Prior to topsoil and overburden stripping, vegetation will be progressively cleared. Topsoil and overburden will be removed with an excavator, bulldozer, or similar earthmoving equipment.

Topsoil refers to that part of the soil horizon at or near the ground surface with some accumulation of humified organic matter. This horizon is referred to as the A-horizon. Topsoil development over the proposed extractive and plant/stockpile areas is generally limited to a thickness of between 0 and 300mm.

Topsoil will be stripped separately and any material not used immediately for rehabilitation works will be stockpiled for subsequent use. Sufficient topsoil will be retained on site for rehabilitation purposes.

Topsoil stockpiles will be to a maximum height of approximately 3.0 metres, and stabilised, revegetated, and generally treated so that the soil will remain in a productive condition for later rehabilitation use. Topsoil management and the location of topsoil stockpiles is discussed in the Environmental Management Plan.

Topsoil quantities from the site will be sufficient for rehabilitation of the quarry terminal faces/benches and plant/stockpile area.

Overburden, consisting of clay and weathered rock will be disposed of by selling, blending, spoiling, and use in ancillary works.

In the initial stage of quarry development, overburden will be used in the construction of the plant and stockpile area and in the construction of the major haul roads. Overburden, in conjunction with topsoil, will also be used for rehabilitation of terminal faces/benches throughout the life of the quarry.

Forward stripping of overburden will only be carried out to the extent necessary to avoid contamination of quarry rock and to provide continuity of rock extraction. Overburden removals at any one time will be generally limited to that necessary to provide for 12 months extraction of quarry rock. Overburden stripping will be carried out on a campaign basis as required and is strictly weather dependent.

Overburden (weathered bedrock) thickness varies across the extractive area ranging from 5 to 15 metres. Measures which will be employed to control erosion of stripped areas and spoil stockpiles are detailed in the Environmental Management Plan. Measures for the control of noise and dust during stripping and storage operations are also detailed in the Environmental Management Plan.

2.5.3 Face and Bench Development

After topsoil and overburden removal, quarry benches will be developed in hard rock by drilling and blasting. A bench height of 15 metres is proposed. Drilling will be carried out with modern hydraulic percussion rigs fitted with effective exhaust mufflers and dust suppression equipment.

The design, loading, initiating and monitoring of all blasting activities at the quarry will be undertaken by experienced and mines department accredited shotfirers. Each blast will be individually designed to maximise blast efficiency and control flyrock, ground vibration, and airblast overpressure. Several blasts have already been conducted at the site to produce rock for site works.

Monitoring for ground vibration and airblast overpressure is carried out for each production blast. Monitoring will be supplemented with video recording of blasts if required. Blasting practices will be modified as necessary and respond to new and evolving methods and technologies.

As part of its safety management system, the quarry has a blast management plan for the Kin Kin Quarry which is audited by Department of Mines and Energy.

The handling, storage, and use of explosives will be carried out in accordance with the blast management plan and relevant Australian Standards such as AS2187 - Explosives - Storage, Transport, and Use and the Mining and Quarrying Safety and Health Act and Regulations. Standard warning and signalling procedures will be observed as required by the Mining and Quarrying Safety and Health Act and Regulations.

2.5.4 Raw Materials Handling

Shot rock will be loaded from bench floors using rubber tyred front end loaders and/or tracked face shovel and/or hydraulic excavator onto haul trucks for transportation to the crushing and screening plant.

Haul trucks will traverse the internal haul road and associated feeders as shown on FIGURE 5 QUARRY LAYOUT. Details of the haul road are given in Section 2.4.5.

2.5.5 Sequence of Extraction

A number of development sequences and layouts have been evaluated for extracting the resources on the quarry site. The process of refinement and optimisation of quarry development is an ongoing process.

The criteria which were considered in determining the methods, layout, and sequence for developing and operating the quarry according to this Quarry Management Plan are stormwater management, slope stability, safety, water quality, blast-induced vibration, dust generation, visual amenity, land clearing, landscaping, structural geology, and efficient extractive operations.

The initial quarry development plans are discussed in Section 2.4.2 of this Quarry development plan. Once this initial quarry development including diversion drains and haul road access to the top of the deposit have been completed, the sequence of extraction from Stage 1 to Stage 4 as shown on FIGURE 4 DEVELOPMENT PLANS, can commence.

The major features of each development stage are described as follows:

STAGE 1 DEVELOPMENT

The rate of quarry development will depend primarily on market demand. Stage 1 excavation of the top benches is expected to commence in approximately 5 years. Once the access to the top of the deposit is established, topsoil and overburden stripping operations can commence, and then blasting of hard rock. The upper benches at RL 225m AHD and RL 210m AHD will be developed and extended to their southern terminal limits. This allows progressive rehabilitation and revegetation to commence (Refer FIGURES 10 to 12).

STAGES 2 AND 3 DEVELOPMENT

Upon completion of Stage 1, Stage 2 involves the development of benches from RL 195m AHD to RL 150m AHD. As for stage 1, these benches will be quarried to their terminal limits and progressively rehabilitated. Stages 2 and 3 are expected to last for 15 to 20 years.

STAGE 4 DEVELOPMENT

Stage 4 development shows the longer term development down to the bench at RL 60m AHD (Refer Stage 4 on FIGURE 4 DEVELOPMENT PLANS). FIGURE 5 QUARRY LAYOUT shows the long term development at a large scale. The proposed stormwater management plan for Stage 4 (long term development) of the site is shown in detail on FIGURES 7A-7D STORMWATER, SEDIMENT AND EROSION CONTOL PLAN.

Progressive rehabilitation can commence once the upper benches reach their final limits of extraction. The life of the quarry is expected to exceed 30 years.

2.6 Materials Processing

2.6.1 Processing Plant

Over the short to medium term (estimated at 0 to 7 years), crushing and screening at the quarry will be undertaken by portable plant, which is more compact and can be located in the lower workings and stockpile area at the base of the hillside. The location of this plant will be at nominal RL 75m AHD between the enlarged primary sediment dam and the quarry face.

As a consequence of the enlargement of the primary sediment pond, part of the stockpile area has had to be extended to the south (compared with the area shown on the 2005 QMP plans). This provides just enough space to conduct the crushing, screening and stockpiling activities. The additional area of land that is expected to be required is shown in the sketch under Section 2.4.2 of this plant (Initial Quarry Development).

The fixed processing plant will be built once the initial quarry development has been established and access to the fixed crusher platform areas and to the top of the deposit have been established. The plant will generally consist of a receiving bin, feeder, scalping screens, primary jaw crusher, surge bin, secondary cone crushers, tertiary crushers, shaping crushers, product screens, surge bin, product stockpiles, pugmill, and associated control/switch rooms. The configuration of the plant will be determined by detailed design and assessment.

The receiving bin will be enclosed on two sides. The processing plant and its enclosures will be painted bronze olive or similar sympathetic colours to blend with the open woodland backdrop. The plant will be fitted with an array of water sprays for dust control. Interconnecting conveyors may be roofed and fitted with a wind shield.

2.6.2 Products

It is not uncommon for hard rock quarries to produce up to 40 products over time. The processing plant will produce a wide range of products including, but not necessarily limited to:

- Crushed rock base and sub base pavement materials to Queensland Department of Main Roads Unbound Pavement Specification 11.05 or other required specification.
- Asphalt and sealing aggregates to Queensland Department of Main Roads or other specification.
- Concrete Aggregates to Australian Standard AS2758.1-1985 as amended.
- Ballast to Queensland Railways Specification No. CT147.
- Other products such as armour rock, crusher dust, soil aggregate road base, rip rap, shoulder materials, processed fill, and drainage materials.

Additives and other materials may be imported onto the site for blending with extracted materials to meet required specifications.

2.6.3 Production Levels

Production levels will respond to market needs and are expected to build up over a period of several years as the quarry establishes itself. Production in the range of several hundred thousand tonnes per year is expected after an initial establishment period for quarry's products, which can take several years.

As discussed the initial quarry development phase will utilise mobile crushing plant until the quarry has established itself in the local market, and demand for the product is sufficient to justify a fixed processing plant of appropriate capacity.

2.7 Product Stockpiling and Despatch

Stockpiling of processed products will be necessary to meet customer requirements and schedules and for quality control testing. However, stockpiling will be restricted to the minimum necessary.

Stockpiles will be arranged to provide ready access to different products and to provide maximum benefit for noise attenuation from fixed and mobile plant.

Product despatch will be via a weighbridge, though initially loader-based weighing scales will be used. The weighbridge will have electronic, audio and video connection to the despatch clerk and a computerised ticketing system.

Loads will be wetted down or covered. All fine material loads will be covered. No trucks will be permitted to leave the site unless the load is legal and secure. Truck types including semi tippers, truck dog combinations or body trucks, will transport the product. However, local customers will be encouraged and are expected to use a range of cartage vehicles from box trailers to medium sized heavy vehicles. A drivers' code will apply to all truck drivers and its requirements will apply to driver behaviour and attitudes both on and off the site. The primary haul route will be via the Pomona - Kin Kin Road.

2.8 Hours of Operation

Normal hours of operation:

General	
6.00am to 6.00pm	Monday to Friday
7.00am to 5.00pm	Saturday
Blasting	
9.00am to 3.00pm	Monday to Friday however if special circumstances arise to 5pm

Blasting will be conducted according to the Kin Kin Quarry's Blast Management Plan which describes the blast management practices as required by the safety inspectorate from the Mines Department.

The Blast Management Plan reflects the advice in DERM's Noise and Vibration from Blasting Guidance Note (dated 23rd March 2006). No operations will be carried out on Sundays, Easter Friday, Easter Monday, Anzac Day or Christmas Day.

2.9 Public Utilities and Services

Electricity Supply

Initially, power will be supplied by diesel generators until a power supply of 750 kVa can be installed. It is proposed to draw power requirements from the local grid by means of overhead lines to a ground transformer tentatively located in proximity to the processing plant. From that point, underground cabling would be provided to the crushing and screening plant and other facilities. The ground transformer will convert the power supply and will be secured to the requirements of Energex.

Telecommunications

The site is presently serviced by mobile phone coverage, but it can be unreliable. Persons wishing to contact Neilsens about the Kin Kin Quarry are also encouraged to phone Neilsen's main office in Brendale. It is staffed from 0700am to 0500pm Monday to Friday.

Neilsens Head Office: *Johnstone Road, Brendale*	*Phone: 07 3205 5599* *Fax: 07 3205 7521*	*For general enquiries or feedback please email:* *info@neilsens.com.au*

Reticulated Water

No reticulated water service is available to the site.

The quarry will provide for all potable and non-potable site water requirements by collection of rainwater for potable water and installation of surface water storages for non-potable water supplies. (Refer Section 2.4.9).

Other Services

Sewerage - There is no sewerage service available.

The quarry will provide an effluent disposal system consistent with other systems used in the district and in accordance with Sunshine Coast Regional Council requirements.

Waste Disposal - The proponent will collect and store domestic and other wastes from the site prior to arranging delivery to designated landfill, refuse transfer station or recycling depot.

Signage - A sign 1.8 x 1.5 metres has been placed within the property at the site entrance to provide information to the public on the nature of the operations and contact details. The reverse of the sign displays information on safe driving and instructions to drivers.

2.10 Materials Handling, Storage and Disposal

Fuels, Oils, and Grease

Distillate will be stored on site in an above self-bunded ground tank (or tanks) of up to 30 000 litres capacity. If the tank(s) is/are not self-bunded, they will be fully contained within a sealed blockwork enclosure with a holding capacity to comply with the requirements of AS1940.

Other fuels, oils and greases will be stored in a lockable workshop/storage shed of sturdy construction. Necessary bunding will be provided in accordance with AS1940.

Wastes

Paper and general wastes from the offices, workshop and amenities facilities will be stored in appropriate containers prior to delivery to designated landfill, refuse transfer station, or recycling depots.

Scrap metals will be collected by a contractor for recycling.

Oils, greases, and waste fuels from machinery servicing together with other chemical wastes will be collected and securely stored on site prior to disposal off site to licensed refuse sites or recycling agencies. Fuel, lubricant and chemical storage areas will be bunded to contain any spillages.

Chemicals

Chemicals, other than fuels, oils, and greases, which will be stored and used on the site would typically include weedicides, pesticides, paint and thinners, and fertilisers.

With the exception of welding gases, chemicals will be secured in a storage shed appropriately bunded to meet the requirements of AS1940. Welding gases will be stored in the workshop.

Explosives

Explosives will not be permanently stored on site but transported onto the site for immediate use as required.

Explosives will be transported and used in accordance with AS2187 - Explosives, Storage, Transport and Use.

2.11 Rehabilitation and Landscaping

Rehabilitation is an essential component of quarry planning and development. Good planning prior to the commencement of quarrying greatly assists in the management of environmental impacts and provides for efficient operations.

The following drawings have been prepared to illustrate the rehabilitation and landscaping activities for the quarry site:

FIGURE 9 LANDSCAPING, VEGETATION AND FENCING PLAN
FIGURE 10 LONG TERM REHABILITATION CONCEPT
FIGURE 11 BATTER TREATMENTS
FIGURE 12 PLANTING LAYOUT

Landscaping and rehabilitation will be incorporated into the day to day operations at the quarry to assist in minimising rehabilitation costs and impacts on the environment whilst maximising post extraction land use options.

The principal objectives of rehabilitation and landscaping at the proposed quarry will be:

- To reduce the potential for erosion
- To protect and enhance visual screening
- To protect the general amenity of the area both during and subsequent to extractive operations
- To ensure a safe and stable landform
- To ensure a self sustaining vegetation
- To protect and enhance the wildlife habitat of the site
- To improve and maintain habitats in buffer areas surrounding the quarry
- To ensure a sustainable post extraction land use

Rehabilitation and landscaping activities carried out on the site will be progressive and will be responsive to changing technologies and needs over the life of the quarry. The timing and extent of rehabilitation works will depend on the rate of quarrying and the staging of the quarry development.

Thus the program for implementing works will primarily depend on the rate at which terminal batters/benches are reached.

For further detail on the Rehabilitation and Landscape planning, refer to the Environmental Management Plan.

3. ENVIRONMENTAL MANAGEMENT PLAN

3.1 Introduction

3.1.1 Purpose of Environmental Management Plan

The Environmental Management Plan (EMP) is a working/management document which links the potential environmental impacts identified in various environmental studies with commitments and measures to safeguard the environment. It is the principal management tool for guiding environmental management at the quarry.

The EMP describes the levels of environmental impact to be achieved or maintained and how it is proposed to achieve or maintain the levels of impact.

The principal objectives for the Environmental Management Plan are to:

- Reflect the actual ground, quarry and environmental conditions encountered and anticipated to be encountered, to the level of knowledge available at the time of issue of the Environmental Management Plan;
- Address the requirements for a Site Based Management Plan as required in DERM's (EPA's) development approval conditions for the quarry site;
- Address the requirements for a Quarry Management Plan as required in Sunshine Coast Council's conditions of approval for the Kin Kin Quarry;
- Protect the water quality of the Wahpunga Creek catchment by ensuring any contaminated stormwater from the site is managed to protect downstream water quality;
- Reduce the potential for erosion and sedimentation;
- Protect the general amenity of the site and surrounding area both during and subsequent to extractive operations;
- Protect the acoustic environment at surrounding residences and to minimise the likelihood of complaint;
- Protect air quality of the locality and to minimise the likelihood of complaint;
- Protect visual amenity;
- Ensure that appropriate landcare is carried out to prevent the spread of weeds, loss of habitat and uncontrolled fires
- Restrict land disturbance to that which is essential for the extraction and processing of quarry materials (Refer 2011 update of Section 2.0);
- Minimise wastes generated by quarrying activities and to control disposal of waste;
- Prevent the contamination of land or water and remediate to the satisfaction of DERM any contamination which may be found on the site;
- Prepare a post extraction landform that is sustainable, stable and compatible with the site and surrounds and the planning scheme intent;
- Foster good relationships and co-operation with the local community; and
- Confirm measures to safeguard the environment are effective.

The EMP provides the framework for environmental management at the quarry and is a practical guide at the operational level to contain environmental impacts. It shows how satisfactory outcomes can be achieved. The EMP can also be described as a what, how, whom and when environmental management document.

3.1.2 Scope and Format of Environmental Management Plan

The EMP consists of a number of self contained sections to provide ready reference to information for managing the site and site activities. It comprises Environmental Impact Identification and Assessment, an Environmental Management Strategy, and Environmental Management Plans. Together, these elements form the Environmental Management System for the Kin Kin Quarry.

Environmental management is a dynamic process and needs to respond to new technologies and scientific advances. The EMP has been designed to be modified in response to monitoring results, changing circumstances (technological, economic or social), changing legislation (statutory requirements), operational experiences, design trials and community expectations.

The Environmental Management Strategy sets out the:

- Environmental Policy which provided the framework for the preparation of the EMP;
- Organisational and management structure and responsibility;
- Training requirements;
- Continuous Improvement aims; and
- Emergency and Environmental Incidents definition and response.

Environmental Management Plans have been developed for particular identified significant issues. These environmental management plans include:

- Noise Management Plan
- Stormwater Management Plan
- Air Quality Management Plan
- Rehabilitation Management Plan
- Traffic Management Plan
- Blasting Management Plan
- Landcare Management Plan
- Community Relations Management Plan
- Monitoring and Auditing Management Plan
- Waste Management Plan
- Oil, Grease, Fuel and Chemical Management Plan

Environmental Management Plans are based on a standard format (that may be adapted for a particular issue or activity) as follows:

- Rationale
- Issues, Aspects and Impacts
- Performance Targets
- Management Procedures and Practice
- Monitoring and Reporting
- Responsibility
- Corrective Actions
- Auditing and Review

3.1.3 Legislation

In Queensland, the Environmental Protection Act (EP Act) is the principal legislation for protecting the environment. The object of the Act is "to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains ecological processes on which life depends ("ecologically sustainable development")".

The Act imposes a general environmental duty on corporations, government departments, and individuals, in order to meet the primary objective. The duty relates to the notion that everyone must "take all reasonable and practicable measures to prevent or minimise harm".

The Act also requires a development proposal involving environmentally relevant activities to be assessed.

The Environmental Protection Regulation 2008, Schedule 2 classifies Extractive and screening activities as consisting of any of the following:

(a) dredging a total of 1000t or more of material from the bed of naturally occurring surface waters, in a year;

(b) extracting, other than by dredging, material from a wild river area;

(c) extracting, other than by dredging, a total of 5000t or more of material, in a year, from an area other than a wild river area;

Examples—
- extracting material for excavating a bund between existing waters and an artificial waterway being constructed on dry land
- extracting material from a dry river bed, other than the bed of tidal waters
- extracting virgin rock from a quarry

- extracting rock, that has been previously broken, from a stockpile on the site from which the rock was originally extracted

(d) screening 5000t or more of material in a year.

Further, environmental management of various activities is also controlled by various statutes, regulations, policies and local laws administered by Federal and State Governments and Local Authority organisations. These include the following:

- *Agricultural Chemicals - Distribution Control Act 1966-1983 and Regulations*
- *Environmental Protection Act 1994 and Regulations*
- *Fire Services Act 1990 and Regulations*
- *Local Authority Local Laws and Planning Policies*
- *Sustainable Planning Act 2009 and its predecessor, the Integrated Planning Act 1997*
- *Nature Conservation Act 1992 and Regulations*
- *Mining and Quarrying Safety and Health Act 1999 and Regulations*
- *Queensland Heritage Act 1992 and Regulations*
- *Water Act 2000*

3.2 Environmental Impact Identification and Assessment

The identification of activities and impacts is fundamental to designing and implementing procedures and measures proposed in the Environmental Management Plan.

Activities/processes and equipment operation have been tabulated against environmental issues to provide a focus for preparing the Environmental Management Plan. Refer to TABLE 1 - IDENTIFICATION OF ENVIRONMENTAL IMPACTS.

TABLE 1
IDENTIFICATION OF ENVIRONMENTAL IMPACTS

Issue	Noise	Air Quality	Water Quality	Flora	Fauna	Transport	Geology	Soils	Visual Amenity	Ground Vibration and Air Blast	Social and Economic Factors	Waste
Activities												
Vegetation Clearing	•	•	•	•	•			•	•		#	
Construction	•	•	•	•	•	•		•	#		•	
Topsoil Stripping	•	•	•					•				
Overburden Stripping	•	•	•				•					•
Rock Drilling	•	•	•				•					
Blasting	•	•	•	•	•		•		•	•		
Raw Material Loading	•	#										
Raw Material Hauling	•	•	•	#	#							
Raw Material Unloading	•	•	•									
Crushing and Screening	•	•	•				•					•
Product Stockpiling	•	•	•									
Product Handling	•	•	•									
Product Haulage	•	•	•	#	#	•			#		•	
Maintenance Activities	•		•									•
Handling and storage of oils, greases, fuels and chemicals			•					#				#
Light Vehicle Movements	•	•	•	#	#	•					•	
Landcare/Rehabilitation Activities	•	•	•	•	•			•	•		•	
Vegetation Enhancement			•	•	•				•		•	
Equipment												
Front End Loader	•	•	#	•	•		•	•				
Rock Drill	•	•	#				•					
Crushing and Screening Plant	•	•	#									
Excavator	•	•	#	•	•		•	•				
Miscellaneous Stationary Motors	•		#									
Rock Breaker	•	•			#		•					#
Haul Truck	•	•	#		#							
Product Delivery Trucks	•	•	#	#	#	•						
Light Vehicles	•	•	#	#	#	•						
Stormwater Discharge	#		•	•	•		•		•		•	

• Significant Issue
May be a significant issue if inappropriately managed

3.3 Environmental Management Strategy

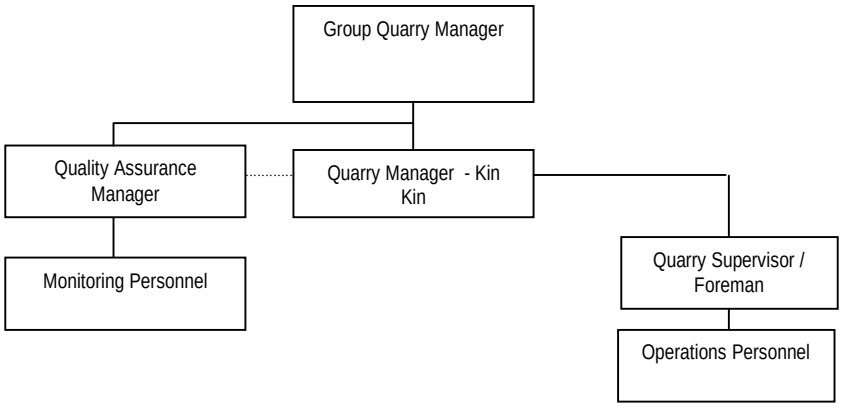
3.3.1 Environmental Policy

Neilsen Quality Gravels Pty Ltd is committed to conducting all its operations and activities in an environmentally responsible manner and to continually improve environmental performance. The company will:

- *implement work practices to protect the environment*
- *meet the requirements of all laws, acts, regulations, and standards relevant to its operations and activities*
- *make the most efficient use of natural resources taking due regard of environmental issues and provide for sustainable sequential land uses*
- *formulate and implement plans for responsible management for land under its control and establish a program for regular review and assessment and compliance against statutory requirements and design criteria*
- *implement a program to train employees in general environmental issues and individual workplace environmental responsibilities*
- *implement work procedures to ensure the health and safety of employees and the general community*
- *continually improve environmental practices to reflect changing legislation, new technology and scientific advances, experience gained from environmental incidents and increased knowledge of site specific issues*
- *allocate necessary resources to ensure the implementation of the environmental policy*

3.3.2 Organisational Structure and Responsibility

Following is a chart showing the management structure at Kin Kin Quarry.



The Quarry Manager will be directly responsible for ensuring environmental management objectives and standards are achieved for the operation. A system of regular reporting will inform the Group Quarry Manager if compliance with environmental policy is being achieved. Internal environmental audits will be carried out from time to time. Environmental consultants will be engaged to provide expert advice on particular issues or concerns.

Specific responsibilities for the Quarry Manager and other personnel are detailed in the individual Environmental Management Plans.

3.3.3 Training

Particular emphasis is placed on inducting all new employees on work place health and safety issues, emergency response procedures and company policies, including environmental policies, procedures and employee responsibilities. Environmental training will cover the following areas:

- The importance of conformance with the environmental policy and procedures and with the requirements of the environmental management system;
- The significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures.

The majority of the environmental procedures and practices training is conducted "on the job" under the guidance of suitably experienced supervisors.

Records of training, including inductions will be maintained on site.

3.3.4 Continuous Improvement

The operations at the Kin Kin Quarry will seek to undergo continuous improvement via a number of strategies such as:

- Recording, investigating and learning from environmental incidents and near misses.
- Undertaking trials of new procedures and practices, where appropriate.
- Sourcing up to date "best practice" information and advice.
- Monitoring a range of environmental factors, to provide timely feedback on environmental performance against targets.
- Engaging with stakeholders, customers and the community to ensure timely response to shifting attitudes and expectations.
- Regular Review of the Environmental Management System and Plans to ensure they remain up to date and relevant, and have been properly implemented.

3.3.5 Incidents and Emergencies

The operations at Kin Kin have been reviewed, and a list of potential emergency and environmental incidents has been prepared, and is listed below:

- Danger/ injury to personnel from quarry accidents and offsite traffic accidents
- Fire including offsite bushfire
- Hazardous substance spillage

If any employee is involved, or witnesses, any of the above incidents, the procedure to follow will be;

Alert – the Quarry Manager immediately to any of the above incidents. The quarry manager will then be responsible for co-ordinating the incident response. If you are unable to contact the quarry manager or anyone at the quarry, then ring Neilsen's Head Office in Brisbane on tel (07) 3205 5599 advising of the emergency.

Communication – the Quarry Manager will call emergency services (if required) by dialling "000". As soon as practical, the Quarry Manager must inform the General Manager or CEO of the incident. The Quarry Manager will be responsible for communication, if necessary, with the Administering Authority.

Attend *If Injury* – apply first aid to injured personnel, until professional medical aid arrives.

If Fire – attempt to fight the fire if it is safe to do so with on site fire fighting equipment. If it is not safe, then evacuate the area to the Quarry muster point.

If Hazardous Substance Spillage – Refer to the MSDS for the substance. Contain the spillage using spill kit or earthmoving equipment (as required) if it is safe to do so. Remove the spilled substance and any contaminated soil in appropriate containers to a Registered Waste Facility.

After becoming aware of any emergency or incident which results in the release of contaminants not in accordance with the conditions of any relevant development or environmental approval, the Quarry Manager must notify DERM as soon as practicable by telephone or email.

A standard form for such notification is attached (APPENDIX 1 - INITIAL NOTIFICATION FORM. Within 14 days of the incident/emergency, Neilson's Quality Gravels Pty Ltd – Kin Kin Quarry must in addition to the information provided in the initial notification form provide further information as shown in the attached form (APPENDIX 2 - FURTHER NOTIFICATION FORM).

Within six (6) weeks of the incident/emergency the written advice of the results of any environmental monitoring (not previously supplied) in relation to the incident/emergency shall be supplied to DERM.

3.3.6 Document Control

The following procedures will be implemented to maintain Document Control at the Kin Kin Quarry Site:

- All documents relating to this Environmental Management System will be dated (with revision numbers if applicable);
- All documents relating to this Environmental Management System, including monitoring records will be stored in a single location in the Quarry Office;
- The publishing of revised versions of any documents relating to this Environmental Management System will be undertaken only with the approval of the Quarry Manager.

3.4 Environmental Management Plans

Individual environmental management plans have been developed for particular identified significant issues. These plans provide management objectives, identify specific activities, performance targets/legislative requirements, management measures, monitoring requirements, reporting requirements and responsibilities, corrective actions and auditing and reviews. They should be updated from time to time to reflect contemporary standards and up to date quarry works. The plans prepared for the Kin Kin Quarry include;

3.5 Noise Management Plan
3.6 Stormwater Management Plan
3.7 Air Quality Management Plan
3.8 Rehabilitation Management Plan
3.9 Traffic Management Plan
3.10 Blasting Management Plan
3.11 Landcare Management Plan
3.12 Community Relations Management Plan
3.13 Monitoring and Auditing Management Plan
3.14 Waste Management Plan
3.15 Oil, Grease, Fuel and Chemical Management Plan

3.5 Noise Management Plan

3.5.1 Rationale

Uncontrolled or unmitigated quarry noise has the potential to be a nuisance at neighbouring residences.

The objective of the noise management plan is to protect the acoustic environment at surrounding residences and to minimise the likelihood of complaint.

3.5.2 Issues/Aspects/Impacts

The nearest noise sensitive place is located 800m north of the quarry site.

The major quarry noise sources that have potential to generate noise have been identified and include:

- crushing and screening plant (sizing and sorting of raw materials);
- front end loaders (product handling, loading, feeding,crushing and screening plant);
- off-road haul trucks (haulage of raw material to the crushing and screening plant);
- face loaders/excavators (raw product handling);
- rock drills (drilling holes in preparation for blasting);
- excavators (civil construction activities);
- road trucks (product delivery);
- light vehicles (employee vehicles, maintenance vehicles and service vehicles);
- maintenance activities;
- ancillary plant and equipment; and
- blasting.

The Blasting Management Plan deals with noise due to blasting activities.

3.5.3 Performance Targets

Operations will comply with the Environmental Protection (Noise) Policy 2008 (EPP Noise) and the conditions of the approval documents (eg Development Approval, Environmental Authority).

3.5.4 Management Procedures and Practice

The following management practices will be adopted:

- designing the layout of the quarry to maximise the use of natural barriers, earthen bunds and vegetation;
- operating and maintaining modern, well maintained roadworthy product delivery trucks fitted with high efficiency mufflers;
- avoiding the unnecessary revving of mobile or stationary motors;
- reversing beepers being replaced by broadband silenced alarms;
- implementing a site code outlining requirements for operators and drivers, including the movement of road trucks on public roads;
- maintaining haul road and hardstand surfaces in good condition (free of potholes, rills and product spillages) and with grades shown on the development plans;
- avoiding the use of engine for braking on product delivery trucks in built up areas; and
- inducting new employees on the requirements of the Noise Management Plan and Site Code.

3.5.5 Monitoring and Reporting

- Quarry Manager will initiate a noise survey following a request from an administering authority (DERM or Sunshine Coast Council) to investigate a noise complaint, providing this complaint is reasonable and not frivolous or vexatious;
- The Quarry Manager will also initiate noise monitoring/surveys as often as is necessary to check compliance with the performance targets;
- The Quarry Manager will ensure that earthen bunds, enclosures and buffer land vegetation are maintained; and
- The Quarry Manager will maintain records of any noise monitoring or surveys undertaken.

3.5.6 Responsibility

- All complaints received at the quarry will be recorded in the complaints register. The Quarry Manager will investigate complaints and take actions in accordance with the complaints handling protocol (refer Section 3.12).

3.5.7 Corrective Actions

- The Quarry Manager is to personally meet with any person making a complaint and to resolve issues raised by the complainant. Quarry Manager may request the services of a specialist consultant to investigate the noise issues if required.
- Specialist consultants might be required to give advice on noise control devices that should be implemented at the quarry, to prevent environmental nuisance.
- The Quarry Manager is to undertake appropriate action to reduce the identified noise source and ensure the performance criteria is achieved.

3.5.8 Auditing and Review

- Quarry Manager (or consultant) will retain and review monitoring undertaken in the preceding 12 months, compare the monitoring results against relevant legislative requirements, licence conditions and nominated performance targets, and review changes to the extraction or processing activities employed at the site and any complaints received and actions taken.

3.6 Water Quality Management Plan (Stormwater Management)

3.6.1 Rationale

This plant focuses on matters associated with water quality, treatment methodologies and water quality monitoring, to ensure compliance with the Environmental Protection (Water) Policy 2009, Environmental Values (EVs), Water Quality Objectives (WQOs) and the salient legislation and guidelines. The terminology used in this report is in accordance with the Institute of Engineers Guidelines 1987 (updated 2006) for Australian Rainfall and Runoff, and also the more recent publication Best Practice Erosion and Sediment Control, International Erosion Control Association 2008. Both documents being endorsed by the former EPA.

The Water Management Plan, (WMP), is designed in an attempt to manage the quantum and quality of water on site. The preparation of the WMP has involved a review of existing data and topography, as well as consideration of the extraction and rehabilitation plans. This review has assisted in providing a determination on the appropriateness of various control mechanisms and nomination of practical and effective controls as necessary to provide for acceptable water quality. The WMP is also appropriate to the topographic and climatic setting of the site and developed to comply with relevant approval and operating conditions.

Stormwater runoff from disturbed areas has the potential to pollute downstream waters.
The principal objectives of the Water Quality Management Plan:

- to ensure all water including stormwater is managed to protect downstream water quality.

The Water Quality Management Plan has been prepared having regard to the hierarchy of controls often summarised as Avoid (eg by design) → Minimise→ Recycle→ Treat→ Release

This management plan will describe the approach and methods to control stormwater runoff and site drainage, minimise erosion and contain and treat sediment-laden waters occurring as a result of land disturbance necessary for extractive and ancillary operations. The plan covers the management of surface water at the quarry. Sediment and Erosion control for the site is discussed separately in a report prepared by 02 environmental and is attached as APPENDIX 5.

3.6.2 Issues/Aspects/Impacts

The quarry is located above the headwaters of Wahpunga Creek, which flows into Kin Kin Creek. Kin Kin Creek is part of the Kin Kin / Lake Cootharaba sub-catchment of the Noosa River Catchment area.

Activities resulting in land disturbance have the potential to impact on runoff water quality. These activities include:

- vegetation clearing;
- topsoil stripping;
- overburden removals;
- quarry bench development;
- construction and maintenance of unsealed roads and hardstands;
- stockpiling of topsoil, raw feed and quarry products;
- spillage during handling of materials; and
- use and storage of oils, greases, fuels and other chemicals.

At the quarry site, the steep terrain and soil/overburden profile means that in wet weather the risk of exposure of soil or clay materials and contamination with stormwater is higher. Management of water quality is an important issue for the quarry site.

To reduce the initial area of disturbance, the lower workings will be developed over an estimated period of 5 years before the upper levels of the quarry will be accessed and prepared for quarrying. This will require diversion of stormwater, establishment of haul road access and integration of the quarrying works into the stormwater and management controls for the site.

In the steeper portions of the site, slope instability (slump) features are evident. Accordingly, slope stability is an important determinant in the timing of extraction works and development of future quarry infrastructure – for environmental and safety reasons, works that expose the clay soils and overburden of the site should, where ever possible, be confined to dryer periods when the soil is not saturated.

3.6.3 Performance Targets

The water quality monitoring program and performance targets have been devised having regard to:

- The Environmental Protection (Water) Policy 2009 and the Noosa River Environmental Values and Water Quality Objectives for Kin Kin Creek / Cootharaba sub-catchment;
- ANZECC 2000 Aquatic Ecosystem Protection (95 per cent of species);
- The Queensland Water Quality Guidelines (2009) for the South East Queensland sub-region;
- The water quality parameters set out in the Environmental Protection Order issued to Neilsens Quality Gravels Pty Ltd (17/2/11).

The water released from the site will comply with the Department of Environment and Heritage Protection permit conditions.

3.6.4 Management Procedures and Practice

Management practices and procedures are described below (using the hierarchy of stormwater management controls) as a framework.

Overview According to Hierarchy of Controls

Avoid, Minimise and Divert

To minimise the area of disturbed area at the commencement of operations, the quarry will be worked initially from the bottom over several benches. These are the original workings commenced by Noosa Shire Council.

The benches are located at nominal 15m vertical intervals in Australian Height Datum (AHD) at RL 75m, RL 90m, RL 105m and RL 120m. Stormwater diversion drains have been established at RL 130 to 140m AHD to intercept stormwater and divert it before it enters the quarry workings below.

The initial bottom up extraction method has been adopted to reduce the area of disturbed land necessary during the initial development of the quarry. It avoids the need to build an extended haul road access to the top of the deposit at the outset of quarrying. This is particularly relevant during wetter periods and saturated ground conditions to minimise erosion and slope instability and reduce the amount of stormwater that requires containment and treatment before release.

Contain, Re-Use, Treat and Discharge

Stormwater runoff from the quarry workings including open cut pit operations, overburden stockpiles, haul roads, and hardstand areas is directed to the large primary sediment pond via coarse sediment traps and rock-lined surface drains.

The water is stored here for re-use around the site, or if excess to requirements, is treated in a secondary dam to remove excess clay and silt fines. This involves the mixing of a small quantity of coagulant to accelerate the settling of clay particles. After treatment the water is discharged to the existing western drainage gully. Settled clay and silt fines will be pumped from the bottom of the polishing dam and stored in two storage cells constructed beside the secondary dam, allowed to dry, and blended with roadbase material.

The primary dam has a capacity of approximately 28 ML. This provides for a storage compartment of 19 ML for the containment of stormwater flowing from disturbed areas of the quarry site and 9 ML for water storage compartment (for use in dust suppression and product moisture etc). As quarrying operations are developed higher up the hillside, diversion

drains and additional sediment traps and sumps will be constructed to service the immediate workings. These are shown on FIGURES 7A-7D STORMWATER, SEDIMENT AND EROSION CONTOL PLAN.

The primary dam will receive stormwater run-off contaminated with clay/silt. Coarser sediments will settle in the large primary pond. Where ever practical, this water will be recycled for use in quarrying operations.

Contained water that is excess to requirements (i.e. once the 'live' capacity in the primary pond falls below 19ML), will be treated with an environmentally innocuous coagulant or flocculant, and the treated water allowed to settle in a secondary pond or 'polishing' basin. The treated water is then discharged from the top of the secondary dam, into the eastern drainage line and exits from the site. The flocculated clay and silt is removed from the polishing dam and stored and dried in the sediment drying bays and recycled for use in roadbase.

At present water discharged from the site flows through a marshy area and into the drainage line that exits the site to the north. Future water supply dams are proposed to be built towards the downstream end of this eastern drainage line. The lower dam (if required) will be constructed so that it does not compromise the structural integrity of the already constructed primary sediment dam.

Specific stormwater management and sediment and erosion control measures for the Kin Kin Quarry are described below.

Design and Construction of Runoff Conveyancing Structures

These structures include the diversion drains to be constructed above quarry workings to divert uncontaminated stormwater away from exposed soil and rock . Management measures and the criteria for the design and construction of runoff conveyancing structures will include:

- designing diversion drains and catch drains to pass at least the 10 year Average Recurrence Interval (ARI) peak runoff, with a minimum of 150mm freeboard(2) and to ensure that the 2 year ARI peak flow is non-eroding for the particular channel lining(2);
- installing a permanent table drain adjacent to internal access roads;
- installing check dams (maximum height of approximately 500mm(2)) in table drains adjacent to internal access roads and or rock filters (height of approximately 1.5m(2)) in catch drains downslope of settling ponds;
- constructing quarry benches and plant and stockpile pads with minimum slopes of 1 in 100 to facilitate drainage into sediment basins and ultimately into settling ponds;
- constructing haul roads with a crossfall of approximately 1 in 30 to direct runoff from the road surface into "V shaped" table drains;
- riprapping (rock diameter D50% passing = 40 x (velocity of flow)2 (2)) or grassing (vetiver grass, couch, rhodes grass) drains where necessary to prevent erosion. Riprapping will be used when the design water velocity in a drain exceeds 2.0 m/s;
- designing rock chutes to pass at least the 10 year Average Recurrence Interval (ARI);
- installing rock chutes where runoff is directed over high steep slopes and runoff velocity is greater than 2.0 m/s;
- designing under road culverts to pass at least the 10 year ARI peak runoff;
- installing under road culverts where appropriate;
- ensuring channelled runoff from disturbed areas is directed to sediment basins and settling ponds for treatment; and

(2) The Institution of Engineers, Australia, Queensland Division (1996): *Soil Erosion and Sediment Control: Engineering Guidelines for Queensland Construction Sites.* Prepared by Grant Witheridge, Griffith University and Robert Walker, University of Southern Queensland.

- the spillway for the primary detention basin is designed to be stable in the peak flow from at least the 10 year ARI time of concentration.

Erosion Control Measures

The general location of stormwater management structures/devices for development of the Kin Kin Quarry are shown FIGURES 7A-7D STORMWATER, SEDIMENT AND EROSION CONTOL PLAN.

Erosion control measures installed at the site, or to be installed as part of the development of quarrying operations, include;

- scheduling and timing of construction works to avoid the wet season period;
- installing and maintaining temporary erosion and sediment controls during construction;
- limiting forward clearing and overburden removals at any one time to that necessary to provide for 12 months production of quarry rock;
- directing runoff from disturbed areas via stormwater drains to sedimentation basins and settling ponds, as indicated on FIGURES 7A-7D STORMWATER, SEDIMENT AND EROSION CONTOL PLAN;
- stabilising and vegetating road embankments and batters, temporary overburden and topsoil stockpiles and amenity bunds;
- rip-rapping and grassing permanent table and catch drains to prevent scouring;
- installing sediment basins down slope of disturbed catchments;
- restricting mobile equipment and vehicles to defined road ways;
- installing check dams, rock/gravel filters and other erosion protection devices in water conveyancing structures;
- reviewing stormwater management requirements prior to developing new benches;
- inducting and training staff on the requirements of the Stormwater and Erosion and Sediment Management Plan; and
- carrying out progressive rehabilitation. Rehabilitation of available terminal faces/benches will be commenced within 6 months of relevant extraction limits being attained (provided favourable weather conditions prevail).

Seepage and Groundwater management for the pit

Measures for the management of groundwater seepage and pit water include:

- containment of any groundwater seepage and pit water, within the pit workings and adoption of the hierarchy of controls to manage this water contained water;
- sump/s to be installed as required at appropriate locations in quarry benches;
- ensure all water pumped from quarry sump is treated to remove contaminants prior to release.

Design and Construction of Primary Sediment Basins

Management measures and the criteria for the design and construction of sediment basins include:

- Sediment basins to treat water for a 24hour duration, 5 year ARI storm (which produces an estimated 223mm rainfall during this period);
- Water collected in primary sediment basins to be used for dust suppression, product moisture, irrigation of rehabilitated areas or as wash down water , and so increase the free storage capacity for succeeding rainfall events;
- Primary sediment basin to be inspected annually and desilted as necessary to maintain design capacity;
- Secondary settling ponds will be cleaned out when 10% of the total storage volume is lost through sediment build-up;
- Sediment removed from ponds to be stored in isolated, bunded cells or similar structure, and dried to the condition where it can be handled for use as a binder in roadbase.

The primary sediment control dam has the following specifications:

Total Capacity	28.6ML
Storage compartment for 1 in 5 year 24 hr rainfall event	19.2 ML ("live storage" above RL 66.5m, to spillway)
Storage compartment available for water storage	9.4 ML

The storage compartment to contain the 1 in 5 year 24 hr rainfall event is based on a catchment area of 8.6ha (being the area of the quarry catchment below the stormwater diversion channels, presently constructed at RL 130m – 140m AHD) . The necessary storage capacity of the primary sediment dam of 20 ML is to be marked on the dam.

As the quarry is developed and the disturbed footprint is expanded beyond this initial quarry development area, additional sediment and erosion controls will be installed, including sumps where contaminated stormwater can be treated. As the quarry matures, sediment dams and sumps will be constructed within the quarry workings so that stormwater is contained and treated as quarry works progress.

Other Pollution Control Structures

Management measures for other pollution control structures will include:

- Bunding and/or securing of fuel, oil, grease, and other chemical storage facilities to prevent accidental spillage polluting runoff;
- Designing and constructing compounds or bunded areas with holding capacities to conform to the appropriate regulatory requirement applicable to each material type;
- Providing facilities for machinery and truck underbody and vehicle washdown; and
- Installing interceptor traps/oil separators to remove oils and greases. Water from the truck washdown facility and workshop will pass through interceptor traps/oil separators prior to its reuse or release.

For the first year or two of commercial production routine maintenance of plant and equipment only, will be conducted at the quarry. All wastes will be removed from site. For any major breakdowns, in this start-up period any major breakdowns of machinery will be repaired off site. During this period, a washdown slab serviced by an interceptor/oil separator will be installed for later on-site plant, equipment and machinery repairs.

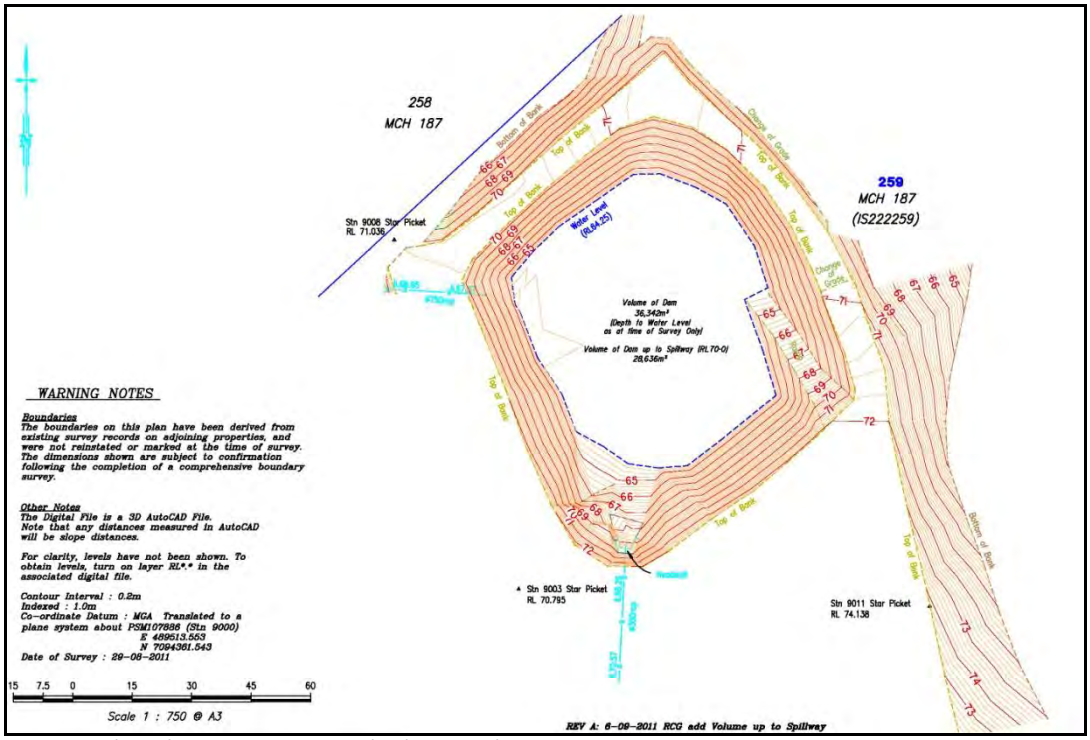
Sediment Disposal

Management measures for sediment disposal will include:

- Using flocculating or coagulating agents to assist in the settling of suspended solids;
- Regular cleaning of sediment from sediment basins by tracked excavator or other appropriate methods;

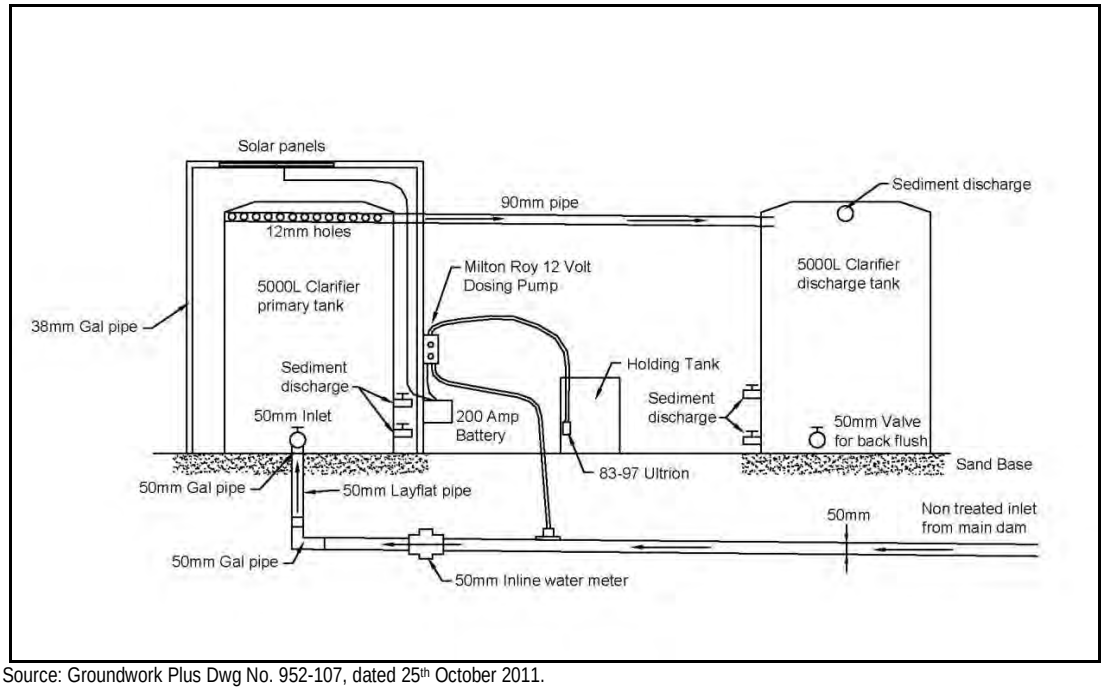
- Constructing shallow elevated basins to accept sediment for drying;
- Other coagulating or flocculating/dewatering contingencies for clay/silt removal from stormwater;
- Diverting runoff away from drying basins by perimeter drains or bunds; and
- Disposing of dried material by incorporation into products for sale offsite, or for use in site rehabilitation works.

A plan of the 'as-built 'primary dam is shown overleaf and a schematic layout of the coagulant dosing plant for removal of excess clay/silt fines from stormwater.



Source: RPS Plan Reference No. 103999-11A dated 5th September 2011.

Plan of As-Built Primary Sediment Dam



Source: Groundwork Plus Dwg No. 952-107, dated 25th October 2011.

Coagulant Dosing Plant

3.6.5 Monitoring and Reporting

The Quarry Manager will regularly inspect the quarry, buffer land and access road for erosion, damage, failures or slumping especially after major rainfall events. The quarry manager will also inspect diversion drains, other drains, rock chutes, sediment basins, settling ponds and water storages.

The Quarry Manager will arrange for monitoring of the water exiting the site and where practical, upstream of the site, according to the program described below. Water monitoring locations are indicated on FIGURE 8 MONITORING LOCATIONS.

The objective of the water monitoring program is to demonstrate compliance with development approval conditions relating to water quality for the site.

Monitoring of surface waters flowing from site will be conducted during a rainfall discharge event on a monthly basis from at least the following monitoring locations:

1. Water release point (DS2) via Rising Stage Sampler
2. Upstream water quality of receiving environment (US1) via Rising Stage Sampler
3. Spillway Release via Rising Stage Bottle; and
4. Downstream water quality (DS3) Grab Sample

The monitoring frequency will be re-assessed annually. If there are no rainfall discharge events in the monitoring period and no flow, it will be recorded as “dry” and no testing is required. Sampling at points US 2 and US 3, will be conducted at least annually to maintain testing of background waters.

The locations of the monitoring points are shown on FIGURE 8: MONITORING LOCATIONS.

Water samples shall be collected, under supervision from consultants or from a competent and appropriately trained quarry employee, from the nominated monitoring locations as soon as is practical.

Following treatment of water to remove excess clay/silt fines and prior to each controlled discharge event, the treated water (Point of Discharge 1) and un-treated water (Sediment Pond 1) will be sampled by a competent person and the water sample analysed by a NATA-accredited laboratory for turbidity and total suspended solids, and other parameters as recommended by the consultant.

As water monitoring data is compiled, a site-specific relationship between turbidity and total suspended solids will be developed so that field testing can be usefully applied to assist site management in operational decisions.

The water quality consultant or other competent person shall prepare a report within a month following receipt of laboratory results. The report will detail monitoring results (tabulated), any relevant field observations and certificates of analysis. Results will be compared to the nominated WQO's.

Other water quality indicators and elements may be tested from time to time depending on the advice and recommendations from the water quality consultant.

The quarry will also conduct internal trials and testing from time to time to assess and improve the efficacy of its coagulant dosing regime to remove colloidal clays from contaminated stormwater.

3.6.6 Responsibility

- All water quality complaints received at the quarry will be recorded in the complaints register. The Quarry Manager will investigate complaints and take actions in accordance with the complaints handling protocol.
- The Quarry Manager will allow an administering authority (DERM or Sunshine Coast Regional Council) to visually inspect the complaints register on request.
- Any results of monitoring will be summarised the operator's daily diary, kept at the site office.
- The Quarry Manager will be responsible for ensuring that drains and other sediment and erosion controls are kept free of clay/silt build-up which can impact on runoff water quality.

3.6.7 Corrective Actions

- The Quarry Manager is to personally meet with any person making a complaint and to resolve issues raised by the complainant. Additional water monitoring will be undertaken following reasonable and relevant complaints if requested by the administering authority, or upon the advice of the water quality consultant.
- The Quarry Manager will ensure that the settling ponds and sediment basins are desilted before10% of the total storage volume is lost through sediment buildup;
- Specialist consultants might be required to give advice on additional stormwater control devices that should be installed at the quarry to supplement existing control devices.
- The Quarry Manager will inspect stormwater management devices and instigate maintenance activities where required.
- The Quarry Manager will ensure that drainage, erosion and sediment controls are installed in newly disturbed areas.

3.6.8 Auditing and Review

- Quarry Manager (or consultant) will review the results of the water monitoring tests and summarise monitoring undertaken in the preceding 12 months, compare the monitoring results against relevant legislative requirements, licence conditions and nominated performance targets.
- The Quarry Manager will in advance of any works review the location of any water quality monitoring stations that could be impacted by future quarrying or ancillary works. If there is a likelihood , the Quarry Manager will ensure that DERM and Sunshine Coast Council are notified of the reasons for the change and when any new station would be established. An example of this would be the re-location of monitoring station US 1 when the permanent diversion drain was established.

- The Quarry Manager will review changes to the extraction or processing activities employed at the site and prior to construction works commencing (for another stage of the quarry for example) ensure that drainage, erosion and sediment controls are installed.
- Conceptual and detailed stormwater management plans will be prepared and submitted to Council for approval and EHP prior to works commencing in those stages.
- Within twenty business days, the quarry manager will make available to Council upon request, the results of water monitoring tests, which have completed over the proceeding six months.

3.7 Air Quality Management Plan

3.7.1 Rationale

Activities on the quarry site will generate dust and minor exhaust emissions and if not adequately controlled has the potential to be a nuisance at the nearest residences.

The objective of the air quality management plan is to protect air quality of the locality and to minimise the likelihood of complaint.

3.7.2 Issues/Aspects/Impacts

Quarry activities at the site which have the potential to impact on air quality of the locality include;

- crushing and screening operations (openings at bins and chutes, crusher openings, screening operations, material transfer points conveyor product stockpiling);
- wind action on conveyors, stockpiles and disturbed areas;
- drilling and blasting (air flushing of drill holes, drill cuttings piles, blasting activities);
- topsoil/overburden stripping, rock extraction and transportation (earthmoving machinery ground interaction, materials digging, loading, and dumping, haul truck tyre/unsealed road interaction, unsealed roads, bench and face areas, material spillage from haul trucks); and
- product stockpiling and dispatch (stockpiles and stockpile pads, product loading, truck type/road interaction, material spillage from trucks).

Dust generation rates depend upon a number of factors including:

- type of material;
- particle size distribution, moisture content, and method of storage/stockpiling;
- crust formation on surface of stored/stockpiled materials;
- prevailing meteorological conditions;
- methods of operation and materials handling; and
- implementation of specific control measures.

3.7.3 Performance Targets

Performance targets are set out under the “Air” conditions 1 to 5 of EPA Permit IPDE00324405A11 and are summarised as follows:

- Dust deposition at property boundaries not to exceed 120 mg/m2/day when monitored in accordance with AS 3580.10.1 of 2003.
- Maximum 24 hour average PM10 concentration at near residences not to exceed 150 µg/m3over a 24-hr averaging time.

The Environmental Protection (Air) Policy 2008 (EPP (Air)) provides a statutory basis for the establishment of guidelines for ambient air quality and technology-based standards for point source emissions, identification of environmental values and the guidelines to protect them and provision of frameworks for managing environmental impacts.

The objective of the EPP (Air) is to protect Queensland's air quality and to protect environmental values and wellbeing of humans.

3.7.4 Management Procedures and Practice

The identification of potential sources of dust emission from the site has facilitated the nomination and design of measures for the control of dust.

An adequate water supply forms one of the principal cornerstones for dust control at the site. Specific control measures to be implemented for particular operational phases or activities include, but not necessarily limited to:

Construction and Commissioning Phase

- Dampening of cleared areas including access roads and work areas.
- Restricting vehicle movements to designated roads, and site clearing and earthworks will be restricted to that which is absolutely necessary.

This phase will also involve the construction of facilities and works and installation of systems which will be necessary for subsequent effective operational dust control. These facilities/works include:

- Constructing water storages and settling ponds for site runoff containment.
- Constructing and sealing of the site access road according to Council requirements.
- Installing water reticulation systems to the plant.
- Locating the portable processing plant in the northern section of the site at a nominal RL of 75m AHD.

Extractive Operations

Control measures which will be implemented as part of the extractive operation will include:

- Limiting topsoil/overburden removals at any one time to that necessary whilst providing for effective production of quarry rock.
- Limiting removal of topsoil/overburden to periods of favourable weather conditions or maintaining materials in a damp state to avoid dust generation and propagation.
- Undertaking progressive rehabilitation during the life of the operation. Rehabilitation of available terminal faces/benches will be commenced within 6 months of relevant extraction limits being attained.
- Designing blasts to prevent venting of gases. The design will provide for adequate stemming length and use of granular stemming materials to minimise dust generation.
- Fitting and maintaining effective dust collectors to blast hole drilling rigs.

- Dampening down of quarry working areas, haul roads and other hardstand areas by water spraying when visual surveillance indicates excessive dust generation and propagation from point or mobile sources.
- Enforcing a 40 kph maximum speed limit on haul and access roads to minimise dust generation.
- Directing exhaust emissions from mobile plant away from the ground.
- Restricting mobile machinery movements to designated routes and standing areas.

Materials Processing Operations

Crushing, screening, and conveying operations constitute the most significant potential dust sources in a quarry operation. Control measures that could be implemented at the site include:

- Fitting of water sprays to control dust emissions
- Provision of a wind shield and cover to conveyors

Product Stockpiling and Despatch

The dust control measures to be adopted for stockpiling, loading, and product transportation activities could include:

- Tarping all loads of material (other than rip rap and similar materials)
- Clearing of spillage from side rails, tail gates and draw bars of trucks
- Levelling of loads prior to truck exit from the site to avoid spillage
- Maintaining the access road

General Activities

Miscellaneous dust control measures will include:

- Dampening of haul and access roads, loading areas and stockpile areas
- Constructing water storages/settling ponds for a fail safe water supply
- Planting tree and shrub screens and constructing amenity banks
- Stabilising and revegetating of topsoil, and overburden stockpiles
- Maintaining road surfaces in good condition
- Maintaining vegetated buffers between operational areas and site boundaries
- Limiting vegetation clearing to that which is absolutely necessary
- Implementing rehabilitation, revegetation, and vegetation enhancement programs for the site
- Surveillance of control measures to ensure system performance accords with design and implementation criteria.

3.7.5 Monitoring and Reporting

- If visible dust is observed traversing the site boundaries, dust deposition gauges will be installed and maintained for one year after which the need for, scope and duration of further monitoring would be evaluated.
- The recommended dust monitoring (deposition gauges) locations are shown on FIGURE 8 MONITORING LOCATIONS.

- Air quality monitoring in accordance with AS3580.09.63 will be undertaken to investigate a complaint of dust-related health impact, upon receipt of request from an administering authority (DERM or Sunshine Coast Regional Council).
- The Quarry Manager will initiate further dust monitoring as often as is necessary to check compliance with performance targets.
- All quarry employees will be responsible for visual surveillance of dust emissions. Excessive dust generated will be reported to the Quarry Manager who will give instruction on actions to be taken.

3.7.6 Responsibility

- All complaints received at the quarry will be recorded in the complaints register. The Quarry Manager will investigate complaints and take actions in accordance with the complaints handling procedure.
- The Quarry Manager will allow an administering authority (DERM or Sunshine Coast Regional Council) to visually inspect the complaints register on request.
- The Quarry Manager will be responsible for ensuring that dust suppression equipment is maintained and is in good working order.
- The Quarry Manager will report any actions or dust observations in the operators daily diary.

3.7.7 Corrective Actions

- The Quarry Manager is to personally meet with any person making a complaint and to resolve issues raised by the complainant in accordance with the complaints handling protocol.
- Specialist consultants might be required to give advice on further dust control measures which should be implemented at the quarry if dust generated by the quarry is unacceptable.
- During unfavourable weather conditions, the Quarry Manager will schedule activities and implement controls to prevent dust nuisances.
- The Quarry Manager will give instruction on actions to be taken if excessive dust is generated.

3.7.8 Auditing and Review

- Quarry Manager (or consultant) will compile and summarise monitoring undertaken in the preceding 12 months, compare the monitoring results against relevant legislative requirements, licence conditions and nominated performance targets, and review changes to the extraction or processing activities employed at the site and any complaints received and actions taken.

(3) AS3580.9.6 (2003):
Ambient Air Particulate *matter: Determination of suspended particulate PM10 - Gravimetric Method.* Australian Standards.

3.8 Landscape Master Plan including Rehabilitation Management Plan

3.8.1 Rationale

The Landscape Master Plan, which incorporates the rehabilitation management plan, is designed primarily to integrate floristic and structural elements of the rehabilitation works with the surrounding undisturbed or ecologically restored areas of vegetation. This plan is prepared with cognisance of the PSP03 Noosa Planning Scheme Policy 3 Landscaping Plants & Guidelines.

Activities on the quarry site will modify the landscape, cause land disturbance and have the potential to impact on the visual amenity, flora and fauna of the site and surrounding environment. The implementation of control measures will ensure that the visual amenity of the locality is protected and the vegetation communities and habitats are managed appropriately during and subsequent to the operations. For landscape mater planning works the current vegetation is considered a mix of Woodland/Open Forest and Closed Forest/Rainforest areas.

Successful landscape design can achieve a favourable setting for buildings and enhance the environment and ambience for both residents and neighbourhoods. Accordingly the landscape design proposed has taken into consideration existing site conditions which include:

- Existing vegetation;
- Aspect;
- Soil type and conditions;
- Pedestrian and vehicular circulation / access;
- Shade and sunlight; and
- Operational and utility areas.

Other influences which impact upon the utility of the landscape master plan at Kin Kin are:

- Character of the surrounding neighbourhood;
- Existing vegetation;
- Desirable and undesirable views;
- Outlooks from neighbouring locations or sensitive areas;
- Noise sources such as the primary crusher and screening plants; and
- Connectivity within the locality.

Rehabilitation works will be guided by the proposed post extraction land use and in some instances (particularly where the life of the project is long term), this may not be decided until closer to the end of life of the operation.

The principal objectives of the Landscape Master Plan are to:

- return the land to a stable, non polluting and self sustaining state, compatible with the site and surrounds;
- integrate floristic and structural elements of the rehabilitation works with the surrounding undisturbed or ecologically restored areas of vegetation;
- maximise the area of land returned to rural land uses or nominated sustainable sequential land uses;
- restriction of land disturbance to that which is essential for the extraction and processing of quarry materials;
- provide visual screening;
- protect visual amenity;

- reduce the potential for erosion;
- protect the general amenity of the area both during and subsequent to extractive operations;
- promotion of local provenance plant species regeneration on banks and batters; and
- minimisation of long term site maintenance costs.

3.8.2 Issues/Aspects/Impacts

Extractive industry operations, by their very nature, cause land disturbance and modification of the landscape. Particular quarry activities at the site, which have the potential to modify the landscape, have been identified and include:

- vegetation clearing
- topsoil stripping and storage
- overburden removal and placement
- quarry bench development
- stockpiling
- processing plant and ancillary facilities
- haul roads
- water storages and control structures
- bund walls
- landscaping

3.8.3 Performance Targets

Quarry management will ensure that part of the annual budget allocates funds for Landscape Master Planning Activities, including rehabilitation, vegetation enhancement and land management of the site.

The principal parameters for land management of the site relate to the establishment of a stable, self sustaining post extraction environment. Particular performance targets are:

- Rehabilitation/vegetation works will commence within six (6) months of final limits of extraction being attained (given that favourable weather conditions prevail);
- Ground covers, shrub layer and canopy plant species will be planted to a density which is self sustaining, and similar to existing rural environments in the locality; (For terminal benches and batters, a range of species including ground covers, mid story, and canopy species would be established. The planting density would be varied so that dense planting (or wood lots) will be created as well as corridors with open grassed areas with occasional 'specimen' or grouping of trees. The floor of the workings will become an internally draining lake, while plant and stockpile pads will be returned to open pasture;
- Declared plants, environmental weeds and animal pests are to be controlled in accordance with best practice land management for the district;
- At the end of the quarry life and as part of site rehabilitation, all class 1, class 2 and class 3 declared weed species will be part of an eradication program, to remove them from the site.

3.8.4 Site Preparation Procedures and Practice

Landscape Planning and Planting

The planting of the landscape buffer vegetation on the western boundary (quarry entrance side) will be undertaken progressively, with the upper planting and vegetation buffer to follow drainage lines and occupy a broader rehabilitation area rather than in a straight line.

Landscape planning is designed to enhance the natural landscape character of the site. It achieves this by retaining existing native vegetation where possible, and enhancing the site with additional landscaping and plantings of vegetation in keeping with the surroundings.

The following measures will be employed to ensure the landscape of the operating quarry is enhanced:

- Vegetation buffers of at least 20m will be maintained along boundaries adjoining Murray's Road and Simpson's Road as shown in FIGURE 9 LANDSCAPING, VEGETATION AND FENCING PLAN. These buffers will be progressively established and maintained so they provide wherever practical, an effective visual screening of future quarrying activities.
- Some existing vegetation will be maintained undisturbed as shown in FIGURE 9. Where there is potential for disturbance to this vegetation, appropriate signage and / or fencing will be erected.
- Landscaping and planting will be used to enhance the site entrance, and provide screening to the site, as shown in FIGURE 9.
- Topsoil used for landscaping will be sourced from site, or if imported, comply with AS4410 – Soil for Landscaping and Gardens.
- Plants to be utilised should be drawn from Table 2 – Planting Guide for Kin Kin Quarry.
- Planting will not be undertaken in extreme hot, cold or atmospheric disturbances.
- Each seedling plant will be placed in a separate hole, 100mm wider and deeper than the container.
- Appropriate plant fertiliser for native species will be incorporated at the time of backfilling.
- Each plant should be tapped down to create a shallow water holding depression.
- Each plant will be watered immediately on planting.
- Mulching should be undertaken concurrently with planting, with a "Bush Mulch" or similar material.
- Mulch should be to a minimum 100mm depth and be kept 50mm from stems of plants to avoid collar rot.
- Ground covers are included in the species palette to provide living mulch once established.
- An appropriate watering system may be installed to assist the early development of the plantings.
- Fertilising with suitable native plant fertilise (i.e. low nutrient) should be undertaken on an as needed basis.
- Regular maintenance of the landscaped areas should be undertaken to monitor and control factors such as weed infestation and mulch thickness.
- Perimeter Fencing will be designed to be in keeping with the rural nature of the site, whilst preserving public safety. The location of perimeter fencing is shown in FIGURE 9.
- Vegetation clearing in advance of development is to be undertaken in a staged manner, to allow fauna to leave the site and seek refuge in neighbouring undisturbed areas.

Rehabilitation Planning

Rehabilitation planning should consider the site conditions, extraction program, progressive rehabilitation and post extraction land use. Although extraction changes the soil conditions, microclimate and landform, studies of the surrounding conditions provides a sound basis for planning and design of rehabilitation works.

Data collected for planning rehabilitation could include:

- soil types and characteristics
- water quality
- climate
- vegetation communities
- fire pattern
- previous and proposed land uses
- topography
- pest and weed infestation
- cost/benefit analysis

Topsoil/Growth Media Management

Successful rehabilitation and land management is primarily determined by the availability of good quality plant rooting media.

The following measures will be employed to ensure the availability of good quality plant rooting media for use in rehabilitation:

- planning which areas are to be stripped of topsoil;
- estimating the quantity of topsoil to be salvaged;
- estimating the quantity of topsoil to be used directly in the works and the quantity to be stored or otherwise disposed of;
- allocating areas for topsoil storage;
- providing erosion controls to control runoff;
- stripping topsoil following vegetation clearing to a maximum depth of 200 millimetres with a bulldozer or similar equipment;
- stockpiling topsoil in areas adjacent to the workings or, whenever possible, spreading it directly onto areas available for rehabilitation works;
- constructing temporary (not programmed for rehabilitation works within 3 months) topsoil stockpiles around the periphery of disturbed areas to a maximum height of 3.0 metres, stabilising, revegetating, and generally treating so that the topsoil remains in a productive condition for subsequent rehabilitation use;
- constructing temporary topsoil stockpile batters no steeper than 1 on 2;
- planting, seeding and fertilising temporary topsoil stockpiles to promote the growth of a grass cover and to maintain the biological activity (rhizobium, Frankia sp, and mycorrhiza) of the soil;
- stripping topsoil when it is moist (viz. neither wet/saturated or dry) to avoid compaction and loss of soil structure; and
- using topsoil for amenity bund construction, road batter revegetation and amenity plantings.

Weed Management Removal and Control

Weed management will be completed on site to ensure that:

- A list of declared weed species is provided (Class 1, 2 and 3) and their location on the subject land is recorded;

- Identity areas in which weed control should be a priority in light of the proposed expansion of the existing extraction operation;
- Provide guidelines for on going weed management that will ensure the maintenance of ecological processes on the subject land; and
- Recommend monitoring procedures to identity subsequent re-infestation by declared species.

It is a legal requirement of the landholder that all Class 1 and 2 weeds listed under the provisions of the Land Protection (Pest and Stock Route Management) Act (2002) be eradicated. As a consequence, this Management Plan primarily focuses on the eradication of these species from the subject site. However, in addition to this it is recommended that Class 3 and Environmental weeds are controlled to enhance the ecological function of and native flora recruitment on the subject site.

Irrigating and Watering Procedures

- After planting the area will if required be thoroughly watered with a minimum of five litres per plant to remove air, and to settle soil around.
- Watering is recommended to be carried out on a daily basis for three days after planting followed by twice weekly for two weeks and then as required according to rainfall, weather conditions and nature of the soil.

Perimeter Fencing Design and Location

Perimeter fences exist on site which are designed to as multi strand 1.2 metre high barbwire fences which are in keeping with the rural setting of the site. When required higher security fences will be installed on the southern and eastern flank of the site when development and risk assessment dictates that they be installed as protective measures for the public. Signs denoting the quarry operations have been installed at regular intervals on the southern and eastern fence areas.

Enhancement of Environmental Linkages and Corridors

Around the eastern and southern perimeter of the quarry i.e. along Murrays Road and Simpsons road a environmental biodiversity corridor will be kept and managed for enhancement over time. This enhancement will include ongoing weed management activities, ecological restoration and rehabilitation activities and other activates as required to ensure that over time this area is enhanced for conservation purposes.

Water Management

The Water Management Plan as described in the Environmental Management Plan will be implemented to control water runoff and impacted water quality.

Landform Management

The practicalities and economics of extraction will determine the final landform. No major reshaping or filling of the workings for accommodating a particular sequential land use is proposed. The resulting landform will in the main be determined by the need to extract the maximum quantity of material within the nominated environmental performance targets.

The final landform will be created by slightly modifying the landform resulting from drill and blast extraction methods. A post extraction land use concept has been prepared and is shown as FIGURE 10 LONG TERM REHABILITATION CONCEPT.

Rehabilitation will be undertaken in a staged manner, as terminal batters and benches are reached. Rehabilitation works will commence within 6 months of terminal batters and benches being reached.

The following measures will ensure that the landform created by quarry activities is stable and is married into the surrounding landscape.

- Flattening the gradients of batters, to a stable angle of repose, on reaching the terminal limits of extraction. Batter treatment for the terminal batters for rock faces and earthen slopes are shown on FIGURE 11 BATTER TREATMENTS;
- Using earthmoving equipment to progressively shape and trim the workings to the design profiles;
- Sloping batters of permanent roads to gradients suitable for maintaining a permanent vegetation cover;
- Rounding or marrying the batters into the natural ground surface;
- Providing access to the terminal workings to allow maintenance of rehabilitation works; and
- Designing landform and drainage to control erosion for the particular hydrological regime.

Vegetation Establishment

A proposed species palette, schedule and planting layout is shown in FIGURE 12 PLANTING LAYOUT , which is intended to provide a guideline for actual tree/shrub planting, under the supervision of a competent person (eg horticulturist, person experienced with landcare etc). Variations to the planting schedule in FIGURE 12 may occur upon the recommendation of the competent person/horticulturalist – any such changes will be discussed with the Council environmental officer.

The following measures will be undertaken to enhance vegetation establishment.

Terminal Batters/Benches

- placing or preparing rooting medium of varying depths from 300mm to 1.0 metres, capped with topsoil to a minimum depth of 60 millimetres;
- deep-ripping tracks, roadways and hardstands not required at the cessation of extraction and planting with trees, shrub and ground covers or pasture grasses;
- maintaining quarry drainage, erosion and sediment controls during topsoil spreading and vegetation establishment; and
- shattering terminal benches with a rock breaker or subgrade drilling prior to topsoil spreading activities.

Materials for Rehabilitation

- using topsoil and overburden won, in the progressive development of the quarry, for rehabilitation works. Green mulch and hay may be imported and mixed with soils or used to cover soils;
- using indigenous trees and shrubs wherever appropriate;
- undertaking direct seeding trials;
- encouraging natural revegetation;
- sourcing water from the settling ponds/water storage on the site to irrigate planted seedlings only if necessary to ensure the survival of seedlings;
- watering planted seedlings with water which meets the following parameters:
    - pH between 5.0 and 8.0.
    - total soluble salts concentration less than 1000 mg/l (electrical conductivity of 1500 μS/cm).
    - no chemicals or compounds toxic to plant growth.
- using plants true to scheduled nomenclature. Plants to be healthy, well formed, not root bound, sun hardened, and pest and disease free nursery stock.

TABLE 2
PLANTING GUIDE FOR KIN KIN QUARRY

Scientific Name	Common Name	Form
Acacis sp	Wattle	Tree, Medium shrub
Alphitona excelsa	Red Ash	Tree
Angophora leiocarpa	Smooth barked Apple	Tree
Banksia robur	Swamp Banksia	Medium Shrub
Corymbia citriodora	Spotted Gum	Tree
Corymbia intermedia	Pink Bloodwood	Tree
Cymbopogon refractus	Barbed Wire Grass	Grass
Eriostemonn sp	Qld Wax Flower	Small Shrub
Eucalyptus crebra	Narrow leaf ironbark	Tree
Eucalyptus microcorys	Tallowwood	Tree
Eucalyptus siderophloia	Northern Grey Ironbark	Tree
Eucalyptus propinqua	Grey Gum	Tree
Eucalyptus terreticornis	Forest Red Gum	Tree
Lomandra confertifolia	Mat-rush	Grass
Lophostemon confertus	Brush Box	Tree
Microlaena stipoides	Weeping Grass	Grass
Poa labillardierii	Tussock Grass	Grass

It is noted that the above list is far from exhaustive and in addition to this nominated list, species from PSP03 may be used if available to add greater diversity to the planting regime.

Maintenance Program

A maintenance program will be implemented to ensure that landscaping and revegetation is successful. Elements of the program are detailed below.

- engage external competent person/horticulturist to oversee planting, and maintenance of revegetated including inspection, rectification of problems and infill planting if a higher planting density is required;
- assessing planted trees, shrubs and grasses showing nutrient deficiencies and fertilising with an appropriate fertiliser;
- inspecting and controlling noxious or declared weeds (classes 1, 2 and 3); and
- maintaining nominated fire controls.

3.8.5 Monitoring and Reporting

- Monthly inspection of planted/rehabilitated areas will be undertaken by the Quarry Manager to determine the need for maintenance works (fertilising, weed control, erosion repair or control works, thinning of plants, pruning) and replacement of failed plantings.
- Landcare advisor/horticulturist to be engaged to supervise planting of western landscape buffer and its maintenance.
- Quarry Manager to arrange for remedial works, if required, following the annual inspection.
- Formal monitoring of rehabilitated areas will be undertaken every three (3) years to determine the density of seedling establishment and the success of establishment methods employed.

3.8.6 Responsibility

- The Quarry Manager will ensure that the measures to progressively rehabilitate disturbed areas are implemented at the quarry.
- The Quarry Manager will ensure that land disturbed is that absolutely essential for extraction.
- The Quarry Manager will ensure that any Noxious and declared weeds/pests identified and the date and method of control will be recorded in the operator's daily diary.
- All employees will ensure there is no intrusion into buffer land and rehabilitated areas.
- The Quarry Manager will ensure all new employees are inducted and trained on the requirements of the Rehabilitation (Landscape and Ecological) Management Plan.

3.8.7 Corrective Actions

- Quarry management to establish work procedures and training of employees to ensure buffer land and rehabilitated areas of the site are not unnecessarily disturbed.
- Noxious weeds identified on the site will be controlled before they flower and produce seed.
- Terminal workings which have not been rehabilitated within 6 months of being attained (given that favourable weather conditions prevail), will be rehabilitated.

3.8.8 Auditing and Review

Quarry Manager (or consultant) will keep a record (including a photographic record) of work undertaken in the preceding 12 months, compare the monitoring results against relevant legislative requirements, licence conditions and nominated performance targets, and review changes to the extraction or processing activities employed at the site and any complaints received and actions taken.

3.9 Traffic Management Plan

This Traffic Management Plan (TMP) primarily deals with vehicles engaged in product haulage from Kin Kin Quarry however, other heavy vehicles that service the company's quarries are included.

3.9.1 Rationale

Due to the nature of a Quarry Operation, there will be additional traffic from haulage vehicles transporting the quarry product to customers in the surrounding region. There will be minor additional traffic from site employees.

The principal objectives of the Traffic Management Plan are to manage the impact of haulage vehicles on the local roads and community.

3.9.2 Issues/Aspects/Impacts

The principal issues involved in the haulage of product from the quarry site are:

- Safety
- Noise and Vibration
- Dust
- Product spillage
- Increased road maintenance requirements

Haulage from Kin Kin Quarry is anticipated to be by a range of truck configurations. Product haulage will be along the existing quarry access road to Shepperson's Lane thence to the Kin Kin – Pomona Road. From Pomona, the major road network or the Bruce Highway will be utilised, depending on the final destination of the product.

Apart from Sheppersons Lane, all roads are sealed State Controlled Roads.

Previous works on Sheppersons Lane (as required by current town planning consent from Noosa Council (TPC 1899 – 21/7 1987) and subsequently modified by Court Order dated 13/5/1988) have been carried out by the previous lessee of the quarry site. These upgrade works included:

- Upgrading the intersection of Sheppersons Lane and Kin Kin road to the requirements of the Main Roads Department.
- Widening and upgrading Sheppersons Lane from the intersection with Kin Kin road, to the Quarry access point using appropriate gravel fill or material approved by the Shire Engineer for the quarry site.
- Upgrading the existing timber bridge on Sheppersons Lane to a suitable standard for quarry-generated traffic (following receipt of Engineers investigation into the existing bridge).

Roadworks to widen and seal Shepperson's Lane past any neighbouring residences are proposed for the first half of 2012 (following Council approval). Approximately 950m or two thirds of the length of Sheppersons Lane from the Pomoma-Kin Kin Road will be widened and sealed.

The quarry product haulage route along the Pomona-Kin Kin Road is narrow, winding and contains numerous hills, 3 single lane bridges and other testing driving conditions – in particular there is the operation of the local School Bus. Traffic safety along this route will be an ongoing priority for the company and the community.

3.9.3 Performance Targets

The target for the Kin Kin Quarry is to minimise traffic-related community complaints and have no incidents or accidents involving haulage vehicles associated with the quarry. Additionally it is noted that the site is in a rural environment and that trucks must not arrive at the quarry site prior to the approved operating hours and must not leave the site with a full load after the approved operating hours.

3.9.4 Management Procedures and Practice

Neilsens has adopted a Road Transport Protocol across its quarrying, concrete and distribution operations addressing traffic management issues, driver code of conduct, driver training and authorisation for company drivers, and special conditions for the Kin Kin Quarry. This is attached as APPENDIX 4: NEILSEN'S ROAD TRANSPORT PROTOCOL.

Specific control measures to be adopted at Kin Kin Quarry include:

- Installation of approved signage on both approaches to the Shepperson Lane on the Kin Kin Pomona road, warning of heavy vehicle traffic movements.
- Implementation of the road transport protocol and a "Drivers Code" which includes avoiding cartage during times when the school bus is using the local road system.
- Restricting speed of heavy vehicles along Sheppersons Lane.
- Sealing of Shepperson's Lane according to agreement with Council and maintenance to an appropriate standard to minimise noise, dust, tracking of fine materials onto sealed road surfaces.
- All loads except large rock boulders, will be covered. The quarry will adopt a 'no tarp' 'no load' policy.
- Vehicles will be fitted with well maintained engine mufflers.
- Reduced speed and increased care to be taken by drivers approximately 2.5 km south of Kin Kin (as per the Road Transport Protocol in APPENDIX 4, where the Pomona-Kin Kin road becomes steep and winding.
- Ongoing liaison with drivers, Council and community to identify priorities for continual improvements in road traffic safety for the Pomona-Kin Kin road.
- Discourage practices such as truck early arrivals or convoying which can impact on residents and other road users.
- Unless in the case of emergency or as otherwise agreed with Council heavy equipment/machinery such as drilling rigs and earth moving machinery will not use the Noosa Trail from the exit point off Sheppersons Lane including Simpsons Road.

3.9.5 Monitoring and Reporting

Any complaints received at the quarry will be recorded in the complaints register. The Quarry Manager will investigate complaints and take actions in accordance with the complaints handling protocol (refer Section 3.12).

Noise or dust monitoring will be undertaken to investigate a noise or dust complaint from road haulage, providing this complaint is reasonable and not frivolous or vexatious.

There will be a weekly inspection of road approaches to the quarry for build up of product spillage and actions taken to remove any unacceptable build-up of gravel or clay.

There will be regular inspection of road surfaces, lines of sight and inspection of safety signs for damage, general condition or obscurement by vegetation.

3.9.6 Responsibility

The Quarry Manager will be responsible for educating all transport operators of the requirements of the Drivers Code. The Quarry Manager will also be responsible for enforcing the requirements of the Drivers Code.

The Transport Operators are responsible for understanding and following the Drivers Code. The Transport Operators are also responsible for reporting any accidents, incidents or near misses to the Quarry Manager.

The Quarry Manager shall investigate any community complaints, in accordance with the Community Relations Management Plan.

The Quarry Manager is responsible for recording and investigating any transport related accidents, incidents or near misses.

3.9.7 Corrective Actions

The Quarry Manager will, following appropriate investigation, inform transport operators of legitimate community complaints, and modified procedures to be followed to prevent repeat complaints.

Where inspection or reporting indicates product spillage or build-up, clean up the product spillage or build-up of gravel/clay material, as soon as reasonably practical.

Make changes to procedures/drivers code/signage as necessary to prevent repeat transport related accidents, incidents or near misses.

Following inspection of road and safety signage, undertake maintenance as necessary.

3.9.8 Auditing and Review

The Quarry Manager will review the Drivers Code every 2 years to make sure it remains relevant to the site and local situation.

Quarry Manager (or consultant) will keep details of any complaints received, actions taken and details of any transport related accidents, incidents or near misses. These will be communicated with the relevant transport authorities.

3.9.9 Special Conditions

The main haulage route for trucks using the Kin Kin Quarry is the Pomona-Kin Kin Road. This road is narrow, winding and contains numerous hills, 3 single lane bridges and other testing driving conditions, particularly operation of the local School Bus, which need special attention. Accordingly, drivers of haulage vehicles using the Kin Kin Quarry are required to adhere to the following:
Truck Drivers are to be especially wary of oncoming vehicles and ensure that they stick to the LHS of the road at all times.

- A recommended maximum speed to be used on Sheppersons Lane and the winding 3 km section of the Pomona Kin Kin Road is 40 kmph.
- Truck Drivers are not to overtake other vehicles.
- Single Lane Give Way signs are to be strictly adhered to.
- The School Bus generally operates in school terms between the weekday hours of: 6:30 to 8:00am and 3:00 to 4:30pm. During these times, the quarry will seek to minimize truck movements by re-scheduling product deliveries from the site and discouraging unnecessary truck movements on the Kin Kin Pomona Road, during these hours.
- If the School Bus is encountered along the Kin Kin Pomona Road then it is a requirement that the School Bus must not be overtaken, unless indicated to do so by the Bus Driver, and it is safe to do so.

- Trucks must not arrive at the quarry site prior to the approved operating hours and must not leave the site with a full load after the approved operating hours.

3.10 Blasting Management Plan

3.10.1 Rationale

Blasting can result in ground vibration and air blast overpressure that may cause annoyance, discomfort and alarm to blast site neighbours or, in extreme circumstances, cause damage to buildings, structures and services.

The objective of the blast management plan is to ensure blasting activities are carried out in accordance with Australian Standard AS2187-2-1993 to minimise any public concerns in relation to ground vibration and air blast overpressure.

3.10.2 Issue/Aspects/Impacts

Blasting for quarry development works can take place several times in a month, but for production blasts the quarry is expected to conduct a blast about once every month over the next few years, once commercial quarry production is established.

There are established and proven design methodologies and technologies for blasting of hard rock at the quarry site, that can ensure any impacts are managed to below acceptable emission thresholds.

Nevertheless, poor blasting practice has the potential to generate unacceptable levels of ground vibration and air blast overpressure, and at a much lower probability, flyrock, dust, and fumes.

3.10.3 Performance Targets

Performance targets for blast management and its environmental impacts are based on DERM's *Noise and Vibration From Blasting* guidance note dated 23rd March 2006. The key provisions from this guidance note are summarized below:

(a) the airblast overpressure is no more than 115dBL (Linear) peak for 9 out of any 10 consecutive blasts;

(b) the airblast overpressure must not exceed 120 dBL peak for any blast;

(c) the ground-borne vibration must not exceed a peak particle velocity of 5mm per second for 9 out of 10 consecutive blasts initiated; and

(d) the ground-borne vibration must not exceed a peak particle velocity of 10mm per second for any blast.

No flyrock greater than 50m from the blast.

3.10.4 Management Procedures and Practice

Blasting will be restricted to between the hours of 09.00am to 03.00pm weekdays (special circumstances aside). Sentries will be placed to prevent any inadvertent access to the site when blasting. Neighbours to the quarry will be advised as soon as is known (normally within 1 to 2 days) of the date and expected time for a forthcoming blast by the quarry. Signage will also be erected on the Noosa Horse Trail to advise trail users that they are approaching the vicinity of a quarry site where occasional blasting occurs (eg monthly, for a few seconds). The trail riders are not at physical risk from the blasts because of the distance from the quarry blasts, but blast noise could startle horses and risk injury to rider and horse. The signage will be prepared in consultation with the Noosa Trail people who are horse riders. Quarry management

will be responsible for ensuring that blasting is carried out to minimise the level of air blast overpressure and ground vibration generated.

Quarry management will adopt modern blasting technology (leading industry practices) and blasting risk management practices including securing of the site during the blast. Only suitably experienced and qualified blasting personnel will be employed to provide blasting services. These services may include laser surveying of quarry face profile; blast-hole design and layout; blast-hole deviation measurement; explosives loading and blast initiation planning; priming, loading, stemming and initiation of blast; ground vibration/air blast monitoring; and reporting.

Blast shot loading practices shall be documented and supervised by the Quarry Manager to ensure explosives are appropriately confined by interlocking stemming of sufficient depth and that appropriate burden distances are provided.

A blast plan shall be prepared for each blast shot and shall describe shot hole layout, initiation sequence, charging, stemming type and height, charge weight and any other design element required for good blasting practice, including management of any secondary blasting or breakage that may be required from time to time. The blast plan shall include actions to be taken if levels of induced air overpressure or ground vibration approach maximum permissible levels.

Various options are available for controlling vibration and air blast from blasting activities. Australian Standard AS2187-2-1993 outlines the principal variables that may influence the level of ground vibration and air blast overpressure resulting from blasting. These variables and their relative significance are shown in TABLE 3 - GROUND VIBRATION AND AIR BLAST CONTROLS.

TABLE 3 GROUND VIBRATION AND AIR BLAST CONTROLS

VARIABLES	GROUND VIBRATION AND AIR BLAST CONTROLS					
	INFLUENCE ON GROUND MOTION			INFLUENCE ON OVERPRESSURE		
	Significant	Moderately Significant	Insignificant	Significant	Moderately significant	Insignificant
1. Within the control of blasting operators Charge mass per delay (MIC)	X			X		
Delay interval	X			X		
Burden and spacing		X		X		
Stemming: *Amount* *Type*			X X	X X		
Charge length and diameter			X		X	
Angle of blast-hole			X			X
Direction of initiation		X		X		
Charge mass per blast			X			X
Charge depth			X	X		
Covering of detonating cord			X	X		
Charge confinement	X			X		
Blast-hole Deviation	X			X		
2. Not in control of blasting operators General surface			X		X	
Type and depth of overburden	X			X		
Wind and weather Conditions			X	X		

Source: Australian Standard AS2187.2 -1993 Appendix J.

3.10.5 Monitoring and Reporting

- Quarry Manager is to ensure blast monitoring is undertaken to confirm that air blast and ground vibration performance targets are being met. Blast monitoring will be undertaken at the nearest residence to the blast or at an adjacent location as required.
- Additional blast monitoring is to be undertaken to investigate complaint of blasting nuisance upon receipt of request from an administering authority (DERM or DEEDI).

- The Quarry Manager will keep reports and records of any monitoring of air blast and ground vibrations at affected dwellings.
- The Quarry Manager will ensure an up to date list of residents and their addresses, contact details and preferred means of contact is kept at the quarry so that they can be contacted to advise residents of blasting details.

3.10.6 Responsibility

- The Quarry Manager is to ensure that suitably experienced/qualified explosive suppliers, drillers, shot loaders and shot firers are used for drill and blast operations at the quarry, and that all matters relating to blasting are carried out in accordance with to this Management Plan.
- All complaints received at the Kin Kin Quarry are to be recorded in the public complaints register. The Quarry Manager is to investigate complaints and take necessary actions to satisfy the complainant.

3.10.7 Corrective Actions

- The Quarry Manager is to personally meet with any person making a complaint and to resolve issues raised by the complainant. The Quarry Manager may request the services of a specialist consultant to assist in blast designs to achieve optimal environmental performance.
- Specialist consultants might be required to give advice on blasting techniques or audit blasting methods if airblast overpressure and/or ground vibration is consistently greater than the nominated performance targets.

3.10.8 Auditing and Review

- The Quarry Manager and shot firer are to undertake continual auditing and review of blast performance.
- Quarry Manager (or consultant) will keep records of monitoring undertaken in the preceding 12 months, compare the monitoring results against relevant legislative requirements, approval conditions and nominated performance targets, and review changes to the extraction or processing activities employed at the site and any complaints received and actions taken.

3.11 Ecological Restoration Plan

3.11.1 Rationale

Land subject to quarrying is intensely disturbed, however the quarry can use buffer land to 'buffer' the quarrying and related activities from the surrounding environment. Buffer land can be used for a variety of purposes which primarily include ecological restoration of the site. Ecological restoration of the site includes rehabilitation and landscaping activities which are designed to:

,

- provide for the effects of noise, dust and vibration;
- provide for, in so far as is practical, ecologically undisturbed or rehabilitated areas;
- provide for wildlife corridors and habitat;

This Ecological Restoration Plan provides a focus for managing the buffer lands and integrating the various environmental management plans for the site. The Ecological Restoration Plan will be implemented by a specialist restoration ecologist. At this point in time the local land care group has been engaged to complete the works under the supervision of appropriately qualified environmental scientists.

The principal objectives of the Ecological Restoration Plan are to:

- by rehabilitation and land care management practices "restore the land" in so far as is practical to its former ecological state;
- ensure biological resources and biodiversity are managed and maintained in so far as is practical;
- maximise the area of land returned to its former ecological state;
- reduce the potential for erosion, salination and degradation;
- protect the general amenity of the area both during and subsequent to extractive operations; and
- protect and enhance biodiversity environments.

Other objectives include:

- restricting land disturbance to that which is essential for the extraction and processing of quarry materials;
- designing post extraction landforms that are stable and compatible with the site and surrounds;
- promoting the use of local native plant species for rehabilitation; and
- minimising long term site maintenance costs.

3.11.2 Issues/Aspects/Impacts

Land degradation and management is recognised as an important environmental issue. The whole of the community benefits from ecological restoration and landcare through the prevention and control of land degradation.

The term "ecological restoration" is defined as returning the land in so far as is practical to its former ecological state post development. The term "landcare" describes programs established to address land degradation. The purpose of landcare is to ensure the long term sustainability of land resources by preventing or managing land degradation.

Ecological Restoration involves the completion of specific activities, generally rehabilitation activities, which are designed to commence immediately after a stage of quarry development has been completed. The purpose of the rehabilitation is to in so far as is practical, restore the areas in which quarrying has been completed to it former ecological state.

Contrastingly landcare involves individual property owners sharing experiences and information for community wide action to protect lands including broadacre land systems and catchments.

Extractive industry operations, by their very nature, cause land disturbance and modification of the ecology of particular environment and the landscape. This ecological disturbance and modification has the potential to result in ecological and land degradation over the short term. Activities and facilities which may cause ecological and land degradation include:

- vegetation clearing
- vehicle and mobile equipment movements
- mobile and stationary equipment noise “scaring off” native animals
- indiscriminate waste disposal
- dust deposition
- water use, storage and diversion
- sedimentation
- bush fire
- introduction of weed seeds and pests
- increase in nutrient loads
- fragmentation of bushland and introduction of edge effects
- disturbance to gullies and drainage lines
- offsite truck movements
- multiple land use
- post extraction landform and land use
- chemical storage and handling
- poor rehabilitation and landscaping
- fencing and security

3.11.3 Performance Targets

The principal performance targets for ecological restoration and land care practices relate to the establishment of a stable, self sustaining environment during and subsequent to post extractive operations.

This includes the establishment of vegetation from landscaping activities according to FIGURE 9: LANDSCAPING, VEGETATION AND FENCING PLAN.

For the construction phase of the quarry, initial landscape buffers have been established along the western buffer strip near the entrance from RL 80m to RL 65m AHD. This provides shielding from the quarry entrance road to the west of the stockpile area.

Other landscaping actions and milestones planned for completion by March 2012 include:

- established vegetation on all dam and earth embankments that have been hydro-mulched and/or stabilised with geotextile, following completion of the 2011 stormwater and erosion controls works program at the quarry; and
- Extension of the western landscaped buffer strip to RL 90m and RL 105m AHD using as a guide the planting schedule in FIGURE 12 PLANTING LAYOUT.

The landscaped western buffer strip will be progressively vegetated to the top of the hill over the next 2 years.

3.11.4 Ecological Restoration and Management Practices

Topsoil/Plant Growth Media Management Successful ecological restoration consists of rehabilitation and land management techniques. The success of the restoration works is primarily determined by the availability of good quality plant rooting media and using suitable endemic species with. To achieve success during ecological restoration appropriate topsoil stripping and handling measures will be employed to ensure the availability of good quality plant rooting media for use in ecological restoration works.

Landform Management

The final landform will generally be determined by the practicalities and economics of extraction and the overarching quarry development plans. The resulting landform will be in the main determined by the need to extract the material available pursuant to the quarry development plans.

Reasonable and practicable control measures may include but are not limited to:

- delineating on the ground with durable markers the approved extent of extraction;
- flattening the terminal batters to the maximum practicable extent, particular if the final batters are to be revegetated;
- utilising overburden and like waste materials for landforming;
- progressively reshaping and trimming the terminal batters using earthmoving equipment to the rehabilitation design profiles;
- ensuing terminal batters have gradients suitable for maintaining a permanent vegetation cover, if applicable;
- rounding or marrying terminal batters into the natural ground surface to prevent toppling subsidence and slumping;
- barring down loose rock;
- providing access to the terminal batters to allow the rehabilitation activities; and
- installing permanent drainage structures to control runoff.

Vegetation Establishment and Enhancement

Management measures for vegetation establishment and enhancement are provided in the Rehabilitation Management Plan.

Erosion and Stormwater Controls

Drainage, erosion and sediment controls are presented in the Water and Erosion Management Plan.

Weed Control and Management

Weeds (and declared plants) can affect the establishment of vegetation and can significantly affect the quality of bufferland habitat. The Land Protection (Pest and Stock Route Management) Act 2002 requires that declared weeds and plants be controlled to:

- prevent the introduction and establishment of new pests in Queensland;
- prevent the spread of established pest plants into new areas; and
- reduce the extent of existing infestations where feasible.

Reasonable and practicable weed control measures may include but are not limited to:

- ensuring equipment entering a site is free of soil and vegetation, both externally (viz. tracks/tyres, underbody, engine bay, radiator, buckets, body, chassis, trays, blades) and internally (viz. cabins, tool boxes, storage compartments);
- using materials such as mulches, seeds and seedlings for rehabilitation purposes, which are certified as declared pest free;
- spraying of disturbed areas and bufferland to control weeds. Only herbicides approved by the Department of Natural Resources, Mines and Energy should be used for weed control.

Fire Control

Fire control measures are necessary for ensuring plant and equipment, stock and bufferland vegetation is protected from fire. Reasonable and practicable fire control measures may include but are not limited to:

- installing fire controls between surrounding land and the site (the location and type of firebreak needed requires careful consideration. A poor firebreak would not only offer little fire protection but may create a significant erosion problem. Generally fire controls should be located in proximity to site boundary fencing);
- maintaining fire controls in good condition; (Note topsoil must not be disturbed during the construction and maintenance of fire controls);
- carrying out fuel reduction burns within bufferland at a frequency approved by the Department of Natural Resources and Mines, Environmental Protection Agency, local fire warden and Local Authority;
- obtaining a permit and advice from the local fire warden prior to any burns;
- only carrying our burns during favourable weather conditions;
- ensuring burns can be adequately controlled by deployment of site personnel and equipment;
- deploying mobile equipment to fight bushfires if requested by the local fire warden; and
- ensuring adequate water is available onsite to fight fires.

Maintenance and rehabilitation of gully lines, waterways and water storages

Ephemeral drainage lines and gullies as well as water storages will be managed to:

- minimise water quality impacts;
- control declared weeds established in either land or water; and
- where practical, integrated into site landscaping and post extraction rehabilitation plans (eg vegetated linkages).

Permanent diversion drains established as part of the quarry works will include fauna friendly design features following advice from fauna/flora experts.

3.11.5 Monitoring and Reporting

The Quarry Manager should carry out an inspection of work areas, protected areas, rehabilitated areas and bufferland regularly to identify:

- areas where weed control and/or vegetation enhancement is required (six monthly);
- effectiveness of installed drainage, erosion and sediment controls (monthly and following major rainfall events);
- condition of topsoil stockpiles (quarterly);
- areas where landscaping and revegetation are required (quarterly).

The Quarry Manager shall record the results of inspections and prepare action plans for capital works and maintenance.

3.11.6 Responsibility

The Quarry Manager shall be responsible for overseeing the implementation of ecological restoration activities associated with good landcare practices and shall ensure that all persons undertaking work in landcare have the required competencies and are appropriately instructed and supervised.

3.11.7 Corrective Actions

Corrective actions will be taken by the Quarry Manager if inspections or reports indicate:

- weed infestation
- high fuel loads
- excessive erosion
- waterway impacted by sediment
- presence of vermin, feral animals or pests
- uncontrolled fire
- loss or damage to natural vegetation communities or landscaped or rehabilitated areas

3.11.8 Auditing and Review

Quarry Manager (or consultant) will keep a summary of the landcare management activities in the preceding 12 months, and review changes to the extraction or processing activities employed at the site.
The Quarry Manager shall review the Land Management Plan as required and at least once every three (3) years.

3.12 Community Relations Management Plan

3.12.1 Rationale

The Kin Kin quarry operation is located in a rural community. As a member of the local community, the operator has obligations to meet and discuss issues and concerns raised by surrounding land users relating to the day to day operation of the quarry.

The objective of the Community Relations Management Plan is to foster good relationships and co-operation with the local community.

3.12.2 Issues/Aspects/Impacts

The local community has an interest in ensuring that sound quarry management is carried out and that amenity and environmental values are protected.

Quarry activities that may be of interest to the local community include:

- land clearing, and topsoil and overburden stripping (biodiversity, noise, dust and water quality);
- rock drilling, blasting and quarry bench development (noise, air blast, ground vibration, dust, visual amenity and water quality);
- raw product handling and haulage (noise, dust and water quality);
- crushing and screening activities (noise, dust and water quality);
- product outloading and haulage (noise, dust and water quality);
- vehicle movements on and off the site (noise, dust, water quality and public safety);
- maintenance works (noise and water quality);
- rehabilitation and enhancement programs (noise, dust, water quality, sequential land use and visual amenity); and
- land management (fire control, pests and water quality).

3.12.3 Performance Targets

There are no specific legislative requirements for achieving good community relations.
The general target for the Kin Kin Quarry is to prevent repeated complaints.

3.12.4 Management Procedures and Practice

A protocol for settling complaints has been prepared and sets out specific procedures and timeframes for dealing with complaints. This protocol is reproduced on the next page.

The quarry shall implement an ‘open door policy’ with the local community and welcome community members to visit the quarry and observe activities on the site.

PROTOCOL FOR SETTLING COMPLAINTS

Objective

To ensure that there is response to all complaints and that reasonable complaints are investigated and appropriate action is taken.

Complaint Recording

All complaints relating to the operation of the quarry must be recorded in a log book with the following details:

(i) time, date and nature of complaint including urgency and significance.

(ii) type of communication (telephone, letter, personal etc).

(iii) name, contact address and contact telephone number of complainant (note: if the complainant does not wish to be identified then '*not identified*' is to be recorded).

(iv) response and investigation undertaken as a result of the complaint.

(v) names of persons responsible for receiving and/or investigating complaint.

(vi) action taken as a result of the complaint investigation and signature of responsible person.

Investigating Complaints

All complaints should be investigated. The investigations should include:

- determining what activities (and equipment) were being carried out or operated at the time of the complaint.
- determining whether, at the time of the complaint, normal day to day activities were conducted or whether new activities were conducted (viz. operation of new plant and/or equipment, or operation of equipment in a new location on the site).
- identifying whether equipment or activities on the extractive industry site were the source of complaint (or whether other activities in the locality were the cause of the complaint).
- determining what potential actions may be carried out to resolve complaint and/or minimise the likelihood of further complaint.

Resolving Complaints

Resolving complaints will be necessary to ensure that a good relationship with landholders in the locality is fostered.

Resolving complaints involves determining what actions are required to resolve the complaint and to reduce the likelihood of further complaints.

To ensure that a person making the complaint is satisfied with the actions taken (if actions are required) to resolve the complaint, contact should be made with the complainant following the carrying out of investigations/actions to ensure that the complaint has been satisfactorily resolved.

Complaint Log Book

A complaint log book/register will be kept at the site office.

Management Responsibility

The Quarry Manager will be responsible for ensuring all employees at the quarry site are familiar with the procedure for complaint recording.

Employee Responsibility

Employees receiving a complaint are required to record the complaint and notify the Quarry Manager that the complaint has been received.

Employees are to show respect and understanding to complainants.

PERFORMANCE TARGETS

Complaints are to be investigated within two working days of complaint being received.

Confirmation by the complainant within one month of completion of investigations of the complaint, that the issue has been satisfactorily resolved.

No repeated complaints.

3.12.5 Monitoring and Reporting

If monitoring is undertaken, the Quarry Manager, or the consultant commissioned to undertake the study/survey, will provide an objective summary of the results of the survey to the complainant. Actions resulting from commissioning of a study will also be provided to the complainant.

The Quarry Manager will at least annually update records of property owners and contact details within one (1) km of the quarry.

The Quarry Manager shall maintain a register of all environmental complaints received in accordance with the protocol for settling complaints.

Upon assessing the complaint to the best practical extent, the Quarry Manager will record the actions taken to settle the complaint in the complaints register.

3.12.6 Responsibility

The Quarry Manager upon consideration of the complaint, will if possible, personally investigate the issue raised by the Complainant. The Quarry Manager may commission an investigatory study to determine whether the complaint can be substantiated.

Employees receiving a complaint are required to record the complaint and notify the Quarry Manager that the complaint has been received.

3.12.7 Corrective Actions

The Quarry Manager will ensure that actions to reduce the likelihood of further complaints will be undertaken.

3.12.8 Auditing and Review

Quarry Manager (or consultant) will keep records summarising any complaints received in the preceding 12 months, and review changes to the extraction or processing activities employed at the site. Any actions carried out in response to a complaint will also be included in the Annual Return Report. In addition, the *Protocol for Settling Complaints* will be reviewed, and modified where necessary.

3.13 Monitoring and Auditing Management Plan

3.13.1 Rationale

Environmental monitoring can provide information to assess whether environmental performance targets and legislative requirements have been achieved. Monitoring can also be used as a management tool to assess whether additional or modification of existing environmental management measures is required to protect the amenity of surrounding land and environmental values.

The objective of the Monitoring and Auditing Management Plan is to ensure that monitoring and auditing is carried out to assess compliance with any legislative requirements / nominated performance targets and whether environmental management practices have been successful in protecting the amenity of surrounding areas.

3.13.2 Issues/Aspects/Impacts

It is inevitable that during the life of an extractive industry operation, environmental monitoring will be carried out. Environmental monitoring may be carried out:

- during a complaint investigation;
- to assess compliance with any nominated performance targets;
- to assess the effectiveness of environmental management practices employed; and
- following a request from a local authority or the Environmental Protection Agency.

Monitoring may either be qualitative (for example, visual surveillance) or quantitative (for example, measuring sound levels at a near residence).

3.13.3 Performance Targets

The performance targets for the Kin Kin Quarry, under this Management Plan shall be;

- Monitoring shall be carried out, as required by the Environmental Management Plan.
- An Annual Return Report will be prepared within one month prior to the anniversary of the issue of the environmental authority, as required by the Environmental Management Plan.

3.13.4 Management Practices

Management will adopt standard monitoring and reporting requirements to ensure the legitimacy of the results over the life of the project and to enable trends to be detected.

The following should be recorded for all monitoring undertaken:

- reason for carrying out the monitoring;
- location/s where monitoring was conducted (description and plan showing the monitoring location/s);

- the monitoring method (qualitative and/or quantitative);
- description of the monitoring location/s including observations made (qualitative measurements – for example sampling depth, visible water quality or audibility of noise);
- prevailing weather conditions;
- the name of the person carrying out the monitoring;
- method of monitoring (for example photograph, grab sample, survey, field measurements);
- the type, model, serial number and calibration of any monitoring equipment used;
- sampling/measurement date and time, including the measurement duration/period;
- parameters measured, including units of measurement;
- measurements taken or monitoring results (for example noise levels or water quality measurements); and
- any standards, guidelines or protocols in which monitoring was carried out in accordance with (for example, noise monitoring carried out in accordance with the Noise Measurement Manual).

Monitoring records and results shall be kept at the site office for a period of at least 5 years. Management shall make available monitoring results following a written request from the local authority, Environmental Protection Agency or other relevant stakeholder.

The results of monitoring during a complaint investigation should be made available to the complainant, along with any additional measures which have been undertaken to resolve the complaint.

The Monitoring Schedule is included as TABLE 4.

TABLE 4
KIN KIN QUARRY MONITORING SCHEDULE

Environmental Aspect	Monitoring Frequency
Dust Deposition	Monthly
Complaints	As Received
Noise	Following Complaint; Daily Surveillance
Visible Dust	Daily surveillance
Flyrock	Event Inspection
Blast Report	Each Blast Event
Blast Charge Weight	Each Blast Event
Ground Vibration	Each Blast Event
Blast Overpressure	Each Blast Event
Fire Controls	Bi-annual Inspection
Bushfire Fuel Load	Bi-annual Inspection
Buffer Areas	Annual Inspection
Weeds	Six monthly Inspection
Erosion	After rainfall event & at least monthly inspection
Animal Pests	Annual Inspection
Review Employee and Contractor Environmental Competencies	New employee on commencement Existing employees on an annual basis
Site Signage	Inspect Annually
Integrity of Bunds, Packaging and Liquid Storage	Quarterly
Record and Track Regulated Waste Disposal	Event
Inspect Waste Storage Facilities	Quarterly
Update Material Safety Data Sheets	Event and Annually
Inspect Oil, Grease and Fuel Stores	Monthly
Inspect Rehabilitation Works	1 Month after Planting 3 months after Planting 6 months after Planting 12 months after Planting 2 years after Planting
Stormwater Structures	Following major rainfall events
Surface Water Quality	During discharges and following major rainfall events

3.13.5 Monitoring and Reporting

The Quarry Manager shall ensure that a suitably experienced person:

- Compares the monitoring results with the legislative requirements and/or nominated performance targets; and
- Assesses/reviews additional environmental management practices which may be required to ensure legislative requirements and/or nominated performance targets are met.

The results of the above shall be recorded in a suitable form for review by quarry management.

3.13.6 Responsibility

The Quarry Manager is responsible for ensuring that all monitoring required by the Management Plans in this document are carried out in a timely manner.

The Quarry Manager is responsible for ensuring that monitoring is carried out by experienced personnel.

The Quarry Manager is responsible for ensuring that all monitoring results are recorded in a consistent fashion, and the results are stored for easy retrieval.

The Quarry Manager is responsible for ensuring that monitoring results are assessed and reported on by a suitably qualified person.

The Quarry Manager is responsible for ensuring that any additional monitoring or changes to management practices recommended from the review of monitoring records by a suitably qualified person) be implemented in a timely manner.

3.13.7 Corrective Actions

Where monitoring or reporting has not been carried out as required in these Management Plans – carry out the monitoring as soon as reasonably practical.

3.13.8 Auditing and Review

Quarry Manager (or consultant) will keep records summarising monitoring undertaken in the preceding 12 months, compare the monitoring results against relevant legislative requirements, licence conditions and nominated performance targets, and review changes to the extraction or processing activities employed at the site and any complaints received and actions taken.

3.13.9 Reporting of Results to Council

The Quarry Manager (or consultant) will provide an annual environmental compliance monitoring report and also an annual audit report to council during the life of the project. Each report will provide a written discussion of results and also recommendations and necessary actions which are required to ensure continued compliance. Each area of the EMP assessed should be audited against the approved EMP.

3.14 Waste Management Plan

3.14.1 Rationale

Un-Managed wastes can detract from the amenity of the site and the locality, contaminate land and water and constrict post extraction land uses, attract vermin and pose a fire risk.

The objective of the Waste Management Plan is to minimise wastes generated by quarry activities and to control disposal of waste.

3.14.2 Issues/Aspects/Impacts

Principal wastes at an extractive industry site may include, but not necessary limited to:

- paper and general wastes from the office, workshop and amenities;
- scrap metals from fabricating, maintenance and construction activities;
- conveyor belts, crushing cones/plates and screens from processing plants;
- overburden and stone mixed with overburden;
- crusher dust or other by products of production;
- water from truck washdown facilities, washing plants and cleanups;
- chemicals, solvents and paints;
- oils and grease from plant, equipment and vehicle servicing;
- used machinery and equipment;
- consumables such as batteries, tyres and oil filters;
- silt and fines from sediment basins;
- used containers, drums, bags and packaging;
- water from sediment basins and sewage treatment systems;
- general rubbish, litter and miscellaneous items.

The management of oils, greases, fuels and chemicals is detailed in the Oil, Greases, Fuels and Chemicals Management Plan

3.14.3 Performance Targets

The Environmental Protection (Waste Management) Policy 2000 (EPP (Waste)) came into force in July 2000 and provides a statutory basis for waste management, for protection of environmental values and provides a framework for managing environmental impacts.

The objective of the EPP (Waste) is to protect and enhance environmental values. The EPP (Waste):

"(a) identifies environmental values to be enhanced or protected; and

(b) provides a framework for the administering authority to make consistent and fair decisions that—

(i) ensure waste is managed in a way that is consistent with ecologically sustainable development; and

(ii) minimise the impact of waste on the environment including, in particular, the impact of waste so far as it directly affects human health; and

(iii) minimise the amount of waste generated from all sources; and

(iv) promote efficiency in the use of resources; and

(v) promote the maximum use of wastes as a resource; and

(vi) otherwise achieve continuous improvement in the standard of waste management activities; and

(c) provides for the preparation of waste management programs to—

(i) minimise the amount of waste generated; and

ii) promote efficiency in the use of resources; and

(d) provides for the preparation of industry waste reduction programs; and

(e) provides for government planning for waste management.

The EPP (Waste) nominates a waste management hierarchy in a preferred order of adoption. The hierarchy is as follows;

1. *waste avoidance*
2. *waste re-use*
3. *waste recycling*
4. *energy recovery from waste*
5. *waste disposal.*

The performance target for the Kin Kin Quarry will be to manage its wastes in accordance with the EPP (Waste).

3.14.4 Management Practices

Waste Avoidance

Waste avoidance relates to preventing the generation of waste or reducing the amount of waste generated. Reasonable and practicable measures for achieving waste avoidance may include, but are not necessarily limited to:

- input substitution (using recyclable materials instead of disposable materials, for example using oil delivered in recyclable steel drums instead of non-recyclable plastic containers;
- increased efficiency in the use of raw materials, energy, water or land (purchasing consumables in bulk (viz. large containers) rather than in small quantities);
- product redesign;
- improved maintenance and operation of equipment (keep equipment in good working order to reduce wear and overhaul);
- closed-loop recycling; and
- undertaking an assessment of waste minimisation opportunities from time to time.

Waste Reuse

Waste re-use refers to re-using waste, without first substantially changing it's form. Reasonable and practicable measures for reusing waste may include, but are not necessarily limited to:

- recovering and separating solvents, metals, oil, or components or contaminants and reusing separated solvents for degreasing plant and equipment;
- applying waste processing fines to land in a way that gives agricultural and ecological benefits (using silts in rehabilitation activities);

- using water collected in sediment traps for irrigation of bufferland or rehabilitated areas and dust control;
- scaling, washing, treating overburden and dirty rock to more fully utilise the extractive resource;
- using overburden for constructing bunds and landforming; and
- using silt/sediment in rehabilitation.

Waste Recycling

Waste recycling refers to treating waste that is no longer useable in it's present form and using it to produce new products. Reasonable and practicable measures for reusing waste may include, but are not necessarily limited to:

- recovering oils, greases and lubricants for collection by a licensed oil recycling contractor;
- recovering, separating and recycling packaging (including paper, cardboard, steel and recyclable plastics;
- recycling used plant and equipment to the maximum practicable extent ;
- finding alternatives to disposal of non-recyclable materials (using conveyor belts for noise attenuation, mudflaps, ute tray liners; and
- providing suitable receptacles and storage areas for collection of materials for recycling.

Energy Recovery from Waste

This refers to recovering and using energy generated from waste. Reasonable and practicable measures may include, but are not necessarily limited to:

- Separating wastes and outloading to a licensed waste disposal facility which can burn the waste to generate heat for industrial processed or electricity (such as tyres for cement manufacture or vegetation for electricity generation).

Waste Disposal

This refers to disposing of waste which cannot be otherwise reused, recycled or used for energy recovery. Reasonable and practicable measures may include, but are not necessarily limited to:

- regulated wastes must be transported and disposed of in accordance with the Environmental Protection (Waste) Policy;
- disposal to a licensed waste disposal facility (viz landfill or transfer station); and
- disposal of effluent from on site sewerage plants in accordance with AS1547 or licensed waste disposal.

3.14.5 Monitoring and Reporting

The Quarry Manager shall ensure that a system is in place to record and track waste disposal in accordance with the Environmental Protection (Interim Waste) Regulation and the Environmental Protection (Waste Management) Regulation 2000.
Regular (monthly) visual inspections of waste storage areas should be carried out to ensure that:

- containers are not overflowing, and becoming a visual blight;
- odours are not causing a nuisance to employees or neighbours;
- weeds and / or vermin are not becoming established; and
- the waste holding facilities have not become a fire risk.

3.14.6 Responsibility

The Quarry Manager shall ensure all employees and contractors are made aware of the Waste Management Plan and the objective to reduce waste.

The Quarry Manager will ensure that the waste treatment measures are implemented at the quarry.

The Quarry Manager will ensure that temporary waste storage areas are signed, waste and recycling bins are emptied when full and materials which may cause land contamination are not disposed of on the site.

The Quarry Manager shall ensure that regular (monthly) inspections of waste storage areas are undertaken.

All Quarry Employees will be responsible for ensuring wastes are temporarily stored in the designated areas and that recycling is undertaken to the maximum practical extent.

The Quarry Manager shall ensure that a system is in place to record and track waste disposal in accordance with the Environmental Protection (Interim Waste) Regulation and the Environmental Protection (Waste Management) Regulation 2000.

3.14.7 Corrective Actions

Where inspections of waste holding areas indicate problems with overflowing bins, odour, weeds, vermin or fire risk, the Quarry Manager shall arrange for remedial actions to take place as soon as reasonably practical (i.e. remove waste to licensed waste facility).

3.14.8 Auditing and Review

Quarry Manager (or consultant) will keep records summarising monitoring undertaken in the preceding 12 months, compare the monitoring results against relevant legislative requirements, licence conditions and nominated performance targets, and review changes to the extraction or processing activities employed at the site and any complaints received and actions taken.

The Quarry Manager shall review the Waste Management Plan as required and at least once every three (3) years.

3.15 Oil, Grease Fuel, and Chemical Management Plan

3.15.1 Rationale

Quarry operations have the potential to contaminate land and water in and surrounding the site by the release of oils, greases, fuels and other hazardous substances. Contamination can be prevented by the implementation of control measures.

The objective of the Oil, Grease, Fuel and Chemical Management Plan, is to prevent the contamination of land or water and to prevent land contamination.

3.15.2 Issues/Aspects/Impacts

Various chemicals are likely to be used and/or stored on the site. These chemicals could include:

- distillate (fuel for stationary and mobile engines);
- oils (lubricants and hydraulic oils for stationary and mobile equipment);
- greases (lubrication of equipment);
- solvents (degreasing and cleaning of engine parts);
- paints and paint thinners (maintenance of equipment, buildings and signs);
- explosives (chemicals used in blasting); and
- miscellaneous chemicals (weedicides, additives to products, cleaning agents etc).

3.15.3 Performance Targets

The performance targets for the Kin Kin Quarry are:

- No major spills of oils, greases, fuels or other hazardous chemicals and compliance with relevant Australian Standards.

3.15.4 Management Procedures and Practice

Management procedures for oils, greases, fuels and chemicals used at the quarry will include:

- maintaining all material/chemical safety data sheets and information relating to the storage, use and handling of chemicals at the site office, and at the location of use;
- inducting all new employees on the use and handling of chemicals;
- preparing an accidental spill containment and cleanup protocol;
- storing flammable and combustible liquids in accordance with AS19404;
- storing and handling corrosive materials in accordance with AS37805;

[4] AS1940 - 1993:
The storage and handling of flammable and combustible liquids. Australian Standards.

- disposing of unused or unwanted substances that have the potential to contaminate the site in accordance with statutory requirements;
- storing and handling laboratory chemicals in accordance with AS2243.106;
- transporting chemicals in accordance with the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code)7;
- maintaining the site in a neat and tidy condition; and
- providing and maintaining spill containment and cleanup kits at the workshop and primary crusher.

3.15.5 Monitoring and Reporting

Each month the Quarry Manager will inspect the integrity of chemical stores, oil storages and fuel stores. This will include the inspection of bunds, enclosures or collection trays.

Monitoring results and integrity tests for fuel storages will be kept at the quarry office.

The location, volumes and chemicals involved in major spills will be reported to the Environmental Protection Agency and the Noosa Shire Council. Appropriate reporting forms are included as APPENDIX 1 AND 2.

3.15.6 Responsibility

All employees will be responsible for the safe day to day handling, use and storage of chemicals.

The Quarry Manager shall be responsible for ensuring all employees and contractors are aware of the requirements of the Oil, Grease, Fuel and Chemical Management Plan.

The Quarry Manager shall be responsible for training employees in the procedures for safe use of chemicals on site, where the use of such chemicals is a day to day requirement for their job.

The Quarry Manager shall be responsible for training all employees on the procedure for containing and cleaning up of chemical, oil and fuel spills.

The Quarry Manager shall be responsible for notifying the Environmental Protection Agency and the Noosa Shire Council of the location, volumes and chemicals involved in major spills.

3.15.7 Corrective Actions

Spillage and contamination will be immediately contained and a program designed to remediate any contamination will be implemented.

Oils and grease spills will be cleaned up and materials disposed of in accordance with statutory requirements.

Repair of bunds, enclosures or collection trays will be where inspection has found them to be damaged, or otherwise not in good order.

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5 AS3780 - 1994:
The storage and handling of corrosive substances

6 AS2243.10 - 1993:
Storage of Chemicals. Australian Standards

7 Federal Office of Road Safety (1992):
The Australian Dangerous Goods Code, Sixth Edition, Australian Government Publishing Service.

3.15.8 Auditing and Review

Quarry Manager (or consultant) will keep records of monitoring undertaken in the preceding 12 months, compare the monitoring results against relevant legislative requirements, licence conditions and nominated performance targets, and review changes to the extraction or processing activities employed at the site and any complaints received and actions taken.