APPENDIX F

PRELIMINARY SITE REHABILITATION PLAN

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MARTINS CREEK QUARRY
STATION STREET
MARTINS CREEK

AUGUST 2014
REF: 4127/R

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SECTION 1

INTRODUCTION

1.1 BACKGROUND

This Preliminary Site Rehabilitation Plan (PSRP) has been prepared for the existing and future quarry areas at Martins Creek Quarry to address long term rehabilitation of quarried and disturbed areas.

This PSRP relates to the areas used for the quarry activities including the sandstone extraction pit and faces, internal roads, loading areas, stockpile areas and the noise attenuation bund. Other areas of the site required to be revegetated and managed with a natural vegetation cover are to be incorporated into a Vegetation Management Plan. These areas include the vegetation along drainage lines, landscaping areas and any areas of retained natural vegetation within the subject site.

At this stage it is expected that basalt hard/rock will continue to be extracted with the rehabilitation works to continue on an ongoing basis to complete the earthworks required for future site rehabilitation covered in this Plan.

This Preliminary Site Rehabilitation Plan has been prepared to a preliminary stage to demonstrate the application of the site rehabilitation principles for the existing and proposed quarry areas as part of the Preliminary Environmental Assessment process.

1.2 REQUIREMENTS FOR SITE REHABILITATION PLAN

Martins Creek Quarry has been in operation as a basalt and hard rock quarry. Ongoing rehabilitation and revegetation has been undertaken on an irregular basis to reduce the extent of disturbed areas and subsequent dust and sediment movement.

As there are no standard guidelines for preparing quarry rehabilitation plans the adoption of the Rehabilitation Plan Requirements from Sydney Regional Environmental Plan N^{o}. 9 (Extractive Industries) is considered an appropriate guideline for use in preparing this Preliminary Site Rehabilitation Plan for the Quarry.

These details from SREP N^{o}. 9 are provided below in italics. Specific comment in relation to each of the requirements follows.

The information to be included in a Rehabilitation Plan are:

1. ***Contain schedules detailing the proposed phases of rehabilitation of extracted areas to ensure that progressive rehabilitation is coordinated with the extractive operations.***

   Rehabilitation of the quarry extraction area will be undertaken progressively as suitable backfill material and topsoil material for revegetation becomes available. The Rehabilitation Program is detailed in to Sections 2.1, 2.2, 2.3, 2.4 and 2.5 of this PSRP.

   Rehabilitation will be undertaken as areas containing the rock resource have finished extraction and the final extraction depth of the specific area of extraction is achieved.

2. ***Identify a final land use option towards which progressive rehabilitation can proceed.***

   The final land use (at present) is expected to be agricultural activities permissible within the zoning of the land. Final land use eg. stock grazing, horticulture (eg multi-span greenhouses) or intensive agriculture (eg poultry production) of the rehabilitated quarry pit area will be dependant on the final contours of the rehabilitated pit. The final land use is to be determined in consultation with the Consent Authority and the Landowners during ongoing consultations with Council.

3. ***Ensure that after rehabilitation the site is compatible with its surroundings and does not require ongoing maintenance in addition to normal land management practices.***

   Following rehabilitation the site will comprise three different rehabilitation areas including the rehabilitated quarry pit area, pit slopes and rehabilitated infrastructure areas (roads, noise bunds, stock pile areas, loading areas etc). The rehabilitated quarry pit and pit slops areas will require specific ongoing management and maintenance to ensure that the vegetative cover is maintained. The other rehabilitated areas of the site are expected to be rehabilitated to a condition which can be managed utilizing specific agricultural or environmental land management practices.

4. ***Identify a final stable and permanent landform which is environmentally and visually acceptable.***

   At this stage the final landform for the excavated quarry pit area is likely to be a low slope area and should incorporate a depression with sloped batters (gradients to be determined) leading to a pond at the base of the rehabilitated quarry pit. Refer to Section 2 of this PSRP for details on the Rehabilitation Program.

5. ***Ensure that the rehabilitated land surface is in a stable form conducive to sustainable vegetation cover.***

   The final land surfaces will be reshaped to stable landforms and certified safe by geotechnical engineers. Revegetation will be undertaken using appropriate seed and fertilizer mixes to achieve a suitable and sustainable grass/pasture cover on the revegetated land surface following soil tests of the areas to be revegetated as detailed in Section 2 of this PSRP.

6. ***Include an erosion and sediment control plan.***

   An Erosion and Sediment Control Plan is to be provided. This plan will require amendments when the revised PSRP is to be prepared after 3 years of operation of the expanded quarry operations.

7. ***Include a water management plan.***

   A Stormwater Management Report is to be finialised for rehabilitation purposes. This plan will require amendments when the revised PSRP is to be prepared.

8. The rehabilitation plans should include information on: soil handling, vegetation handling, erosion and sediment control, excavations, rock faces, overburden dumps, tailing/reject disposal, visual amenity, removal of facilities infrastructure.

The above matters are to be addressed in detail in the Environmental Assessment Report for the project application. Specific details in relation to soil placement, management and revegetation are to be addressed in the Final Site Rehabilitation Plan.

9. Monitoring and reporting of extractive industry operations.

The details for the environmental monitoring and reporting of the quarry are provided in the Preliminary Monitoring Program detailed in Section 3.

10. Security deposit

At this stage no details are available in relation to security deposits for the proposed restoration works. This matter will be addressed following further consultation with the consent authority.

1.3 SITE REHABILITATION OBJECTIVES

This PSRP outlines the measures, procedures and timing of works which will be undertaken to rehabilitate the site. The principal objectives of site rehabilitation are to:

i) Remove fill material (soil, rock, roadbase) from around the site and use this material (or other suitable fill material) to recontour the void created by material extraction;

ii) Recontour the excavated batters within the quarry face and extraction pit to achieve regularly shaped slopes which are structurally stable;

iii) Import suitable material (eg certified VENM or ENM) if required into the site for use in erosion and sediment control measures, drainage works, subgrade backfill and topsoiling for surface revegetation;

iv) Rehabilitate the disturbed land surfaces in a manner compatible with the final determined land use.

v) Revegetate disturbed land surfaces which have been shaped and topsoiled to create a grassed, stable soil surface or other vegetation on better slopes to prevent soil erosion and to provide a long term pasture cover suitable for future agricultural land use.

1.4 STATUS OF THIS SITE REHABILITATION PLAN

This PSRP should be considered a concept plan for site rehabilitation as the rehabilitation works will be completed on an ongoing basis as suitable material becomes available and areas where quarrying has been completed becomes available for revegetation. The extent of works required for adequate site rehabilitation will be identified in the Annual Site Rehabilitation Report for the quarry. The Annual Site Rehabilitation Report will provide and ongoing revision required for this PSRP which will be based on the extent of the excavation pit and detailed volumetric analysis of the material available for reshaping the batters of the excavation pit and extracted quarry face.

SECTION 2

REHABILITATION PROGRAM

2.1 AREAS TO BE REHABILITATED

The areas to be rehabilitated include all areas disturbed for the purposes of material extraction operation and management of the quarry. These areas and works include:

- Filling and site regrading to obtain desired site levels;
- Filling the batters of the excavation pit and extraction faces;
- Removal of the temporary haul roads;
- Removal or upgrading of the culverts over drainage lines;
- Removal of storage and loading areas;
- Removal of the noise attenuation mound;
- Revegetation of all disturbed areas.

The extent of the areas to be rehabilitated (or those areas rehabilitated in the previous years) will be identified in the Annual Site Rehabilitation Report. This plan will be based on the contour plans of the excavation pit which will identify the depth, extent and batter gradients of the excavation pit.

For site management and rehabilitation purposes the site and quarry area should be separated into Precinct Areas with Precincts incorporating the existing and proposed quarry areas and other Precincts located outside of the quarry area being retained as a visual buffer to adjoining areas.

The timing of rehabilitation works will be dependent on the rate of resource extraction for each Precinct and the final levels of the base of the quarry (quarry floor). These finished floor levels will be dependent on the determination of groundwater hydrology and site water management.

2.2 RESHAPING OF EXCAVATION PIT BATTERS

The vertical batters of the excavation pit will be reshaped to batters with an appropriate gradient subject to geotechnical recommendations based on the type of material available.

The material for batter reshaping will be obtained from the material obtained from removal of the haul road, loading area, any stockpiles available, any residual overburden and any other material imported to the site to meet the rehabilitation requirements. The final surface of the reshaped batters will be shaped with the subsoil and topsoil material contained within the stockpiles supplemented with suitable imported material. This will ensure that the suitable draining gravel material from onsite or from suitable material imported into the site is placed at the base of the reshaped batters.

2.3 TOPSOIL TREATMENT

Topsoil material for revegetation is to be sourced from soil stored on site or from suitable material imported (Certified VENM or ENM) into the site for restoration and revegetation purposes. Prior to reuse samples of topsoil material are to be analysed at a NATA registered laboratory to determine the requirements for any soil amelioration such as lime, dolermite, fertilizer, trace elements etc which will assist with providing a suitable medium for revegetation purposes. Soil tests are also to be taken from areas disturbed for roads, bunds and stockpiles to determine any soil constraints and soil amelioration requirements.

2.4 REVEGETATION

All disturbed quarried areas will be revegetated to achieve a grass or shrub/tree cover to provide a stable soil surface and to prevent soil erosion.

At this stage revegetation using native tree, shrub or groundcover species is not proposed for the quarry floor areas. These species are more suited to the batter slopes or riparian zones identified for revegetation in the Vegetation Management Plan to be prepared for the non-quarried areas.

The mix for the revegetation process will include permanent pasture species (Kikuyu, Rye Grass, Clover) with a temporary cover crop (Oats, Japanese Millet) and a surface mulch.

The steeper slopes within the reshaped quarry areas which may require a grass cover require seeding by the hydro seeding technique where the revegetation mix is sprayed onto the soil surface by a hydroseeder and covering with a protective surface mulch.

2.5 SURFACE MULCHING

All areas of revegetation on slopes will be covered by a protective surface mulch of straw, composted green waste or eucalypt mulch. This will provide surface protection against rainfall impact and protection for germinating seeds. The organic matter from the breakdown of the mulch material will also benefit the soil structure for revegetation.

SECTION 3

ONGOING MANAGEMENT OF REHABILITATION AREAS

3.1 REGULAR INSPECTIONS AND MAINTENANCE

Regular quarterly inspections (for a 5 year period) are to be undertaken to monitor the progression of rehabilitation works in the growth of revegetation and presence of any weeds or pests within the revegetated areas. Management works are to be undertaken on a quarterly basis to address any matters required to ensure the continued growth and vigour of the revegetated areas.

3.2 WEED MANAGEMENT

Any environmental or noxious weeds growing in the revegetated areas are to be removed during each quarterly management program.

3.3 PEST MANAGEMENT

Any pests affecting the revegetated areas are to be controlled by implementing appropriate pest control techniques applicable at the time of rehabilitation and revegetation.

3.4 VEGETATION MANAGEMENT

Regrowth vegetation within the revegetated areas may require controlled mowing/slashing to control growth and to encourage a robust vegetative cover. The mowing regime to be used will be dependent on the growth of the vegetative cover.

3.5 MAINTENANCE FERTILIZER

Application of fertilizers to promote plant growth on rehabilitated areas is to be undertaken six months after seeding. The type and application rate of the fertilizer is to be determined following the results of soil tests for the site.

3.6 MONITORING PROGRAM

Quarterly monitoring inspections are to be undertaken of rehabilitated areas with the results compiled into an annual monitoring report for the site. Aspects to be monitored and methods to be applied are to include:

- Photographs at standard monitoring locations to show growth and condition of vegetation;
- Details of weeds present and weed control actions implemented;
- Details of any maintenance works required for rehabilitated areas;
- Weather records for current or monitoring period.

The Annual Monitoring Report is to be integrated into the overall Annual Environmental Management Report for the site.

3.7 REPORTING

A report is to be prepared for each quarterly management program based on the results of the quarterly monitoring inspections. An annual report is to be prepared for the rehabilitation areas which is to be incorporated into the Annual Site Rehabilitation Report for the quarry.

APPENDIX G

PHOTOS OF SITE AND SURROUNDING AREAS

Photo 1: View over the main quarry floor in a south westerly direction

Photo 2: View over the main quarry floor in a westerly direction

Photo 3: View over the processing area

Photo 4: View over the processing area

Photo 5: Main crushing and screening plant

Photo 6: Refuelling area

Photo 7: View of the main site access from the administration building

Photo 8: Weighbridge to the south of the administration building

Photo 9: Rail siding and loading facility to the south of the processing area

Photo 10: Residential development along Station Street

Photo 11: Rail siding with Station Street to the right of the photo.

Photo 12: Intersection of Station Street and Grace Avenue/Cory Street

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Photo 15: Alternative access on Douglas Street (Viewed to the south)

Photo 16: Alternative access on Douglas Street (Viewed to the north, with processing area in the background)

Photo 17: Gostwyck Bridge on Dungog Road over the Paterson River

Photo 18: Intersection between Dungog Road and Gresford Road

Photo 19: Duke Street in Paterson

Photo 20: Level crossing on King Street in Paterson