mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: Ladysmith Crushed Stone Products cc

REFERENCE NUMBER: KZN30/5/1/3/2/1097

ENVIRONMENTAL MANAGEMENT PLAN

SUBMITTED
IN TERMS OF SECTION 39 AND OF REGULATION 52 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002, (ACT NO. 28 OF 2002) (the Act)

STANDARD DIRECTIVE

Applicants for prospecting rights or mining permits, are herewith, in terms of the provisions of Section 29 (a) and in terms of section 39 (5) of the Mineral and Petroleum Resources Development Act, directed to submit an Environmental Management Plan strictly in accordance with the subject headings herein, and to compile the content according to all the sub items to the said subject headings referred to in the guideline published on the Departments website, within 60 days of notification by the Regional Manager of the acceptance of such application. This document comprises the standard format provided by the Department in terms of Regulation 52 (2), and the standard environmental management plan which was in use prior to the year 2011, will no longer be accepted.

IDENTIFICATION OF THE APPLICATION IN RESPECT OF WHICH THE ENVIRONMENTAL MANAGEMENT PLAN IS SUBMITTED.

ITEM	**COMPANY CONTACT DETAILS**
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ITEM	**CONSULTANT CONTACT DETAILS (If applicable)**
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1 REGULATION 52 (2): Description of the environment likely to be affected by the proposed prospecting or mining operation

1.1 The environment on site relative to the environment in the surrounding area.

- *Ladysmith Crushed Stone Products has included the following information in the Basic Ecological and Biodiversity Screening Assessment, Riparian Delineation and Heritage Impact Assessment Reports that have been submitted in the Appendix section of this Mining Permit Application:*

  - *A detailed description of the environment on site relative to the environment in the surrounding area;*
  - *A detailed description the specific environmental features on the site applied for which may require protection, remediation, management or avoidance and*
  - *Various maps illustrating the spatial locality of all the environmental, cultural/heritage and current land use features*

1.2 The specific environmental features on the site applied for which may require protection, remediation, management or avoidance.

- *Please see above.*

1.3 Map showing the spatial locality of all environmental, cultural/heritage and current land use features identified on site.

- *Please see above. Additional maps have been submitted in the Appendix section of this Mining Permit Application.*

1.4 Confirmation that the description of the environment has been compiled with the participation of the community, the landowner and interested and affected parties,

- *In response to the Departments requests for information pertaining to the involvement of the local community, interested and affected parties and the landowner, the consultant replies as follows:*

  The description of the environment on the property and in the surrounding area was not complied with the assistance of the local community. Instead it was formulated by means of a thorough desktop biodiversity assessment followed by meticulous site inspections. These site inspections were organised with the assistance of the land owner.

  The appointed consultants and specialists developed an understanding of the site through the process of reviewing and analysing several conservation databases, documents and historical aerial imagery from various private and government sources. Of particular importance to the completion of the screening report was the assessment of the

Emnambithi Ladysmith Local Municipality: Strategic Environmental Planning Tool (SEPT), Ezemvelo KwaZulu-Natal Wildlife MINSET, Ezemvelo KwaZulu-Natal Wildlife Vegetation and SEA Databases. Once Afzelia Environmental Consultants and specialists felt that they had exhausted all available information at their disposal, site inspections were undertaken to visually confirm and assess the following:

- *The presence of endangered or threatened flora, bird, mammal, reptile, amphibian and invertebrate species in the vicinity of the site;*
- *The presence or absence of transformed land in the vicinity of the site;*
- *The presence or absence of sites and artefacts of heritage and cultural significance;*
- *The presence or absence of drainage lines and watercourses in the vicinity of the site;*
- *The current land use on the property and site;*
- *The topography of the site and the remainder of the property;*
- *The geology of the site and the remainder of the property.*

Siwinile Mthandi Community Trust recognised the importance of assisting the consultants and specialists in the completion of the respective components of the assessment and without fail provided access to the property to undertake site inspections.

Please refer to the Basic Ecological and Biodiversity Screening Assessment, Riparian Delineation and Heritage Impact Assessment Reports attached to this Mining Permit Application for more information in regard to the environmental, cultural/heritage and current land uses features encountered on the proposed quarry site.

2 REGULATION 52 (2) (b): Assessment of the potential impacts of the proposed prospecting or mining operation on the environment, socio-economic conditions and cultural heritage.

2.1 Description of the proposed prospecting or mining operation.

2.1.1 The main prospecting activities (e.g. access roads, topsoil storage sites and any other basic prospecting design features)

AGGREGATE QUARRY OPERATION OVERVIEW

The extraction of stone from a quarry is a multistage process by which rock is extracted from the ground and crushed to produce aggregate, which is then screened into the sizes required for immediate use, or for further processing, such as coating with bitumen to make bituminous macadam (bitmac) or asphalt. Please see the Ecological and Biodiversity Screening Assessment Report for illustrations explaining the aggregate mining process.

The process begins with a detailed three-dimensional survey of the quarry rock face. This allows the explosives engineer to design the blast and to plot where the shot holes should be drilled so that the blast can be carried out safely and efficiently. The survey will show if there are any bulges or hollows in the face. A bulge will need more explosive than normal to ensure that it is completely fragmented and not left in place in the face. Hollow areas require less explosive than normal. The placement of explosives is professionally planned to ensure that the required fragmentation of the rock is achieved with the minimum environmental impact.

After the face profiling survey, the drilling contractor, using an air operated drilling rig, drills the number of shot holes required, at the marked spots corresponding to the position of the holes on the blast design and at the angles and depths required. After the shot holes have been drilled, they are surveyed to check that all of them correspond to the blast design and the two surveys are combined to allow the blast engineer to work out how each shot hole is filled with explosives.

A detonator cord and high explosives are inserted into each hole to within a few metres of the top. The remaining depth is "stemmed" with quarry dust or fine aggregate. The site is then cleared. Sirens are sounded to make sure that everyone nearby is warned. The detonators are connected to the electric trigger wire and the circuit is checked. A final safety check is carried out and only when the final all clear is given does the shot firer set off the explosives. A single blast can fragment up to 20,000 tonnes of rock.

After the blast, the face and shotpile (sometimes called the muck-heap) are inspected to determine whether all the shot holes have fired correctly and no additional blasting is required. Excavators, bulldozers and TLBs then tidy up the shotpile and load the material onto trucks for transportation to the processing plant via the dirt access road. This acess road connects onto a gravel track that leads to the industrail area of Ezakheni. This is were the main processing plant is located.

No permanent structures will be established on the proposed quarry site or in adjacent areas. Only selected loading and transporting vehicles, portable chemical toilets, water storage tanks and appropriate waste receptacles. The site office will be a wooden Wendy house raised from the ground. The site camp will be positoned on a piece of ground previously disturbed by agricultural activities outside the designated mining area. The landowner has given the Applicant permission to establish the site camp at this locaton. The operations of the quarry site will be managed from this site camp.

Please refer to the Basic Ecological and Biodiversity Screening Assessment, Riparian Delineation and Heritage Impact Assessment Reports and additional maps submitted in the environmental component of the appendix section of this Mining Permit Application

2.1.2 Plan of the main activities with dimensions

Please refer to the Basic Ecological and Biodiversity Screening Assessment, Riparian Delineation and Heritage Impact Assessment Reports and additional maps submitted in the environmental component of the appendix section of this Mining Permit Application

2.1.3 Description of construction, operational, and decommissioning phases.

Please see Mining Phases and Potential Impacts provided in the environmental component of the appendix section of this Mining Permit Application.

2.1.4 Listed activities (in terms of the NEMA EIA regulations)

No listed activities are triggered by the aggregate mining activities based on the findings of the Ecological and Biodiversity Screening Assessment Report. Please see attached screening report provided in the environmental component of the appendix section of the Mining Permit Application.

2.2 Identification of potential impacts

(Refer to the guideline)

2.2.1 Potential impacts per activity and listed activities.

Please see Mining Phases and Potential Impacts provided in the environmental component of the appendix section of this Mining Permit Application.

2.2.2 Potential cumulative impacts.

Please see Mining Phases and Potential Impacts provided in the environmental component of the appendix section of this Mining Permit Application.

2.2.3 Potential impact on heritage resources

Mining activities have the potential to damage or destroy heritage sites and artefacts located on the site and in surrounding areas. For further information about the potential impacts stemming from mining activities on heritage resources, please see the Heritage Impact Assessment Report in the environmental component of the appendix section of this Mining Permit Application.

In summary the mining area have been divided in to 8 sections numbered HER01 to HER8 in several of these areas the HIA specialist has commented that the vegetation cover was too thick for thorough investigation and assessment. Mitigation measures that need to be taken to ensure that any archaeological items are protected and/or recovered are listed below and the required actions must be undertaken prior to <u>any</u> (this includes the movement of workers, machinery, plant, trucks or any other activity that could be related to mining) mining activities occurring.

An aerial photograph of respective areas is attached in Appendix A and this must be consulted on a regular basis as the quarrying work face moves along, and the mitigation measures as summarised below and as indicated in the HIA specialist report must be adhered to;

HER01
HER01 is located near the edge of the quarry. The site consists of a small area that has been levelled with rocks. The rocks at the base of this platform are recent and have been pushed there by recent bulldozer activity.
This platform may have been one of the Boer Commando encampments as it is located in a similar position on the war maps.
Because this "platform" has been damaged it is considered not to be significant.
Mitigation: The site must be mapped and photographed and surveyed with a metal detector. Should any artefacts be found amafa KZN must be informed immediately.
THIS MUST BE DONE BEFORE ANY MINING ACTIVITY BEGINS.

HER02
HER02 is a small rectangular stone walled kraal, that is younger than 50 years of age and is considered by the HIA specialist to be of low significance. Further investigation or mitigation is not required

HER03
HER03 is located on the northern side of the one road that runs close to the quarry site. The aerial photograph is not very clear. Although the site consist of 40+ human graves, stonewalls for cattle kraals and house foundations, it is unlikely that the current community living nearby have any attachment to these graves.
Significance: The site is of high significance due to the graves. It is a red flag.
Mitigation: The site should not be affected in any manner, and if it were a full social impact assessment would be required for the graves. If the graves are not to be affected then the area needs to be fenced off with an access gate and clearly demarcated before construction phase.

HER04
HER04 is a specific artefact on the one side of HER01, consisting of two engraved circles on a rock. These engravings are of medium significance as they probably relate to the Boer occupations.
Mitigation: The engraving must be removed and curated at an appropriate institution. AMAFA KZN MUST BE CONSULTED BEFORE ANY MINING ACTIVITY BEGINS.

HER05
HER05 is located in the approximate centre of the proposed quarry and consists of a modest stonewall circle approximately 2m in radius. It is possible that the feature was originally a kraal that was then re-used in the 2nd ABW. The feature is of low-medium significance as, there is nothing extraordinary about the walling.

Because it is partially obscured by vegetation, the ECO or vegetation specialist (if the ECO is not suitably qualified) must identify the plants etc.; where necessary these must be translocated

(the applicant is responsible for this being successfully undertaken and if the plants die they must be replaced in an 3 to 1 ratio-1out 3in). The walling must be mapped and photographed and the surrounding area must be surveyed with a metal detector. THIS MUST BE DONE BEFORE ANY MINING ACTIVITY BEGINS.

HER06

Assessment of this area is not possible due to thick vegetation cover. The ECO or vegetation specialist (if the ECO is not suitably qualified) must identify the plants etc.; where necessary these must be translocated (the applicant is responsible for this being successfully undertaken and if the plants die they must be replaced in an 3 to 1 ratio-1out 3in). THIS MUST BE DONE BEFORE ANY MINING ACTIVITY BEGINS, SO THAT THE FEATURE CAN BE REASSESSED. Once the vegetation has been cleared the area must be photographed and since it is within 100m of the edge of the quarry it should be mitigated and fenced off after the second assessment. The second assessment should map in the features and survey the surrounds with a metal detector.

HER07

As with HER06 above, assessment of this area is not possible due to thick vegetation cover. The ECO or vegetation specialist (if the ECO is not suitably qualified) must identify the plants etc.; where necessary these must be translocated (the applicant is responsible for this being successfully undertaken and if the plants die they must be replaced in a 3 to 1 ratio-1out 3in). THIS MUST BE DONE BEFORE ANY MINING ACTIVITY BEGINS, SO THAT THE FEATURE CAN BE REASSESSED. Once the vegetation has been cleared the area must be photographed and since it is within 100m of the edge of the quarry it should be mitigated and fenced off after the second assessment. The second assessment should map in the features and survey the surrounds with a metal detector.

HER08

HER08 is a unique site that extends for ~100m x 100m. The site consists of a multiple series of stone walled circles. Some of these circles have aged, or patinated, rocks, while the more recent ones have little patination. There are at least four graves associated with the various walls. It is of high significance, but as it is 130m from the edge of the proposed quarry it will not be affected by the current proposed quarry.

Mitigation: no mitigation is required at this time. However if the quarry comes within 100m of the site, then it will need to be fenced off. THE SITE CANNOT BE DESTROYED BY AN EXTENSION TO QUARRY.

2.2.4 Potential impacts on communities, individuals or competing land uses in close proximity.

(If no such impacts are identified this must be specifically stated together with a clear explanation why this is not the case.)

Please see Mining Phases and Potential Impacts provided in the environmental component of the appendix section of this Mining Permit Application.

SOCIO-ECONOMIC IMPACTS

Please see Mining Phases and Potential Impacts provided in the environmental component of the appendix section of this Mining Permit Application.

2.2.5 Confirmation that the list of potential impacts has been compiled with the participation of the landowner and interested and affected parties,

The list of potential impacts was complied with the assistance of the landowner and the local community. Consultation with the community, revealed concerns regarding environmental sensitivities i.e. the need to protect the aloe species that occur in the area as well as raising heritage matters i.e. graves that exist approximately 80 metres from the site boundaries. To address these concerns, Ladysmith Crushed Stone Product cc has indicated that all the aloe species within the mining area will be transplanted before commencement of mining to ensure that these are not destroyed. Afzelia Environmental Consultants also retained the services of a specialist archaeologist who undertook a detailed heritage study to ensure that all heritage matters are taken into account and mitigation measures put in place. Please refer to the heritage report attached hereto as 'Annexure D'

2.2.6 Confirmation of specialist report appended.

Please see the provided Ecological and Biodiversity Screening Assessment, Riparian Delineation and Heritage Impact Assessment Reports provided in the environmental component of the appendix section of this Mining Permit Application.

3 REGULATION 52 (2) (c): Summary of the assessment of the significance of the potential impacts and the proposed mitigation measures to minimise adverse impacts.

3.1 Assessment of the significance of the potential impacts

Please see Significance Rating provided in the environmental component of the appendix section of this Mining Permit Application.

3.1.1 Criteria of assigning significance to potential impacts

Please see Significance Rating provided in the environmental component of the appendix section of this Mining Permit Application.

3.1.2 Potential impact of each main activity in each phase, and corresponding significance assessment

Please see Significance Rating provided in the environmental component of the appendix section of this Mining Permit Application.

3.1.3 Assessment of potential cumulative impacts.

Please see the Ecological and Biodiversity Screening Assessment, Riparian Delineation and Heritage Impact Assessment Reports and the Significance Rating provided in the environmental component of the appendix section of this Mining Permit Application.

3.2 Proposed mitigation measures to minimise adverse impacts.

3.2.1 List of actions, activities, or processes that have sufficiently significant impacts to require mitigation.

Please see the Ecological and Biodiversity Screening Assessment, Riparian Delineation, Heritage Impact Assessment Reports and Mitigation Measures for Different Phases of Mining Operations provided in the environmental component of the appendix section of this Mining Permit Application.

3.2.2 Concomitant list of appropriate technical or management options

(Chosen to modify, remedy, control or stop any action, activity, or process which will cause significant impacts on the environment, socio-economic conditions and historical and cultural aspects as identified. Attach detail of each technical or management option as appendices)

Please see the Ecological and Biodiversity Screening Assessment, Riparian Delineation, Heritage Impact Assessment Reports and Mitigation Measures for Different Phases of Mining Operations provided in the environmental component of the appendix section of this Mining Permit Application.

3.2.3 Review the significance of the identified impacts

(After bringing the proposed mitigation measures into consideration).

Please see Significance Rating provided in the environmental component of the appendix section of this Mining Permit Application.

4 REGULATION 52 (2) (d): Financial provision. The applicant is required to-

4.1 Plans for quantum calculation purposes.

(Show the location and aerial extent of the aforesaid main mining actions, activities, or processes, for each of the construction operational and closure phases of the operation).

- *Various maps illustrating the location and aerial extent of the aforesaid main mining actions, activities, or process, for each of the construction, operational and closure phases of the mining operation have been provided in the appendix section of this application.*

4.2 Alignment of rehabilitation with the closure objectives

(Describe and ensure that the rehabilitation plan is compatible with the closure objectives determined in accordance with the baseline study as prescribed).

REHABILITATION PLAN FOR THE SITE CAMP, MINING AREAS AND REMAINDER OF THE PROPERTY:

Please see the closure objectives captured in Section 6, Regulation 52 (2) (f): Closure and Environmental Objectives below when considering the rehabilitation plan in this section.

1. TIME OF REHABILITATION

- *The timing of rehabilitation is critical, and rehabilitation of disturbed areas must be programmed to start after the cessation of mining activities on the site. The period between the cessation of mining activities and the onset of rehabilitation for the area must not exceed 1 month (28 days). The purpose of rehabilitation is to:*
    - *Reduce the visual impacts of the quarry site*
    - *Facilitate adequate conservation and utilisation of topsoil*
    - *Simplifies the management of runoff and attendant erosion*
    - *Reduces health and safety risks*
    - *Minimises the effects of operations on nearby communities and flora/fauna populations.*

2. SECURING THE PERIMETER

- *The fence must be monitored by security guards to identify any safety risk in terms of instability, steepness of slopes or poor drainage. Damage or weakness in the fence must be addressed immediately.*
- *If the existing fence is unsuitable, it must be replaced with a new one.*

- *Stock-proof fencing plus appropriate signage must be maintained in a satisfactory condition.*
- *Gates must be in place to provide permitted access to the site for the ongoing monitoring and management of the site.*
- *If new gates are required, they must be installed immediately.*
- *Care must be taken not to damage any existing gates and fences.*
- *Security guards must be stationed at the entrance and patrol the perimeter and monitor the fence line for signs of entry.*
- *The fence must be topped with razor or barbed wire.*

3. GENERAL SITE CLEANUP AND REMOVAL OF MATERIAL

- *The area that previously housed the site camp is to be checked for spills of substances such as oil, grease and fuels, etc. and these must be cleaned up.*
- *All hazardous waste material must be collected by a registered hazardous waste removal company for appropriate transportation and disposal at a hazardous landfill site. No material must be transported by the Applicant, Site Manager or employees.*
- *Soil that is contaminated with, e.g. fuel, oil, grease and other hazardous substances must be disposed of at an appropriate registered landfill site.*
- *All hardened surfaces on site must be ripped, all imported materials removed, and the area must be top-soiled and re-grassed using the guidelines set out in the vegetation rehabilitation plan prepared by an experienced botanist / horticulturist and approved by the relevant authority.*
- *All infrastructure and structures that have been erected must be demolished and the material removed.*
- *All equipment, portable toilets, water storage tanks, concrete footing and the site office must be removed unless proof can be provided that their presence is essential to rehabilitation activities.*
- *The portable toilets must be cleaned by a registered chemical waste company prior to the removal of these facilities to avoid leakages and spillages on the site.*
- *Water storage tanks and portable chemical toilets must be removed from the mining site unless the Applicant or Site Manager requires this source of water to irrigate rehabilitated areas, or the ablution facilities for employees. Water can be brought onto the site by means of water tankers if the Applicant or Site Manager would like to clear everything off the site. No water from the watercourse may be used for the purposes of irrigation, washing and drinking by employees.*
- *All foreign materials must be removed from the site. Non-hazardous waste must be deposited at the nearest landfill site.*
- *The burning or dumping of waste on the mining site is prohibited.*
- *Recycling of non-hazardous waste collected from the site camp is recommended.*
- *Left over, undamaged building material like cement, bricks and wood must be donated to the local community or reused on other sites instead of dumping it at the landfill site.*
- *The Applicant or Site Manager must arrange the cancellation of all temporary services.*

4. TRIMMING AND SHAPING

- *The quarry must be finished off in such a way that:*
    - *It blends in with the surrounding area and appears as a natural extension to the adjacent, undisturbed ground profiles;*
    - *Sharp edges and corners must be avoided;*
    - *Smooth and flowing curves are created to blend into the surround landscape;*
    - *Even contours must be created; and*
    - *No slopes steeper than 1:3 must be created.*

- *All material in and around the quarry left over from the mining operations (stockpiled material, over sized material) remaining in the quarry and material resulting from clearing operations must be used in shaping the quarry or disposed off. Material not capable of supporting vegetation must be buried in the quarry and covered with a thick layer of top soil approximately 500 mm deep.*

5. COMPACTION OF DISTURBED AREAS

- *All areas compacted as a result of mining operations especially where heavy vehicles have operated must be ripped to a depth of between 300mm and 750mm.*

6. ACCESS, HUALAGE ROADS AND PEDESTRAIN PATHWAYS

- *All roads and pathways not required by the Applicant or Site Manager must be closed off and rehabilitated once the remainder of the mining side has been successfully rehabilitated.*
- *The surface of roads and pathways must be ripped to ensure growth of vegetation.*
- *The requisite permanent drainage works and erosion protection structures must be established in areas at risk of erosion and sedimentation.*

7. TOPSOILING

- *Approximately 500 mm of topsoil must be applied to the newly shaped and scarified/ ripped portions of the quarry.*
- *Before topsoil is place on the ground, all weeds must be removed from the area and from the topsoil itself. The topsoil material must be spread evenly over the prepared surface to a depth of 150 to 300 mm on flat ground and to a minimum of 150 mm on slopes of 1:3 or steeper.*

8. STORMWATER MANAGEMENT

- *High runoff and erosion rates and a poorly developed surface cover can jeopardise the success of the rehabilitation and re-vegetation process, i.e. topsoil and seeds are washed away. Measures to prevent soil erosion must be established in all rehabilitated areas, mining areas, access roads, areas used for infrastructure and stockpiles, and any other*

areas disturbed during mining operations that have natural drainage routes running through them or which are not level. Measures included:

- *Appropriate shaping of the quarry area*
- *Ensuring slopes are no steeper than 1:3*
- *Stabilisation by vegetation*
- *Live staking*
- *Sandbags and diversion berms*
- *The application of chemical stabilisers*
- *Straw stabilisation*
- *Mulching*
- *And permanent drainage works such as bunds, swales and cut-off drains.*

- *Bunds: This consists of a ridge of compacted material intended to divert overland sheet flow to a stabilised outlet or channel. This must be made up of a earth bund of at least 0.5 m in height (top width 0.4 m and base 1.4 m) constructed upslope of the quarry site or area being rehabilitated. If the bund is retained for the lifetime of the quarry, it must be re-vegetated.*
- *Cut-off Drains: This constitutes a formal drainage structure to collect storm water flow and channel it into an appropriate discharge point. This must be constructed on the uphill side of the bund and side drains must be constructed to convey the flows to flat ground or into an appropriate watercourse.*
- *Drainage must be designed to avoid pooling of water on site.*
- *Drainage systems must be designed to minimise erosion caused by runoff and major rainfall events*

9. VISUAL SCEENING

- *The most effective means of mitigation against the visual impacts of the quarry site is via effective implementation of the rehabilitation process, and the attainment of stable slopes and acceptable re-vegetation of the area.*
- *Visual screening of the quarry site is advisable. Screening could involve the establishment of an earth bund 1 m high on the boundary/ periphery of the quarry*
- *Planting a screen of indigenous trees, shrubs and grasses/ groundcovers along the boundary/periphery of the quarry site.*

10. VEGETATION REHABILITATION PLAN

The Applicant, Site Manager or Land Owner must appoint a suitably experienced botanist / horticulturist to survey the site prior to mining and compile a vegetation rehabilitation plan that must detail plant translocation requirements, seed collection, seed mixing, seeding methods, planting and vegetation rehabilitation in all areas of the mining footprint. The Applicant, Site Manager or Land Owner and/or vegetation specialist must submit the vegetation rehabilitation plan to the relevant authority for approval.

The botanist / horticulturist must be familiar with KwaZulu-Natal Highland Thornveld and Tugela Thornveld vegetation units and the vegetation composition of these areas. The vegetation rehabilitation plan must include, but not be limited to the following:

- *Seed requirements, harvesting methods and locations, seed storage methods;*
- *Plant translocation requirements;*
- *Handling and management of plant material rescued (translocation areas, propagation, etc.);*
- *Establishment and maintenance of a project-specific nursery, if required;*
- *Topsoil, mulch, fertiliser and soil stabiliser requirements and application during rehabilitation;*
- *Landscaping and re-vegetation methods for each area, i.e. hydroseeding / hydromulching, planting, including locations and timing;*
- *Procurement requirements and a list of species of plants to be procured, if any;*
- *Vegetation establishment and maintenance requirements (irrigation, etc.) for all re-vegetated areas; and*
- *The use of any herbicides and pesticides, if required.*

11. GENERAL

- *On-going identification of protected plants and trees. Any protected plants or trees in proximity to the mining servitude that will remain, must be marked clearly and must not be disturbed, defaced, destroyed or removed, unless otherwise specified by EAP/ECO. Acquire the necessary permits under the National Forests Act (No. 84 of 1998) or permits from EKZNW under Schedule 12 of KwaZulu-Natal Nature Conservation Ordinance 15 of 1974 should there be a need to destroy/prune any indigenous tree canopy or destroy/translocate any protected plant species.*

12. PLANT TRANSLOCATION

- *Rescued plant material must either be planted nearby within suitable habitats in areas that will not be disturbed in the foreseeable future.*
- *Relocation of plants of conservation importance must be implemented by a qualified plant specialist.*

13. LANDSCAPING AND GROUND SURFACE PREPARATION

- *All slopes must be shaped and trimmed to approximate the natural condition and contours as closely as possible.*
- *All slopes must be left as rough as possible and must be shaped to contain ridge that would facilitate the accumulation of topsoil*
- *Prior to re-vegetation, the Applicant or Site Manager must ensure that the area is clear of any building materials and other foreign debris.*
- *All visible weeds must be removed from the area before replacing topsoil*

- *Compacted soil must be ripped along the contour and hand-trimmed. Topsoil must then be spread evenly over the surface.*
- *The final prepared ground surface must be furrowed to follow the natural contours of the land and not smooth.*

14. FERTILISER

- *Only fertiliser approved by the botanist/ horticulturalist and EAP must be used on the site.*
- *The use, storage and handling of fertiliser must be strictly controlled.*
- *Fertilisers must be suitably stored in sealed containers in areas approved by the EAP.*
- *Care must be taken when using fertilisers near no-go areas, watercourses and wetland areas and other sensitive natural areas.*
- *Soil must be well watered and moist before any fertiliser is applied.*

15. HYDROSEEDING / HYDROMULCHING

- *The hydroseeding contractor must be capable of pumping the specified seed mix, fertiliser, soil stabiliser, etc. at the specified rates over the areas to be seeded, according to the approved method statement.*
- *The hydroseeding contractor must have an agitation system, which must be sufficient to agitate, suspend and homogeneously mix with the specified slurry.*
- *The slurry distribution lines must be large enough to prevent stoppage. The discharge line must be equipped with hydraulic spray nozzles suitable for the even distribution of the slurry on the various slopes to be seeded.*

16. PLANTS / TREES

- *The botanist / horticulturist must count the number of indigenous tree that will be lost to mining activities. Based on these findings, the applicant must obtain the required number of indigenous trees for re-planting during the rehabilitation process. It is common that 3 trees are replanted for every 1 that is removed*
- *The handling, maintenance and planting of plants / trees must be undertaken under supervision of the appointed botanist/ horticulturist.*
- *The Applicant or Site Manager must ensure that each plant / tree is handled and packed in the approved manner for that species or variety, and that all necessary precautions are taken to ensure that the plants arrive on site in a proper condition for successful growth.*
- *Plants must be protected from wind during transportation. No plants with exposed roots must be subjected to prolonged exposure to drying winds and sun, or subjected to water logging or force-feeding at any time after purchase.*
- *The Applicant or Site Manager must ensure that the plants are in a good condition and free from plant diseases and pests. If they are uncertain of the condition of the plants, the botanist / horticulturist must be asked to assist in the assessment and removal of any plants infected with disease and/or pests from the site.*

- *All plants supplied by the Applicant or Site Manager must be healthy, well formed, and well rooted. Roots must not show any evidence of having been restricted or deformed at any time. The potting materials used must be weed free.*
- *There must be sufficient topsoil around each plant to prevent desiccation of the root system.*

17. ESTABLISHMENT OF VEGETATION

17.1 IRRIGATION

- *The Applicant or Site Manager must be responsible for maintaining the desired level of irrigation necessary to maintain vigorous and healthy growth, as advised by the appointed botanist / horticulturist.*
- *Water used for the irrigation of re-vegetated areas must be free of chlorine and other pollutants that will have a detrimental effect on the plants.*
- *Where hydroseeding was undertaken, the commencement of watering must be postponed until seeds have germinated and growth begins.*
- *Where an irrigation system is required, the Applicant or Site Manager must be responsible for its installation prior to seeding or planting. The Applicant must supply all required water as well as all equipment.*

17.2. WEED, DISEASE AND PEST CONTROL

- *The Applicant or Site Manager must be responsible for ensuring that all re-vegetated areas remain free of all alien and recognised weed species during the contract and establishment period.*
- *Weeding, removal methods and storage of this material must be undertaken in such a manner that prevents the re-infestation of the cleaned areas.*
- *All dead plant material must be removed immediately as it may become a fire hazard.*
- *The Applicant or Site Manager must ensure that all plants are disease and pest free. Any methods used to control any diseases and/or pests, including the use of herbicides and pesticides, must be approved by the EAP.*

17.3. TREE ESTABLISHMENT

- *Any trees planted as part of the re-vegetation must be watered three times weekly in summer, once weekly in winter, or otherwise as specified by the appointed botanist /horticulturist.*
- *Trees that die or become diseased so that they appear to be in a badly impaired condition must be promptly removed and replaced as soon as possible.*

19. ALIEN VEGETATION CONTROL

- *Although invasive alien plants are not very prevalent at the site, eradication and control is required to prevent proliferation and spread of these species at the site and into adjoining habitats. Alien infestations arising from neighbouring properties will need to be managed on a continual basis.*
- *Control of alien invasive species and noxious weeds in line with the requirements of the Conservation of Agricultural Resources Act must be undertaken.*
- *It is also essential that regular monitoring of the project site be undertaken to ensure that alien vegetation does not become established in disturbed areas. Initiate control measures immediately upon evidence of alien vegetation species introduction or spread.*
- *If any alien vegetation clearing is required within no-go areas on the property (watercourse, heritage sites and buffer zones), this must not take place without the written approval of the EAP/ECO. All alien vegetation removal within no-go areas must be supervised by the EAP/ECO.*
- *The Applicant, Site Manager and employees must comply with the following directives at all times –*

    - *All alien vegetation within sensitive areas must be cleared. Removal of woody vegetation will be undertaken as follows:*

        - *Foliar application of herbicides is prohibited.*
        - *All dense thickets of mature alien invasive woody vegetation within sensitive areas: 1) send slashers through the area first and remove all the small, thin plants by hand. 2) cut plants as low to ground as possible and apply herbicide to all cut surfaces and exposed roots.*
        - *All mature alien woody vegetation found singly or small patches within or near sensitive areas will be cut down and herbicide applied to the stump.*
        - *No heavy machinery (motor vehicles, trucks, bulldozers or bobcats) must be permitted to enter the sensitive areas on or near the development.*
        - *Special care must be taken at all times to protect indigenous vegetation in sensitive areas from trampling, accidental removal or damage during alien vegetation removal activities.*

- *Regular follow up checks must be put in place to ascertain whether the site is permanently clear of Alien Invasive plants, so that extensive and expensive measures can be avoided in the future. A maintenance plan must be compiled.*
- *The Applicant and Site Manager must always favour manual/mechanical removal methods over application of herbicides during the undertaking of the alien vegetation control measures. However, if application of herbicides is necessary, the following directives must be adhered to at all times:*

- *The safe and sensitive use of herbicides is encouraged. Cutting of vegetation without the application of herbicides can stimulate re-growth.*
- *If any alien vegetation clearing is required outside of sensitive areas, this must not take place without an inspection of the identified area by the ECO and written approval being submitted to the Applicant or Site Manager.*
- *All trees and saplings need to be cut down at a minimum height as recommended on the herbicide label and herbicides applied immediately after cutting.*
- *Eradication must start in the least infected areas.*
- *Mix the herbicides in a coloured dye so that you can accurately see which areas have been treated and whether areas have been missed.*
- *Ensure adequate follow-up treatment of alien vegetation treatment.*
- *Different herbicide application methods must be used instead of spraying. Herbicide spraying must be prohibited.*
- *While in the field, employees keep all dangerous chemicals on a plastic drip tray and in a safe, marked-out area, whilst application takes place – out of reach of the public and out of direct sun.*
- *Wear Personal Protective Equipment (PPE) at all times, to prevent inhalation, skin burns, eye irritation, or accidental ingestion.*
- *Do not allow children or pregnant women to be near or involved in chemical operations, and do not spray near children or pregnant women.*
- *If private contractors or other organisations are used for the alien vegetation removal, the Applicant or Site Manager and appointed EAP must ensure they are familiar with the above principles and additional ones included within this report.*
- *Unused herbicides and empty herbicide containers must not be disposed of on site. Please refer to the directives for disposal and management of hazardous materials contained within the EMPr before disposing of unused herbicides and empty containers.*

- *The safety of the operator is extremely important and all the proper precautions must be followed when using herbicides and other chemicals, including the use of correct clothing and disposal procedures. These instructions are provided on the packaging and containers of the herbicides or chemicals.*

20. DISPOSAL OF ALIEN PLANT MATERIAL

- *Plant material minus all seeds and flowers, must be used beneficially wherever possible, as opposed to disposing of it at a landfill site where it takes up valuable airspace, or let it further propagate on unchecked vacant land.*
- *Woody and dry material, provided no seeds are present, can be chipped and used as mulch or made available to the local community for firewood.*

- *Wet material and aquatic weeds must be combined with other organic matter and composed. Alternatively, it may be possible to use it for basket making, animal feed or other uses.*
- *Burning of alien vegetation waste material is prohibited.*
- *Burying of alien vegetation waste material in or near sensitive areas is prohibited.*
- *Any vegetation which is not viable for use must be disposed of at a registered disposal unit.*

21. MONITORING OF ALIEN VEGETATION ONSITE

- *Inspections of the site must be carried out every two months. Follow-up operations must be carried out if inspections establish that initial removal efforts have failed or if new growth / seedlings are found.*

22. GENERAL INFORMATION

- *Negotiate right of access with landowners where private land must be crossed for maintenance purposes.*
- *Accurate records of maintenance actions and associated costs must be compiled to assist with the future plans for the site.*

23. EMERGENCY PROCEDURES

- *All alien vegetation clearing teams must be aware of the correct emergency contact numbers for the areas they are working in.*
- *Draw up detailed emergency procedures for spillages of hazardous materials during alien vegetation control operations.*
- *The amount of undiluted / "neat" herbicide that goes out into the field at any given time must be restricted to 2lt containers – old cold drink bottles can be used and at no time should they be left open. For a day's work one does not need more than 1 x 2lt bottle of herbicide.*
- *No mixing of herbicides is allowed – different herbicides must be in different bottles.*

24. EMPLOYEE CONDUCT ON SITE

- *All employees involved in the rehabilitation of the mining site must adhere to the following directives already mention in the sections discussing preparation and operation:*

  - *A general regard for the social and ecological well being of the site and adjacent areas is expected of the site employees. Workers need to be made aware of the following rules:*
  - *No alcohol / drugs to be present on site; no vehicles or machinery are to be operated whilst under the influence of alcohol/drugs.*
  - *Prevent excessive noise*
  - *No firearms allowed on site or in vehicles transporting employees to / from the site (unless used by security personnel).*
  - *No unsocial behaviour.*
  - *Bringing pets onto site is forbidden.*

- ❖ *All employees are to make use of facilities provided for them, as opposed to ad-hoc alternatives (e.g. fires for cooking, the use of surrounding bush as a toilet facility is forbidden).*
- ❖ *Any construction worker found to be poaching on the property will be subjected to a disciplinary hearing and dismissed.*
- ❖ *No fires to be permitted on site. Encourage the use of gas operated cookers for preparation of food on site.*
- ❖ *Trespassing on private / commercial properties adjoining the site is forbidden.*
- ❖ *Only pre-approved security employees and workers may be permitted to live on the construction site.*
- ❖ *No worker must be forced to do work that is potentially dangerous or for what he / she is not trained to do.*

25. PROTECTION OF REHABILITATED AREAS

- ➢ *Re-vegetation must not occur in any area until operations have ceased.*
- ➢ *Once re-vegetated, areas must be protected to prevent trampling and erosion – erection of screening, demarcations and fences around such areas is advisable.*
- ➢ *No mining equipment, vehicles or employees must be allowed to gain access or move across areas that have been rehabilitated. Signage must be erected indicating these areas are out of bounds.*
- ➢ *Only equipment and employees required for the preparation of areas, application of fertiliser and spreading of topsoil and the planting of vegetation must be allowed in areas that are being rehabilitated or have been rehabilitated.*
- ➢ *Where rehabilitation sites are located within actively grazed areas, they must be fenced off and monitored closely.*
- ➢ *All fencing must be removed once a vegetation cover of 80% has been achieved.*
- ➢ *All runnels, erosion channels and wash away developing after re-vegetation must be backfilled and consolidated and areas restored to a proper stable condition. The erosion must not be allowed to develop on a large scale before effecting repairs. All erosion damage must be repaired as soon as possible*

4.3 Quantum calculations.

(Provide a calculation of the quantum of the financial provision required to manage and rehabilitate the environment, in accordance with the guideline prescribed in terms of regulation54 (1) in respect of each of the phases referred to).

- *Rate per hectare for an area with high environmental sensitivity: R80 000.00*
- *The size of the area: 3.88 ha.*
- *R310 400.00*
- *Specialist cost: R350 000.00*
- *Total rehabilitation cost: R660 400.00*

4.4 Undertaking to provide financial provision

(Indicate that the required amount will be provided should the right be granted).

5 REGULATION 52 (2) (e): Planned monitoring and performance assessment of the environmental management plan.

5.1 List of identified impacts requiring monitoring programmes.

- *The following list of identified impacts will require monitoring during the preparation, operation and decommissioning of the mining operation:*
    - *Contamination of soil, ground and surface water resources (hazardous substances and materials).*
    - *Dust & Noise Pollution*
    - *Destruction, damage or removal of heritage and cultural sites and artefacts*
    - *Drainage/ Storm water*
    - *Health and Safety*
    - *Damage to existing indigenous vegetation*

5.2 Functional requirements for monitoring programmes.

A. *Contamination of soil, ground and surface water resources due to leakages, spillages, inappropriate storage and disposal of hazardous substances and materials during preparation, operation and decommissioning of the mining operation - conduct environmental awareness training for all employees, concerning the prevention of accidental spillage of hazardous chemicals and oil, and pollution of water resources (both surface and groundwater).Implementation of six monthly water quality testing of the water course during mining operations. Routine daily inspection of work areas, site camp and access roads for signs of spillages and leakages. All vehicles and equipment must be checked for leakages and spillages of hazardous substances before they leave the processing plant on a daily basis. The appointed Occupational Health and Safety Officer will assist the Environmental Control officer with the monitoring of these issues.*

B. *Heritage and cultural sites and artefacts –The applicant with the assistance of the EAP/ECO must provide all employees with basic heritage and cultural awareness training prior to the commencement of mining operations to ensure that the discovery of new sites and artefacts are reported promptly so appropriate actions can be taken for their preservation and management, photographs are to be taken of all sites for record purposes prior to commencement of mining operations, inspections of the sites will be undertaken and the current state of the area compared against these photographs to determine whether disturbance of the areas has occurred. Monitor vehicle and employee movement to ensure they do not enter and disturb, damage or destroy heritage sites, ensure that demarcations and fences are erected and maintained around these sites, ensure that excavations do not encroach too closely on these sites. The Applicant/Site*

Manager will be instructed via fax, email, telephonic or face-to-face meeting by the Occupational Health and Safety Officer and/or Environmental Control Officer to address identified issues promptly. These findings will be recorded in reports that will be circulated for review and consideration to the Applicant and the Department of Mineral Resources

C. *Dust generated by mining activities will require monitoring during the preparation, operation and decommissioning phases – Avoid unnecessary excessive vehicle movement and limit vehicle speeds on unsurfaced roads. Water carts are to be utilised to minimise dust. Spray roads and material stockpile areas with water if dust becomes problematic.*

D. *Noise generated by mining activities will require monitoring during the preparation, operation and decommissioning phases - ensuring that the employees are issued protective clothing and ear protecting by the employer, ensuring employees wear ear protection at all times when in the vicinity of noisy mining activities e.g. drilling, blasting and crushing, identification of excessively noisily activities through discussions with the applicant, check the public complaints register at the site office for issues raised about noise stemming from mining operations affecting the local community and address these issues. Routine daily inspection of work areas, site camp and access roads will assist in the identification of noisy vehicles and machinery operating onsite that would require repairs or replacement, maintenance of equipment and vehicles would identify faults and damage that can generate excessive noise. The appointed Occupational Health and Safety Officer will assist the Environmental Control officer with the monitoring of noise levels.*

E. *Drainage/ Storm Water Management – all storm water infrastructures must be inspected weekly, as well as after rainfall events. All accumulated sediment must be removed to ensure the effective functioning of these devices. If required, the ECO or Occupational Health and Safety Officer may instruct the Applicant/Site Manager to install additional devices to control drainage and stormwater, the applicant must appoint a responsible person to undertake on-site inspections of all storm water management measures.*

F. *Health and Safety – The Occupational Health and Safety Officer and Environmental Control Officer are both responsible for monitoring health and safety issues on the site. They will monitor the stability of slopes;, whether employees wear protective clothing and ear protection; whether enough appropriate signage has been erected and maintained in the vicinity of the site; whether vehicles and equipment are maintained properly*

G. *Monitoring process for all of the above identified impacts – The Occupational Health and Safety Officer and/or Environmental Control Officer will inspect the site and identify areas of concern that would*

need prompt rectification. The Applicant/Site Manager or senior employees will be instructed via fax, email, letter, telephonic or face-to-face conversation to address identified environmental, health and safety issues on the site. The abovementioned officers will provide recommendations and guidance with respect to rectifying the identified issues and indicate time frames for completion of these tasks. If the applicant/site manager fails to rectify the identified issues within the stated timeframes, then the applicant/site manager will be deemed to be non-compliant with the approved EMPr. Non-compliance will be recorded in the monthly and annual reports submitted to the Applicant/Site Manager and the Department of Mineral Resources for review and consideration. The Department will consider the findings of the Occupational Health and Safety Officer and Environmental Control Officer and if necessary, an official from the Department will conduct a site inspection to indentify the cause of the identified issues, or issue appropriate penalties against the applicant/site manager for failing to abide by the conditions indicated in the EMP.

5.3 Roles and responsibilities for the execution of monitoring programmes.

Applicant/Site Manager

- *The Applicant/Site Manager is ultimately responsible for the implementation and operation of the project. The applicant will be directly responsible for the ongoing adherence to the EMPr during the all mining phases.*
- *The Applicant/Site Manager must ensure that all requirements of the EMPr and specialist studies and specific project details are, communicated to, understood and followed by all employees working on the mining project who have an impact on the environment.*
- *In the event of an environmental incident, the applicant / site manager must follow the following procedures:*
  - *Immediately take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons;*
  - *Notify the relevant authority and ECO in writing including the following information: the nature of the incident and initial classification; substances involved; initial measures taken to minimise impacts; causes of the incident; measures taken and proposed to avoid the reoccurrence of the incident;*
    - *Soil contamination must be reported to the Department of Agriculture and Environmental Affairs.*
    - *The contamination of any water source must be reported to the Department of Water Affairs.*
  - *Include the incident on the Environmental Incident Register;*
  - *Undertake clean-up procedures;*
  - *Remedy the effects of the incident; and*

- *Assess the immediate and long-term effects of the incident on the environment and on public health*

- *The Applicant or Site Manager must ensure that adequate environmental awareness training of senior site personnel takes place and that all employees receive an induction presentation on the importance and implications of the EMPr.*
- *Applicant/Site Manager must delegate a suitably qualified independent person(s) the responsibility of monitoring and reporting on the levels compliance to the approved EMPr.*
- *Applicant/Site Manager must ensure that the Environmental Control Officer and Occupational Health and Safety Officer must have access to the site at all times, for the purpose of inspections to ensure that the environmental conditions of the EMP are being implemented and adhered to.*

Environmental Control Officer

- *An ECO is a suitably qualified individual nominated by the Applicant to oversee and audit the ongoing implementation of the EMPr. The ECO must be independent of the Applicant/Landowner/contractor/site supervisor. The ECO will liaise with the Department of Mineral Resources, Local Municipality, Government Authorities and the public and owners or managers of properties affected by mining activities. The ECO is to have access to the site at all times and must report on the environmental aspects of the contract to the Applicant at agreed intervals. The applicant/site manager must have access to the ECO for advice on the environmental aspects of the mining project and any other associated information.*

  The ECO must:

  - *Guide, advise and consult with the Applicant and his Employees on environmental issues during mining activities.*
  - *Revise the EMPr as required and inform the relevant parties of the changes.*
  - *Secure the protection and rehabilitation of the environment.*
  - *Ensure that the EMPr has been accepted and understood as a contractually binding document on all service providers, employees and other parties that come onto the mining site.*
  - *Conduct environmental awareness training for mining employees, concerning the prevention of accidental spillage of hazardous chemicals and oil, pollution of water resources (both surface and groundwater), air pollution and litter control and identification of archaeological artefacts / historical structures.*
  - *Ensure no operator is permitted to operate critical items of mechanical equipment without having been trained by the applicant/site manager and certified competent by the Project Management.*

Occupational Health and Safety Officer

- *Advise the applicant/site manager on health and safety issues.*
- *Ensure all work injuries, work caused illnesses or dangerous events at the mine are investigated.*
- *Conducting appropriate health and safety education programme for all employees.*
- *Conduct assessments of work areas, access routes and the site camp.*

All Employees

- *All employees must be briefed regarding the requirements for dealing with potential emergencies, including fires, accidental leaks and spillage of pollutants. Education of employees must focus not only on the prevention of emergencies but also on pro-active and appropriate interventions where such emergencies occur.*
- *Identification of potential environmental, health and safety issues during all phases of the mining operation.*
- *Informing the Applicant/Site Manager or senior employees of incidents during mining operations.*

Department of Mineral Resources Official/ Regional Manager

- *Review and consideration of submitted monthly and annual reports.*
- *Based on findings of reports, conduct inspection of the site to identify reasons for incidents of non-compliance with conditions of EMPr.*
- *Issue additional directives and recommendations to resolve problems experienced on the site.*
- *Issue of penalties on the offending parties for continued non-compliance with the directives and conditions of the EMPR and other relevant legislation.*

5.4 Committed time frames for monitoring and reporting.

- *The ECO and Occupational Health and Safety Officer will submit monthly audit reports for the first six months of the mining operation to the Department of Mineral Resources, thereafter audit reports will be submitted to the Department every two months unless the Department requests some other pertinent arrangement.*
- *The ECO and Occupational Health and Safety Officer will submit annual reports to the Department. The ECO will submit a report that will cover the operational and environmental activities undertaken during mining operations over the course of that particular year.*

- *The applicant would need to submit an annual financial report or statements to the Department reflecting the balance sheets and profit and loss.*
- *An annual report detailing the Applicant/Site Manager compliance with the provisions of section 2(d) and (f) of the Mineral and Petroleum Resources Act, 2002 etc.*

6 REGULATION 52 (2) (f): Closure and environmental objectives.

6.1 Rehabilitation plan

(Show the areas and aerial extent of the main prospecting activities, including the anticipated prospected area at the time of closure).

- *Various maps illustrating the location and aerial extent of the aforesaid main mining actions, activities, or process, for each of the construction, operational and closure phases of the mining operation have been provided in the appendix section of this mining application.*

6.2 Closure objectives and their extent of alignment to the pre-mining environment.

Please consider the contents of the Ecological and Biodiversity Screening Assessment, Heritage Impact Assessment and Riparian Delineation Reports submitted in the environmental component of the appendix of this mining application, when reviewing these closure objectives discussed below.

1. Securing the Perimeter

- *The fence must be patrolled and monitored by security guards if the quarry poses a safety risk in terms of instability, steepness of slopes or poor drainage. Damage or weakness in the fence must be addressed immediately.*
- *If the existing fence is unsuitable, it must be replaced with a new one.*
- *Stock-proof fencing together with appropriate signage must be maintained in a satisfactory condition.*
- *Gates must be maintained to provide only permitted access to the site for the ongoing monitoring and management of the site.*
- *If new gates are required, they must be installed immediately.*
- *Care must be taken not to damage any existing gates and fences.*
- *Security guards must be stationed at the entrance and patrol the perimeter to deter intruders and monitor the fence line for signs of entry.*
- *The fence must be topped with razor or barbed wire.*

2. Demolition of Infrastructure and Structures

- *All infrastructure and structures that have been erected must be demolished and the material removed.*
- *Left over, undamaged building material like concrete, bricks and wood must be donated to the local community or reused on other sites instead of dumping it at the landfill site.*
- *All equipment, portable toilets, water storage tanks, concrete footing and the site office must be removed from the mining site unless otherwise*

proof can be provided that their presence on the site is essential to rehabilitation activities.

- *Please see below for appropriate process of rehabilitation of disturbed and contaminated areas of this nature*

3. Rehabilitation of Contaminated Areas

- *The area that previously housed the site camp (portable toilets, mobile site office, and the water storage tanks), access routes, work areas and surrounds must be checked for spills of substances such as oil, grease and fuels, etc. and these must be cleaned up. All areas contaminated with the abovementioned substances must be remedied.*
- *Soil that is contaminated with, e.g. fuel, oil, grease and other hazardous substances must be dug up to an appropriate depth and soil material stored in impermeable barrels or containers.*
- *Soil contamination must be reported to the Department of Environmental Affairs and the ECO.*
- *NEMWA section 36(5) provides that:*
  "an owner of land that is significantly contaminated, or a person who undertakes an activity that caused the land to be significantly contaminated, must notify the Minister and MEC of that contamination as soon as that person becomes aware, of that contamination".
- *Soil contamination must be dealt with according to the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality.*
  - *Immediate action must be taken to ensure that migration of compounds does not occur or that impacts are not aggravated as a result of remediation activities.*
  - *No on-site burying or dumping of contaminated material or soil must take place.*
  - *All contaminated soil or material handled during the remediation activities must be disposed of at an appropriate licensed waste disposal site.*
  - *Any material or soil imported to the site for remediation activities must be analysed before it can be used for on-site remediation or stabilization.*
  - *Measures must be taken to curb dust during and after remediation.*
  - *No exotic plant species must be used for rehabilitation purposes.*
  - *All contaminated soil must be kept in a manner that will reduce the possibility of the loss of soil in the event of rain.*
  - *Contaminated soil or material must not be stockpiled in areas where surface water may accumulate, in drainage channels or areas susceptible to erosion.*
  - *Under no circumstance must contaminated material supplies be placed on adjacent properties, roads or road reserves during and after the remediation activities.*
- *Any drip trays, vehicle and equipment parts, and other absorbent materials contaminated with diesel, oil and grease found in the area must be removed from the site for future use or disposed. All contaminated*

items must be placed inside impermeable containers or bags for transporting and disposal.

- *The hazardous waste removal company will collect; transport and disposal of the hazardous waste at a registered hazardous waste landfill site or another appropriate facility. No material must be transported by the Applicant, Site Manager or employees.*
- *Please see below for appropriate process of rehabilitation of disturbed areas of this nature.*

4. Rehabilitation of Disturbed Areas

- *The level of compaction of areas disturbed by mining vehicles must be addressed, prior to the spreading of topsoil, by scarifying the ground surface by hand, plough or a mechanical ripper to a depth of approximately 300 mm (and a maximum spacing of 1000 mm) to break down soil clods.*
- *Compacted soil that has become too hard to scarify, must be ripped with a mechanical ripper or other pieces of appropriate equipment to a depth of 300 mm. No section of the ground must remain undisturbed after the ripping has taken place.*
- *Before topsoil is place on the ground, all weeds must be removed from the area and from the topsoil itself. The topsoil material must generally be spread evenly over the prepared surface to a depth of 150 to 300 mm on flat ground and to a minimum of 150 mm on slopes of 1:3 or steeper.*
- *The site must be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.*
- *If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining prospecting operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.*
- *Photographs of the disturbed areas, taken before and during the mining/ prospecting operation and after rehabilitation, must be taken at specific points and kept on record for the information of the Regional Manager.*

5. Rehabilitation of Access Roads

- *Whenever a mining permit is suspended, cancelled or abandoned or if it lapses and the holder does not wish to renew the permit or right, the access road or portions thereof, constructed by the holder and which will no longer be required by the landowner/tenant, must be removed and/or rehabilitated to the satisfaction of the Regional Manager.*
- *Any gate or fence erected by the holder which is not required by the landowner/tenant, must be removed and the situation restored to the pre mining/ prospecting situation.*
- *Roads must be ripped or ploughed, and if necessary, fertilized to ensure the re-growth of vegetation.*
- *If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a seed*

mix to the Region Manager's specification.

6. Rehabilitation of the Camp Site

- *On completion of operations, all buildings, structures, objects on the camp/office site must be dealt with in accordance with Section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 002):*
- *Where office/camp sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface must be scarified or ripped.*
- *The site must be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.*
- *If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining prospecting operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.*
- *Photographs of the camp and office sites, before and during the mining/ prospecting operation and after rehabilitation, must be taken at specific points and kept on record for the information of the Regional Manager.*

7. Rehabilitation of Excavated Areas

- *All material in and around the quarry left over from the mining operations (stockpiled material, over sized material) remaining in the quarry and material resulting from clearing operations must be used in shaping the quarry or disposed of. Material not capable of support vegetation must be buried in the quarry and covered with a thick layer of top soil approximately 500 mm deep.*
- *No waste will be deposited into the excavations at anytime during the closure of the mining site.*
- *Once excavations have been refilled with overburden rock and coarse natural materials and profiled with acceptable contours and erosion control measures, topsoil must be placed to a depth of 150 to 300mm.*
- *The area must be fertilized if necessary to allow vegetation to establish rapidly. The site must be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora.*
- *If a reasonable assessment indicates that the reestablishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining/ prospecting operation be corrected and the area be seeded with a vegetation seed mix to his or her specifications.*

8. Re-vegetation

- *All areas disturbed by mining activities, including access roads, storage and stockpiling areas, etc. must be rehabilitated to the satisfaction of the EAP and landscaping contractor / horticulturist*

- *Certain areas must be identified where specific plants / trees could be planted successfully. All plants / trees used in re-vegetation must be locally indigenous species only.*
- *Re-vegetation of mining footprint must take place after completion of mining activities. The timing of re-vegetation must take cognisance of maintenance requirements and provision must be made for any irrigation requirements*
- *No mining equipment, vehicles or unauthorised personnel must be allowed onto areas that have been re-vegetated.*
- *All plant material for rehabilitation purposes must be obtained from reputable nurseries and must comprise locally occurring indigenous species only.*
- *For every aloe specimen removed from the site, two will be re-planted on the mining site and other parts of the property to appease the local community.*
- *Please see the document titled, Mitigation Measures for Different Phase of the Mining Operation located in the environmental component of the appendix of the mining application.*

9. Alien Vegetation Control

- *Although invasive alien plants are not very prevalent at the site, eradication and control is required to prevent proliferation and spread of these species at the site and into adjoining habitats. Alien infestations arising from neighbouring properties will need to be managed on a continual basis.*
- *Control of alien invasive species and noxious weeds in line with the requirements of the Conservation of Agricultural Resources Act and the Biodiversity Act must be undertaken.*
- *It is also essential that monitoring of the project site be undertaken to ensure that alien vegetation does not become established in disturbed areas, and eventually spread to surrounding areas. Initiate control measures immediately upon evidence of alien vegetation species introduction or spread.*
- *If any alien vegetation clearing is required within no-go areas on the property (watercourse, heritage sites and buffer zones), this must not take place without the written approval of the EAP/ECO. All alien vegetation removal within no-go areas must be supervised by the EAP/ECO.*
- *Spraying of herbicides must be prohibited.*
- *Avoid applying herbicides if heavy rain or windy conditions are forecasted.*
- *Application of herbicides and pesticides must be according to the manufactures instructions.*
- *To minimize the impacts on the watercourse and the buffer zone, employees tasked with removing alien vegetation must cut/slash/break individual plants and paint the herbicide on the exposed stems.*
- *Please see the alien vegetation control objectives located in the document titled, Mitigation Measures for Different Phase of the Mining Operation located in the environmental component of the appendix of the mining application.*

Final Rehabilitation

- *All infrastructure, equipment, plant, temporary housing and other items used during the mining period will be removed from the site - Section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).*
- *Waste material of any description, including receptacles, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.*
- *Final rehabilitation must be completed within a period specified by the Regional Manager.*
- *Re-vegetation must not occur in any area until operations have ceased.*
- *Once re-vegetated, areas must be protected to prevent trampling and erosion – erection of screening, demarcations or fences around such areas is advisable.*
- *No mining equipment, vehicles or employees must be allowed to gain access or move across areas that have been rehabilitated. Signage must be erected indicating these areas are out of bounds during rehabilitation operations.*
- *Only equipment and employees required for the preparation of areas, application of fertiliser and spreading of topsoil, f and the planting of required vegetation must be allowed in areas that are being rehabilitated or have been rehabilitated.*
- *Where rehabilitation sites are located within actively grazed areas, they must be fenced off and monitored closely.*
- *All fencing must be removed once a vegetation cover of 80% has been achieved.*
- *All runnels, erosion channels and wash away developing after re-vegetation must be backfilled and consolidated and areas restored to a proper stable condition. The erosion must not be allowed to develop on a large scale before affecting repairs and all erosion damage must be repaired as soon as possible.*

6.3 Confirmation of consultation

(Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties).

- *The landowner and interested and affected parties assisted in the formulation of the abovementioned closure and environmental objective mentioned above.*

7 REGULATION 52 (2) (g): Record of the public participation and the results thereof.

7.1 Identification of interested and affected parties.

(Provide the information referred to in the guideline)

- *Siwindile Mthandi Community Trust/Community*
- *Department of Land Affairs*

- *Department of Water Affairs*
- *Department of Agriculture, Environmental Affairs and Rural Development*
- *Emnambithi Ladysmith Municipality*
- *Rural Development and Land Reform*

7.2 The details of the engagement process.

- Letters requesting comment on the proposed mining operation were submitted to the *Department of Land Affairs, Department of Water Affairs, Department of Agriculture, Environmental Affairs and Rural Development, Rural Development and Land Reform and Emnambithi Ladysmith Local Municipality. Several of the abovementioned departments have responded to these letters. (11 November 2013)*
- *Several meetings and a public gathering was held with the Siwindile Mthandi Community Trust/Community to discuss the mining project.*
- *See letters and proof of public meeting provided in consultant component of the appendix section of this mining application.*

7.2.1 Description of the information provided to the community, landowners, and interested and affected parties.

The following information was presented to the local community:

- *A presentation in English and isiZulu was presented to gathered members of the local community and the tribal authority. This presentation was based on the findings of the Ecological and Biodiversity Screen Assessment and Heritage Impact Assessment Reports. (22 November 2013)*
- *The presentation consisted of the following:*
  - *Description of the mining activities that would occur on the property.*
  - *Explaining and discussing the potential impacts on the natural environment and surrounding community stemming from mining operations.*
  - *The mitigation measures that would be implemented to manage impacts.*
  - *The benefits in terms of job creation, investment in infrastructure in surrounding area*
  - *Open discussion was held to identify additional issues and concerns of local community.*

The following information was presented to Stakeholders:

- *Letters were sent by register mail to government departments and the local community. (11 November 2013)*
- *These letters explained the:*

- *Description of the mining activities that would occur on the property.*
- *Explaining and discussing the potential impacts on the natural environment and surrounding community stemming from mining operations.*
- *The mitigation measures that would be implemented to manage impacts.*
- *The benefits in terms of job creation, investment in infrastructure in surrounding area.*
- *Benefits to the municipality and province in terms of job creation etc.*
- *Copies of Ecological and Biodiversity Screen Assessment and Heritage Impact Assessment Reports were submitted with these letters for consideration.*

7.2.2 List of which parties indentified in 7.1 above that were in fact consulted, and which were not consulted.

- *All the above parties have been consulted. Please see letters and proof of public meeting provided in consultant component of the appendix section of this mining application.*

7.2.3 List of views raised by consulted parties regarding the existing cultural, socio-economic or biophysical environment.

During consultation with the community, they indicated concerns regarding environmental sensitivities i.e. the need to protect the aloe species that occur in the area as well as raising heritage matters i.e. graves that lie approximately 80 metres from the site boundaries. To address these concerns, Ladysmith Crushed Stone Product cc has indicated in the EMPr that all the aloe species within the mining area will be transplanted before commencement of mining to ensure that these are not destroyed. Afzelia Environmental Consultants also retained the services of a specialist archaeologist who undertook a detailed heritage study to ensure that all heritage matters are taken into account and mitigation measures put in place. Please refer to the heritage report attached hereto as 'Annexure D'

7.2.4 List of views raised by consulted parties on how their existing cultural, socio-economic or biophysical environment potentially will be impacted on by the proposed prospecting or mining operation.

- *The local community indicated that they were concerned about the loss of Aloe species that are found on the dolerite koppie that the Applicant wishes to mine. They requested that these plants be removed and transplanted nearby. This directive has been captured in the EMPr.*

- *The local community indicated that the grave sites located near the dolerite koppie would need to be protected from mining activities. They are concerned that mining activities would desecrate this location. The community have requested that a sturdy fence be erected around the grave sites and a gate installed for access by members of the community. Further signage and demarcations must be erected to make the area visible to vehicles and employees. This directive has been captured in the EMPr.*

- *Stakeholders (Government Departments & Municipalities) had no concerns about potential impacts stemming from mining activities on the existing cultural, socio-economic or biophysical environment.*

7.2.5 Other concerns raised by the aforesaid parties.

- *No other concerns were raised by the aforesaid parties.*

7.2.6 Confirmation that minutes and records of the consultations are appended.

- *All the above parties have been consulted. Please see letters and proof of public meeting provided in consultant component of the appendix section of this mining application.*

7.2.7 Information regarding objections received.

- *No objections have been received.*

7.3 The manner in which the issues raised were addressed.

- *The majority of the issues raised by the local community during the public participation process had already been addressed in the Ecological and Biodiversity Screening Assessment, Heritage Impact Assessment Report and the Riparian Delineation Report. If the recommendations and directives captured in these documents are adhered to during the operation of the mine, it is unlikely that indigenous important vegetation species and the grave sites will be negatively impacted upon by the mining activities.*

8 SECTION 39 (3) (c) of the Act: Environmental awareness plan.

8.1 Employee communication process

(Describe how the applicant intends to inform his or her employees of any environmental risk which may result from their work).

8.1.1. ENVIRONMENTAL AWARENESS TRAINING

OBJECTIVES

The Applicant or Site Manager must ensure that adequate environmental awareness training of senior site personnel takes place and that all employees receive an induction presentation on the importance and implications of the EMPr no shorter than 2 hours in duration prior to the commencement of mining operations. The Applicant/Site Manager must submit a proposal for this environmental awareness training to the EAP for approval. The Environmental Induction must ensure that all mining employees:

- *Understand the key environmental features of the Site and surrounding environs and the kind of activities that impact on them;*
- *Are thoroughly familiar with the environmental management measures contained in this EMPr and the environmental protection requirements as they apply to the mining site.*
- *Are trained in the identification of archaeological artefacts and flora and fauna of special interest that may occur on site and the measures that must be applied when they are encountered, and*
- *Are fully aware of all rules regarding general behaviour on site e.g. littering, noise, toilet behaviour, etc.*

The presentation must be conducted, as far as is possible, in the employees' language of choice. The presentation will involve the use of pictures and real-life examples as these are more easily remembered by employees.

TARGETS

All employees that work on the mining site must have received environmental awareness training, are informed of, and apply the codes of conduct and required management measures indicated in the Ecological and Biodiversity Screening Report, Heritage Impact Assessment and the EMPr. Regular follow up training sessions must be arranged.

MANAGEMENT AND MITIGATION

It is the Applicant or Site Manager's responsibility to ensure that all people involved with the project receive environmental awareness training before starting work on site. This must include all new staff recruited during the preparation phase. A signed register must be kept of each employee attending the course. Regular follow up training sessions must be arranged.

Environmental awareness training must include but not be limited to the following:

- *Awareness-raising of how different mining activities can impact on the environment, why it is important to avoid environmental damage and what steps can be taken to mitigate the impacts of mining activities.*

- *Identification of possible archaeological or historical objects and the requirement to notify the Applicant or Site Manager immediately if such an object is found, and to be informed of 'No Go" areas of cultural heritage. The EAP and Heritage Specialist must be notified of these discoveries immediately.*

- *General conduct on site such as noise levels (e.g. shouting and hooting), alcohol consumption, drug use, toilet behaviour, littering, no firearms, no pets, no harvesting of firewood / plants, no trespassing or damage to property, no throwing of cigarette butts into the veld etc. Please see attached Employee Code of Conduct below:*

- *Emergency procedures and incident reporting.*

- *Location of fire-fighting equipment and its use.*

- *Eco-sensitve areas as No Go areas.*

The Applicant or Site Manager must maintain a record of all employees that have received Environmental Awareness Training and must monitor the performance of the mining employees to ensure that the points that were relayed during their induction have been understood and are being followed. If required, a translator may be requested to explain aspects of the environmental requirements or acceptable social behaviour that are unclear. Consideration must be given to the feasibility of introducing fines for workers who transgress the rules e.g. littering, use of the veld as a toilet, damage to property, etc.

8.2 Description of solutions to risks

(Describe the manner in which the risk must be dealt with in order to avoid pollution or degradation of the environment)

All employees must adopt a proactive approach to deal with environmental issues encountered during mining operations, rather than adopting a reactive approach. Please see the documents Mining Phases and Potential Impacts and Mitigation Measures for Different Phases of Mining Operations provided in the environmental component of the appendix section of this Mining Permit Application for details related to the manner in which risks must be dealt with in order to avoid pollution or degradation of the environment.

8.3 Environmental awareness training.

(Describe the general environmental awareness training and training on dealing with emergency situations and remediation measures for such emergencies).

Please see 8.1 above for a description of the general environmental awareness training employees must receive prior to commencement of mining operations. For a description on the training employees will receive to deal with emergency situations and remediation measures for such emergencies please see below:

All employees must be briefed regarding the requirements for dealing with potential emergencies, including fires, accidental leaks and spillage of pollutants and crime perpetrated on or near the mining site. Education of employees must focus not only on the prevention of emergencies but also on proactive and appropriate interventions where such emergencies occur.

- *All employees must be aware of the correct emergency contact numbers (police, ambulance etc) for the area they are working in. This will be addressed as part of the presentation presented to the employees. Employees will be told where to find the correct emergency contact numbers while on the mining site – signs, notice boards etc.*
- *All employees must know the Applicants/Site Manager contact details for emergencies.*
- *The Applicant/Site Manager must draw up detailed emergency procedures for fires, spillages of hazardous waste, incidents of crime and other emergency situations. For example:*
    - *In the event of a fire, employees must first try to contain the fire without posing unnecessary risks to them. As soon as it looks as if the fire may get out of control, appropriate emergency personal must be contacted.*
    - *In the event of a hydrocarbon spill, the source of the spillage must be isolated, and the spillage contained. The area must be cordoned off and secured. Contaminated soil must be removed and disposed of.*
    - *All alien vegetation clearing teams must be aware of the emergency procedures associated with spills or leakages of herbicides while out in the field. These include how to isolate the source of the leakage or spillage, how to cordon off the affected area, locating and utilisation of absorbent materials and the numbers of relevant local authorities that must be notified of such spills and leakages.*

9 SECTION 39 (4) (a) (iii) of the Act: Capacity to rehabilitate and manage negative impacts on the environment.

9.1 The annual amount required to manage and rehabilitate the environment.

(Provide a detailed explanation as to how the amount was derived)

9.2 Confirmation that the stated amount correctly reflected in the Prospecting Work Programme as required.

10 REGULATION 52 (2) (h): Undertaking to execute the environmental management plan.

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises EIA and EMP compiled in accordance with the guideline on the Departments official website and the directive in terms of sections 29 and 39 (5) in that regard, and the applicant undertakes to execute the Environmental management plan as proposed.	
Full Names and Surname	Mr Andrew Batho
Identity Number	8505125077081

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