

DRAFT ENVIRONMENTAL MANAGEMENT PLAN



**PREPARED FOR:
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SURFACE OWNER

G.J. Hawkins, but in the process of selling the land to the applicant.

TITLE DEED DESCRIPTION

T5340/2003 – Portion 61 (a portion of Portion 3) of the Farm 648, Buffalo City Local Municipality, Division of East London

REGIONAL SETTING

The study site is situated approximately 14 km west of East London town centre and 46 km east of King Williams Town. Eureka suburb is approximately 600m south-west from the site, whilst Dawn residential area is located approximately 950m south-east. Wilsonia Industrial Area is located 750m south-east. Property owner's residence is located 470m south-west whilst the nearest abutting properties are located 500m and 600m to the north-east and north-west respectively. The R102 and gravel access road, connecting the proposed mining site with East London and King Williams Town, are located respectively 900m and 530m to the south and east respectively.

Access to the site and various farms is via a gravel road leading from the R102 (Voortrekker Street) to the south. The site is situated in a rural area surrounded by farms with residential and industrial areas outside a 500m radius. There are no overheads (e.g. a power line, telephone line servitude, etc) in the proposed quarry area.

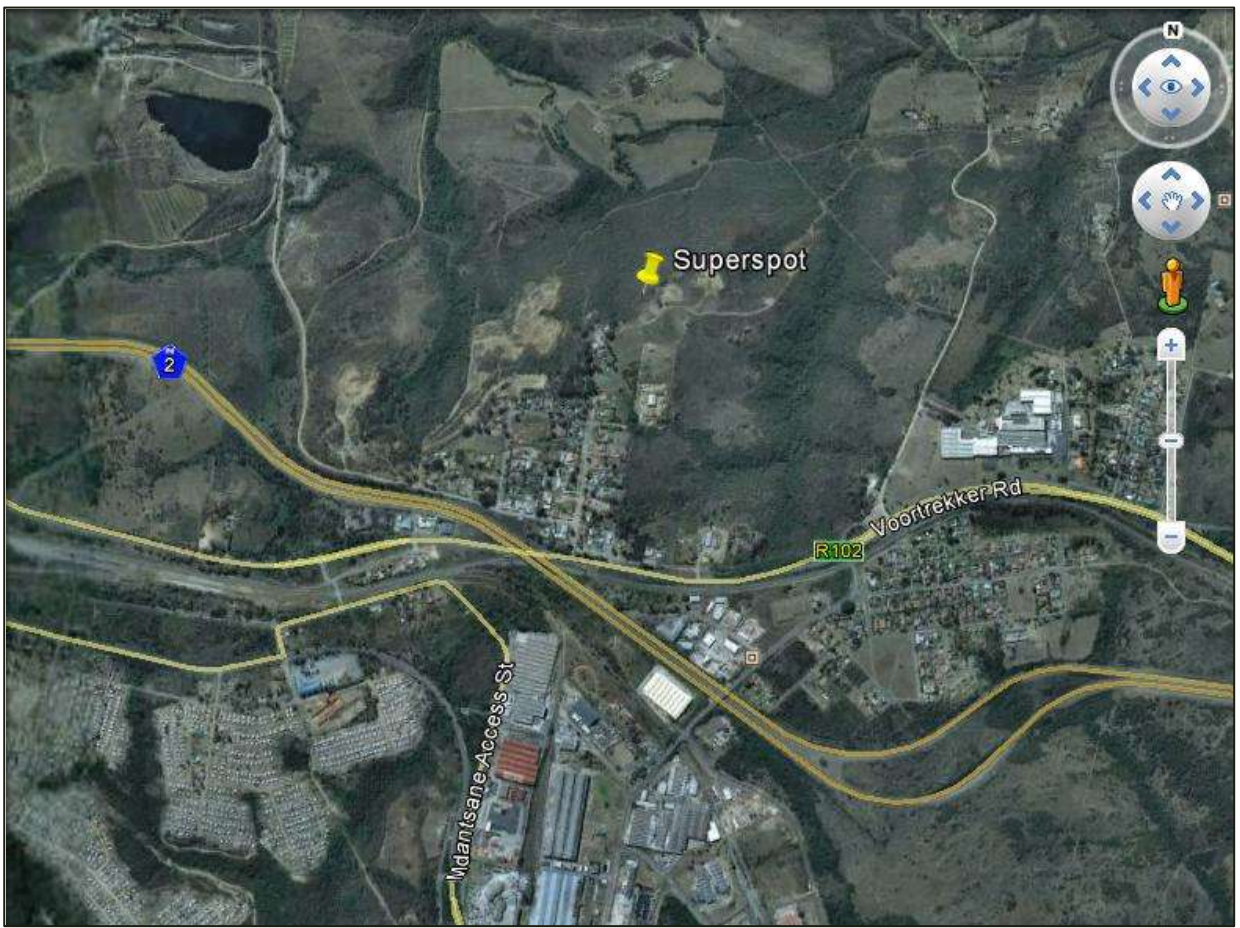


Figure 1: Locality Map

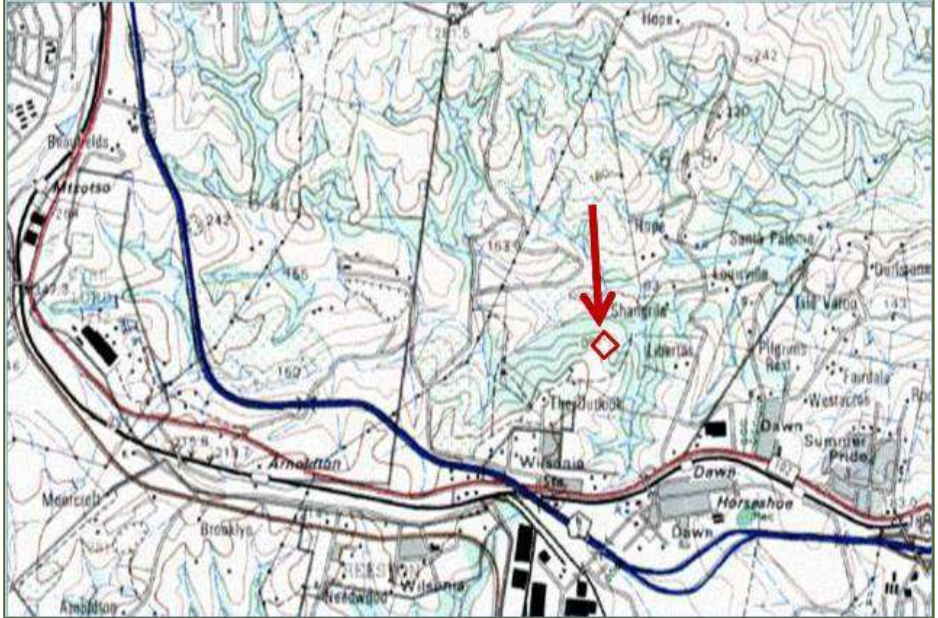


Figure 2: Regional setting

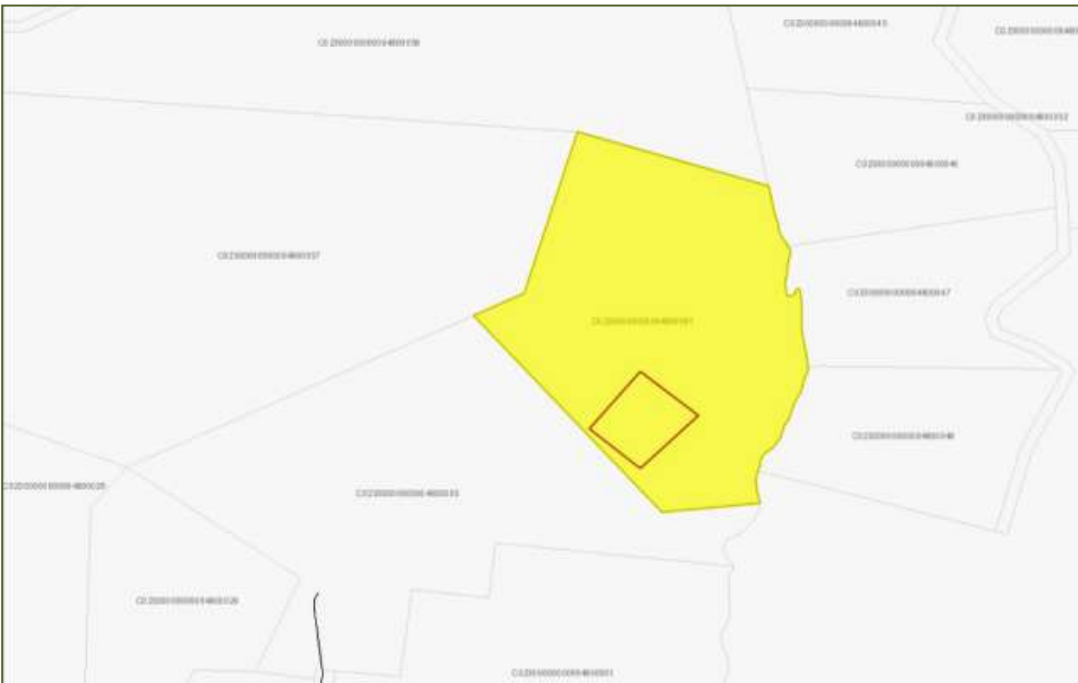


Figure 3: Mining area in relation to property boundaries (Between 10-30m from south-western boundary)

LAND DESCRIPTION / INFORMATION

SURROUNDING AREAS

The site is surrounded by mostly transformed land. To the east PPH Hire is mining weathered dolerite and is in the final phases of the development. To the west is an abandoned quarry that was not rehabilitated. To the south of the site is the urban development of East London: residential areas, industrial sites, shopping centers, etc. To the north are small farms with areas stripped to make way for grazing and small crop farming. There are small patches of intact vegetation in drainage lines and in between small farms. However, mostly the surrounding area has been transformed.

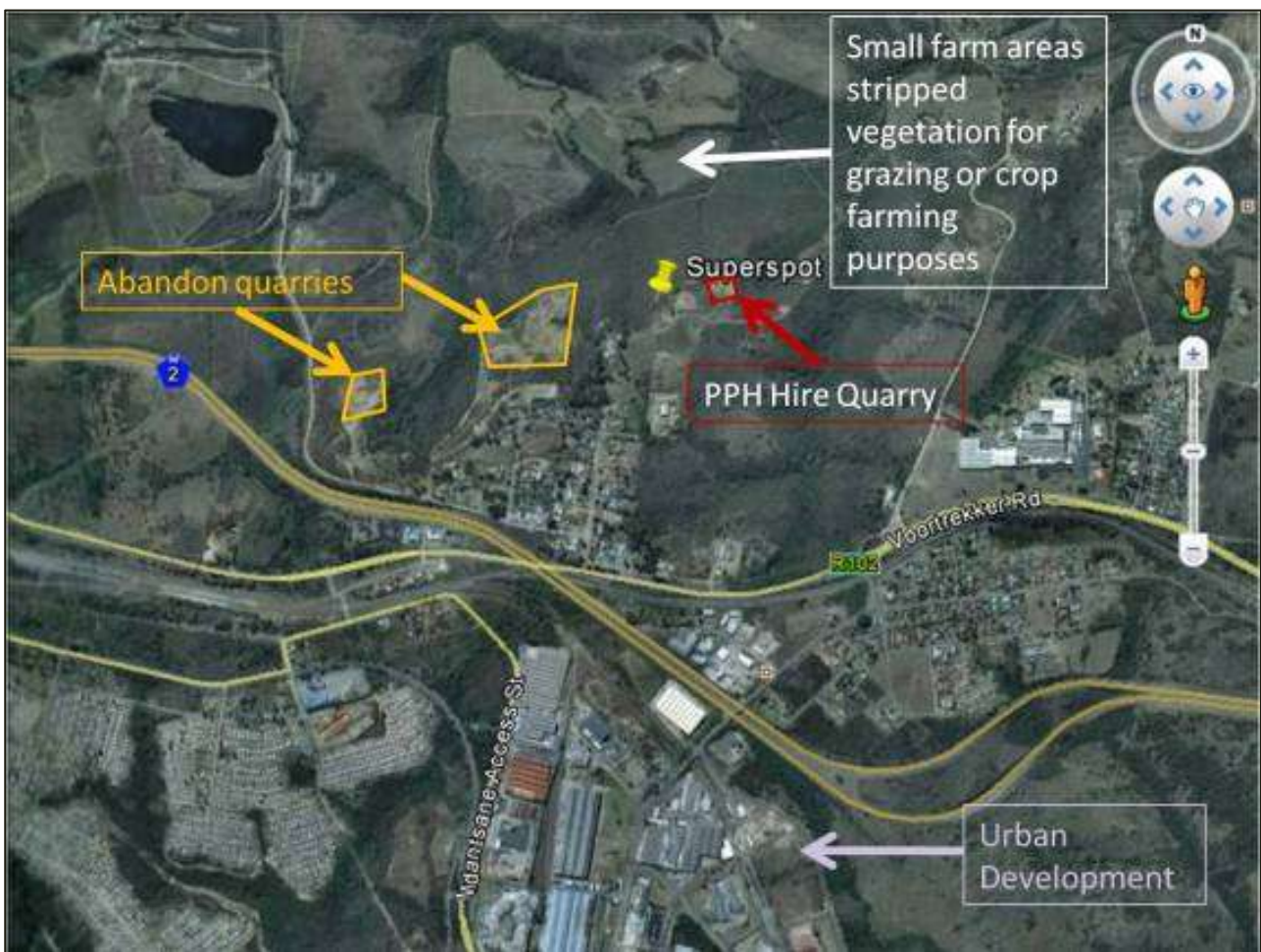


Figure 4: Surrounding area

MINE AREA

There is an existing access road to the proposed mining site but needs to be maintained as it also provides access to various farms. Alternatively the access road that leads to the PPH Hire site can be used as this proposed site is situated adjacent to the PPH Hire site but this access road is on a steep incline and needs to be upgraded.

The gravel road links up with Voortrekker Street (R102), south of the site. The property is fenced and a gate secures the site. Material obtained from the site will be suitable to use for the upgrading of the access road and public gravel road, however maintenance on the public road must be done only in correspondence with the District Roads Engineer. The access road will however not be wider than 4m and will consist of a single lane. No labor accommodation or campsite will be established on site.

The proposed quarry will be a private concern licensed by the Department of Mineral Resources. Material will be extracted from the crest of this weathered dolerite hill by means of excavation to a height of approximately 30-40m. Material will be excavated and stockpiled. The mining objective would be to commence mining on the northern perimeter and then progressively cut into the hill in a southerly direction.

A mobile office and a chemical toilet to prevent the surrounds being used for ablutions) will be brought to site. No crushing plant will be erected onsite and the material will be carted directly to the markets.

PRESENCE OF SERVITUDES

There are no servitudes registered in the proposed quarry area, but an Eskom Power line runs north of the site and the access road along the servitude will be upgraded.

EXISTING LAND USES THAT IMPACT ON THE ENVIRONMENT IN/OUTSIDE THE PROPOSED MINING AREA

- N2 & R102 to the south that increase noise and emission levels in the area.
- Abandon mining to the west which was not rehabilitated that resulted in the removal of vegetation, aesthetic deterioration and spread of alien vegetation.
- Current mining to the east, however rehabilitation is still in process, but still currently causing a visual impact and aesthetic deterioration.
- Build up areas to the south and south-west causing increase in run-off, waste/litter production removal of indigenous vegetation and water pollution.
- Surrounding agricultural practices like ploughing in the valley areas north of the site, that could cause increased run-off and siltation of stream environments.
- Establishment of informal/formal rural settlements to the south that impacts on the aesthetics and tranquility of the area and increase waste streams and run-off volumes. Poverty in this area causes a substantial impact on remaining wild life through dog hunting and snaring.

ZONING

Current zoning is agriculture and although mining is seen to be a temporary change of land use, the Municipality might request a temporary change in land use application to be made.

REGIONAL CLIMATE

Climatic conditions such as temperature, rainfall and wind velocity influence for example plant growth, erosion levels of disturbed areas, dust generation and air pollution levels as well as social impact in terms of quality of life. Climatic conditions can therefore influence the significance of impacts caused by developments such as mines. It is therefore important to understand the role thereof when determining the impacts of a specific development and the remedial measures that need to be implemented.

Climatic data was obtained from Schultz and Kopke as well as from the institute of Soil Climate and Water. The study site falls into the Southern Temperate Climatic Zone and can therefore be considered mild with strong winds and occasional periods of high humidity during the high summer months.

RAINFALL

The Eastern Cape Province experiences a bimodal rainfall pattern with pronounced wet seasons coinciding with spring and autumn. These rain periods are frequently associated with northeasterly winds. Spring rains may also be associated with the passage of cold fronts drifting in from the west. Thunderstorm activity is common along the coast in late summer and autumn and result in intense cycles of rain and wind. This is illustrated by the fact that the maximum rainfall recorded in a 24h period for any month is almost double the monthly average. Dry periods are coinciding with midsummer and mid winter. The average annual rainfall for the Province is approximately 873mm.

According to the hydrology maps, the area falls within Hydro Zone S and Rainfall Zone R3A which received between 725 and 875mm rainfall per annum and MAP-MAR response of 6. This will stimulate plant growth and reduce dust generation to some extent. However, it will increase erosion on disturbed and uncovered mine areas and the necessary storm water control measures need to be implemented. East London area receives a summer rainfall and therefore seeding must therefore coincide with early spring and early autumn to ensure a successful re-vegetation phase. Hail, frost or snow is not common phenomena in this area and will not affect the re-vegetation process.

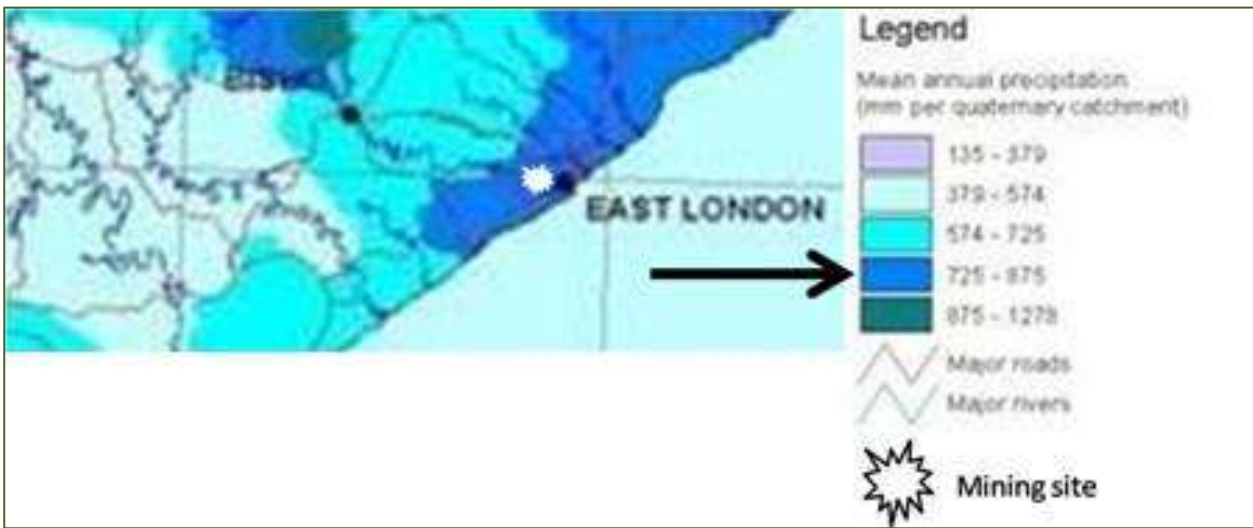


Figure 5: Mean annual precipitation

TEMPERATURE

The area experiences warm to hot summers with maximum temperatures in February and minimum temperatures July. Hot north-westerly berg winds may occur in winter and may last for a few days, usually preceding cold fronts. From the statistics it is essential that seeding be restricted to the warmer periods to achieved optimum germination and growth. The annual evaporation of the area totals approximately 1400mm with the highest evaporation rates associated with the summer months.

WIND REGIMES

The prevailing wind directions are predominantly west and east-north-east but with significant easterly, north-easterly, south-westerly and northerly components. Winds are mostly aligned with the coast during the summer months. The north-easterly winds decreases from April when the south-westerly winds become more pronounced. Wintertime is dominated by south-westerly winds and north-westerly winds. Strong winds above 5m/s occur in more than 30% of the year with calms approximately 10% of the year. The calms are mostly restricted to the summer months and then well to nighttime. The average wind speeds are moderate with 50% of the winds reaching speeds between 1.5-5.5m/s. The calms can for example result in the concentration of dust near ground level at night. Wind erosion is also an environmental parameter that needs to be controlled when sandy soils are predominant, whilst it would have a lesser effect when well-developed soils such as weathered dolerite soils are predominant.

According to the Environmental Atlas Potential of the Eastern Cape (EAPEC) the relief of the greater area can be described as a mixture of flat areas and undulating hills with steeply incised watercourses and rivers and can be classified as: Highly Dissected Hills. To the south of the mining area the landscape flattens out slightly and gives rise to buildup areas of East London, which through undulating hills, eventually lowers to sea level along the coast. To the north, east and west the land becomes increasingly undulating with the wilderness area becoming fully manifested to the further northern areas (past the small farmers) towards the Nahoon valley, which is characterized by deeply incised river valleys.

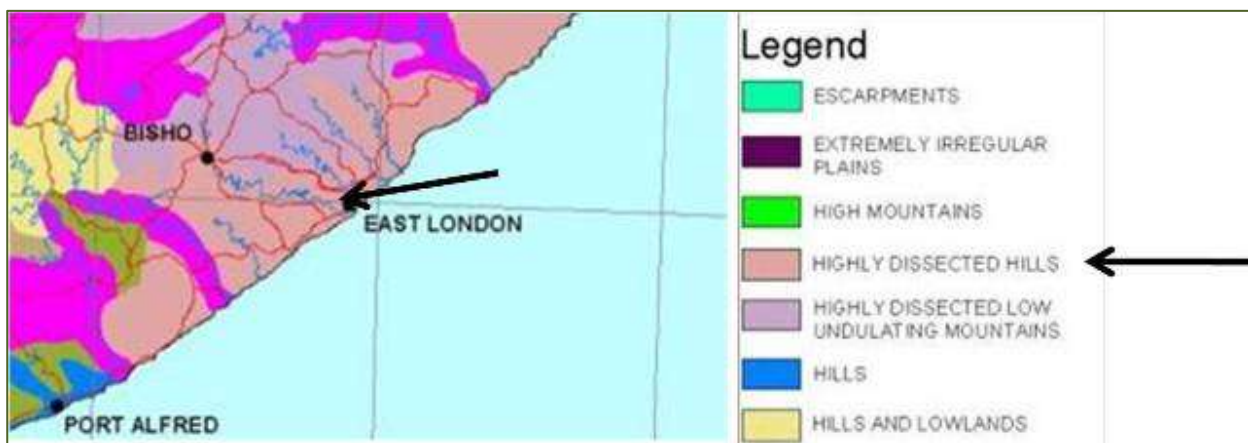


Figure 6: Terrain Morphological Units Map

The mining site is situated on one of these steep hills that characterize the area. The hill has a down slope of about a 1:3 gradient towards the north and a drainage line runs south-east of the site. Mining will result in developing face heights between 6m-8m and the width of the platforms will not be less than 16m. Once the ensuing platforms are developed, the vertical faces will be profiled and the slopes and platforms stabilized by the establishment of vegetation cover and construction of storm water drains.

GEOLOGY

A sequence of sedimentary rocks such as mudstones, sandstones and shales of the Beaufort Group and Karoo Supergroup underlie the East London area. The Karoo Sequence was intruded by dykes, sills and inclined sheets of dolerite during the Jurassic period. Dykes are generally 3-10m wide and several kilometres long, mostly with a west-north-west-east-south-east orientation. Sills, as

represented in study area, are generally discordant and often undulating. Thickness varies from 1m to over 100m. In the thinner sheets and in the dykes, the texture is usually porphyritic, whilst in the thicker bodies it is ophitic and rock type varies from olivine dolerite through tholeiite to granophyre. Dolerite outcrops are poorly represented in surface outcrop in the East London area and most of the time dips at both steeper and shallower altitude than the surrounding sediments. Through chemical weathering this rock, in most cases, produced thin to thick layers of weathered dolerite, depending on the weathering factors involved, and constitute the target mineral.

Mining of Sabunga (weathered dolerite) will cause the accumulation of large boulders, which will be blasted and crushed during the mining operation or could be utilized in the rehabilitation process.



Figure 7: General geology of the area

SOILS

Soil is a complex mixture of eroded rock, mineral nutrients, decaying organic matter, water, air and billions of organisms, most of them microscopic decomposers. Soil forms when life-forms decay, when solid rock weathers and crumbles, and when sediments are deposited by erosion. Mature soils are arranged in a series of zones called soil horizons, each with a distinct texture and composition that vary in different types of soils. A cross-sectional view of the horizon in a soil is called a "soil profile". Most mature soils have at least three horizons.

Colour indicates a lot about how useful a soil is for growing crops. For example, dark brown or black topsoil is nitrogen rich and high in organic matter. Grey, bright yellow or red topsoils are low

in organic matter and will need enrichment to support most crops. The average size of the spaces or pores in a soil determines soil permeability, i.e. the rate at which water and air move from upper to lower soil layers. Soil permeability is also influenced by soil structure: how soil particles are organised and clumped together. Soils vary in their contents of clay (very fine particles), silt (fine particles), sand (medium size particles), and gravel (course to very course particles). The proportion of the different sizes and types of mineral particles determines the soil texture. Loam soils which are comprised of roughly equal mixtures of clay, sand silt and humus, are the best soils for growing most crops.

Calcareous soils are those that contain free calcium carbonate and can also be regarded as alkaline soils. The term "dystrophic" refers to an imbalance in nutrients. Dystrophic soils are therefore soils that are rich in humus, giving them a brown colour. They have variable amounts of nutrients and are sometimes depleted of oxygen owing to the high concentration of humus. The term "leaching" refers to a process whereby various soil components are dissolved by water moving through the upper layers, carrying the dissolved material to lower layers. Highly leached soils are those where most of the nutrients, etc. have been leached from the upper layers.

SOIL PROPERTIES

Topsoil is a very precious, non-renewable resource with high conservation importance and is necessary for the effective rehabilitation of disturbances caused by development. The potential of soils to rehabilitate is defined by its depth, structure, texture, and sequence of soil horizons. It is therefore essential that where it occurs it be preserved and protected and if necessary obtained from outside sources to effect proper rehabilitation of disturbed areas.

The intricate landscape with its mosaic of landforms in conjunction with the geology and climate set the platform for soil development in the area. The plains and hills are the result in the difference in resistance to weathering of the underlying lithological units. In general the area overlaying the mining site and surrounds falls within an area where soils can be described as soils with a marked clay accumulation, strongly structured and a reddish colour. The site falls in an area classified as: Depth: Moderate deep soil; Texture: Clayey and loam; Relief: Undulating.

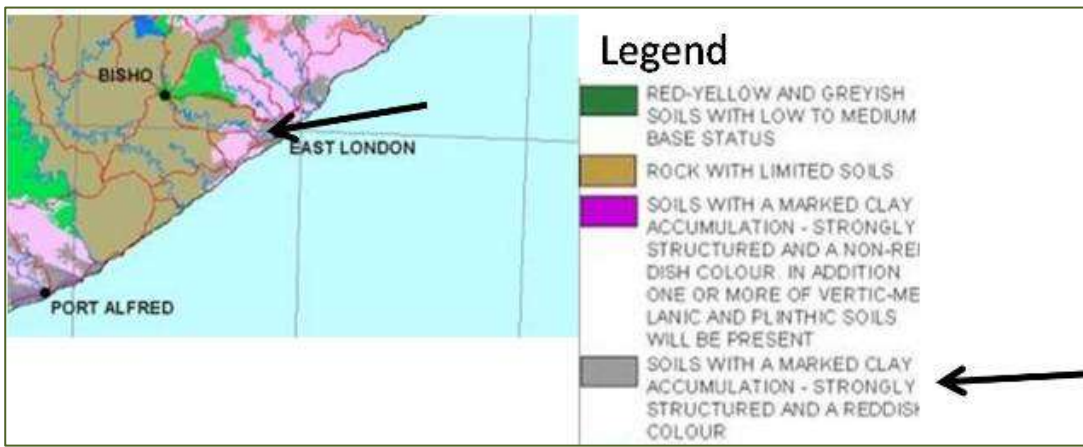


Figure 8: General soil description



Figure 9: Soil depth

SOIL EROSION

Soil properties determine the erodibility of soils and their ability to support vegetation. Soil erosion is a natural process, which, without disturbance, would balance itself with the formation of new soil. However, any development that destroys the natural protective canopy of vegetation speeds up the process of soil erosion. Understanding the erosion potential of soils, will assist in assessing the potential impact erosion might have on re-establishing vegetation. Soils susceptible to water erosion are normally silty, are weakly structured, have low organic contents and have poor internal drainage.

The erodibility index is determined by combining the effects of slope and soil type, rainfall intensity and land use. These aspects are represented by terrain morphology (soil and slope), mean annual rainfall and broad land use patterns.

The topsoil at the site is coarse textured and can be generally described as a clayey loam with a low erodibility factor of between 11-15. Under normal circumstances this soil is stable and not

subject to erosion. The area falls within sediment yield region 9 with a quaternary sub-catchment yield of 39 000 tons per annum, supporting the low erodibility factor.



Figure 10: Erodibility Index

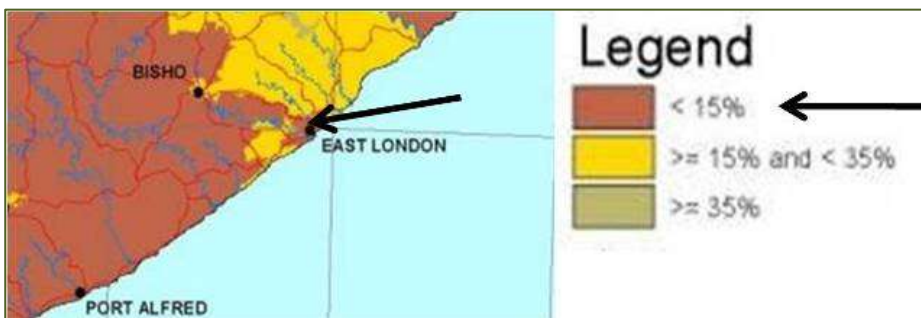


Figure 11: Clay Classes of topsoil

LAND USE AND LAND CAPABILITY

Although land use is not a feature of the environment as such, it does represent the current status of the land surface as a whole, and therefore also reflects the condition of the environment. Land use is reflected by land use patterns, based on terrain morphological units.

Conservation is the maintenance of environment quality and resources or of a particular balance among the species present in a given area. The resources may be physical, biological or cultural. Conservation must be seen as a land use. It is an action that people take to dedicate a piece of land for a specific use, whether it is for the use as a monument, for the breeding of animals, or as a habitat for animals.

In terms of EPAEC (Environmental Potential Atlas for Eastern Cape) the land is categorized as Built-up land and zoned agricultural. At the site, past disturbance was clearly noted as the vegetation shows a grass cover with establishing thorn trees, compared to the thick Subtropical Transitional Thicket vegetation in the drainage line next to the site. This indicates that the original vegetation was cleared to establish a grass unit, common to this area, for most likely grazing purposes. Due to

the established thorn trees and other secondary pioneer plant species, it is also indicative that this area has not been used as a grazing unit over the past few years as slowly the original vegetation is re-establishing through natural succession. The site however remains covered with a secondary grass cover. Thus the land on which the mining area is situated on is currently dormant.



Figure 12: General description of the land use

FLORA

Vegetation plays an important role in maintaining ecosystems, stabilizing soils, maintaining the aesthetics of an area and in providing income for landowners. When development is anticipated the vegetation structure therefore needs to be analyzed, rare or endangered plant species must be identified and economic value of plant cover must be determined. Vegetation structure is mostly determined by the geology and climatic factors and the Eastern Cape coastline represents a climatic transition between the temperate rainfall region to the south and west and subtropical rainfall region to the east and a variable geology. This results in a diverse range of plant communities, characteristic of Cape Flora and subtropical flora.

CONSERVATION STATUS

The original vegetation of the area is classified according to Acocks as Coastal Forest and Thornveld. The forest of the coast-belt may be divided into five types: The Typical Coast-belt Forest in Natal and the Transkei; the Zululand Palm Veld; the Transitional Coastal Forest in the area between the Kei and Keiskamme; the Dune Forest; and the Mangrove Forest.

The mine area specifically falls within the Transitional Coastal Forest area, which is a dense, almost impenetrable woody thicket and is specie rich when undisturbed, as can be found in the drainage line running south-east of the site.



Figure 13: Thick, impenetrable thicket of the drainage line.

It is transitional in terms of phytochorological components and includes species with Tongaat-Pondoland, Afromontane and Karoo-Namib affinity and occurs at altitudes between 30m and 800m a.m.s.l. The Transitional Coastal Forest is very similar to the drier part of the typical forest except that it lacks such species as *Macaranga capensis*, *Croton sylvaticus* and *Schefflera umbellifera*, while *Ptaeroxylon*, *Schotia* spp. *Cassine* spp. and *Euphorbia grandidens* tends to be more common and *E. triangularis* sometimes occurs, showing that it is transitional to the drier Alexandria Forest.

Structurally it is dominated by evergreen and semi-evergreen sclerophyllous shrubs and trees and has a low to mid-high closed or near-closed canopy. Normally an herbaceous field layer of forbs and grasses is present. The specific type found on site is Mesic Kaffrarian Ticket dominated by non-succulent shrubs and trees. This thicket type was renamed to Albany Thicket. The conservation status is Least threatened. About 12 % of the Albany Coastal Belt has been altered by cultivation, 1% by plantation forestry and 4% by urbanisation. The vegetation type is under some pressure and apparently 20% has been transformed and 18% has been degraded. Therefore only 62% remains intact and the conservation status is leaning towards 'vulnerable'. Erosion in this vegetation type is deemed to be low to moderate. However, in terms of the National Biodiversity Strategy launched by the Department of Environmental Affairs and Tourism no definite strategy is in place for conservation of Albany Thicket on private land.

The more dominant species are:

Tall Tree: *Erythrina caffra*.

Small Trees: *Acacia natalitia*, *Brachylaena elliptica*, *Canthium spinosum*, *Cussonia spicata*, *Ficus sur*, *Ochna arborea*, *Sideroxylon inerme*, *Zanthoxylum capense*.

Tall Shrubs: *Clausena anisata*, *Clerodendrum glabrum*, *Coddia rudis*, *Croton rivularis*, *Oiospyros villosa* var. *parvifolia*, *Grewia occidentalis*, *Gymnosporia heterophylla*, *Hippobromus pauciflorus*, *Mystroxydon aethiopicum*, *Pavetta lanceolata*, *Psydrax obovata*, *Pterocelastrus tricuspidatus*, *Rhus lucida*, *Scutia myrtina*, *Tarchonanthus camphoratus*, *Turraea obtusifolia*.

Low Shrubs: *Rhynchosia ciliata*, *Carissa bispinosa* subsp. *bispinosa*, *Chaetacanthus setiger*, *Helichrysum asperum* var. *albidulum*, *Pelargonium alchemilloides*, *Phyllanthus maderaspatensis*, *Selago corymbosa*, *Senecio pterophorus*, *Tephrosia capensis* var. *acutifolia*.

Semi parasitic Epiphytic Shrub: *Viscum obscurum*.

Woody Succulent Climbers: *Crassula pellucida* subsp. *marginalis*, *Sarcostemma viminalis*.

Woody Climbers: *Asparagus aethiopicus*, *A. racemosus*, *Capparis sepia* var. *citrifolia*, *Clematis brachiata*, *Rhoiacarpos capensis*, *Rhoicissus digitata*, *R. tridentata*, *Secamone alpin;*' *Tecoma capensis*"

Herbaceous Climbers: *Rhynchosia caribaea*, *R. totta*, *Thunbergia capensis*, *Zehneria*

Graminoids: *Brachiaria serrata*, *Cynodon dactylon*, *Dactyloctenium australe*, *Digitaria natalensis*, *Ehrharta calycina*, *Eragrostis capensis*, *E. curvula*, *E. plana*, *Heteropogon contortus*, *Panicum deustum*, *P. maximum*, *Setaria sphacelata*, *Sporobolus africanus*, *Themeda triandra*, *Tristachya leucothrix*, *Cymbopogon marginatus*, *Ehrharta erecta*, *Elionurus muticus*, *Melica racemosa*, *Setaria megaphylla*, *Trachypogon spicatus*.

Succulent Herb: *Plectranthus verticillatus*

Geophytic Herbs: *Cheilanthes hirta*, *Moraea pallida*, *Oxalis smithiana*, *Sansevieria hyacinthoides*, *Strelitzia reginae*.

Herbs: *Chamaecrista mimosoides*, *Abutilon sonneratianum*, *Acalypha ecklonii*, *Centella asiatica*, *Commelina africana*, *C. benghalensis*, *Cynoglossum hispidum*, *Eriosema squarrosum*, *Lactuca inermis*, *Lobelia erinus*, *Mansonia emarginata*, *Phyllopodium cuneifolium*, *Senecio burchellii*, *Sonchus dregeanus*.

Endemic Taxa

Succulent Shrub: *Bergeranthus concavus*.

Succulent Herbs: *Brachystelma franksiae* var. *grandiflorum*, *Bulbine frutescens* var. *novo* ('*chalumnensis*' Baijnathined.), *Faucaria subintegra*, *Haworthia coarctata* var. *tenuis*, *H. cooperi* var. *venusta*, *H. reinwardtii* var. *reinwardtii* f. *chalumnensis*, *Stapelia praetermissa* var. *luteola*, *S. praetermissa* var. *praetermissa*.

Geophytic Herbs: *Bobartia gracilis*, *Apodolirion amyanum*, *Aspidoglossum flanaganii*, *Drimia chalumnensis*.

Low Shrub: *Acmadenia kiwanensis*.

Herb: *Monsonia galpinii*.

These plants listed constitutes an important source of vegetation for browsers and is therefore of significant importance to support especially buck species.

This vegetation type is quite resistant to external impacts but once disturbed it does not recover over the short or medium term. It mainly reproduces through vegetative means hence it is important that all material removed be worked back into the soil to resprout, if the site is not invaded by alien vegetation.

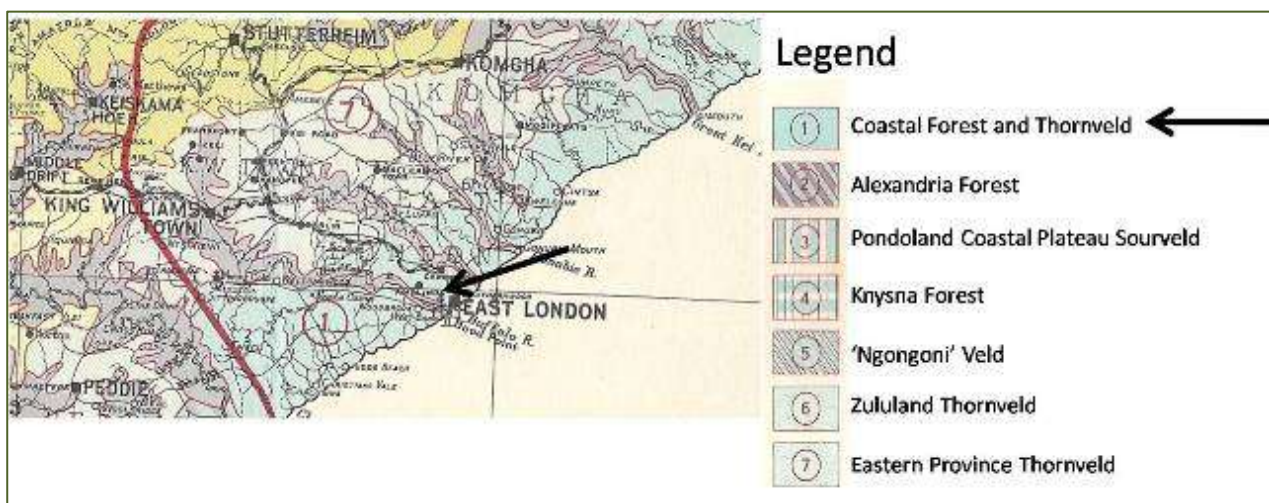


Figure 14: Vegetation classified as Coastal Forest and Thornveld

FAUNA

Animals play an important role in maintaining ecosystem functioning for example pollination, spreading of seeds, removing of pests, trimming of vegetation and therefore determining penetrability of vegetation and generation of manure etc.

The original thicket habitat poses a definite ecological niche for animal species since the canopy provides adequate forage, nesting place and protection for avian fauna whilst the under storage provide adequate protection and forage for browsers. The site is also close to the Nahoon valley where wild life still occurs.

In terms of the broad EMPAT assessment (Environmental Potential Atlas for South Africa) the site could host a low to moderate number of sensitive faunal species as depicted in the relevant maps but would definitely be restricted to the areas not used for mining activities.



Figure 15: Sensitive bird species



Figure 16: Sensitive mammal species



Figure 17: Sensitive reptile species



Figure 18: Sensitive butterfly species

However, the surrounding areas have been severely transformed due to previous abandoned mining, current mining, farming and urban development resulting in wild animals becoming increasingly scarce since these developments would have caused most wild animals in this area to move towards areas which are more secluded. The very close proximity to the informal settlements, where poverty is a definite threat and dog hunting and poaching in this area is extensive, results in wildlife becoming even scarcer. Also, the site was previously disturbed and removed all the original species and currently only host grass land and thorn trees. Due to these limited resources that this area offers, original species diversity is low.

WATER

SURFACE WATER

The mining site falls within the larger Keiskamma River Catchment.

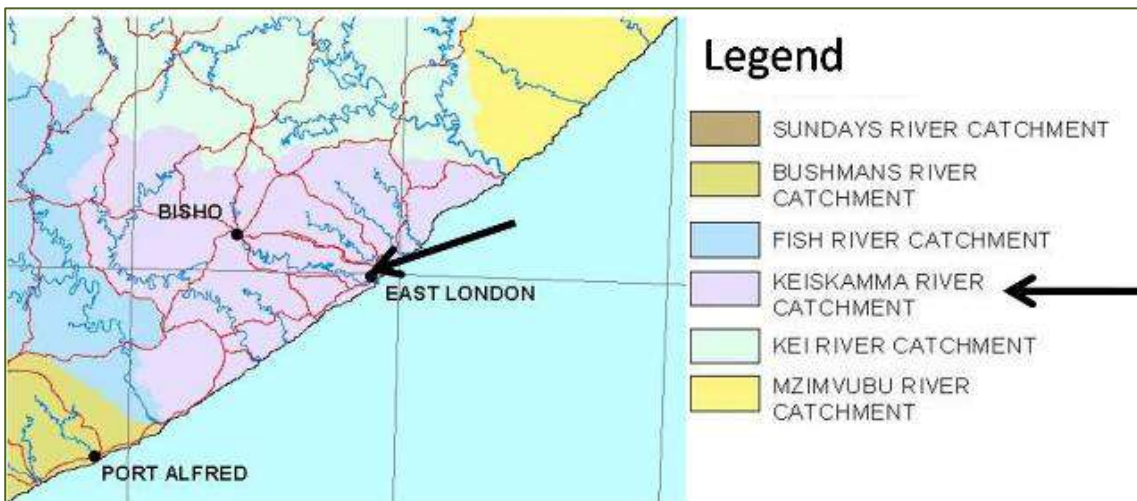


Figure 19: Catchment area

The Keiskamma River is approximately 263 km long with a catchment area of 2 745 sq. km. About 11% of the Keiskamma catchment is under agriculture. Most of this comprised subsistence farming and commercial forestry with some temporary commercial irrigated agriculture. Approximately 27% of the catchment is degraded, comprising mainly degraded grassland and bushland. Roughly 57% of the Keiskamma catchment is natural and consisted primarily of bushland, grassland and forest with some scrubland also present. Urban development accounts for approximately 5% of the catchment land-cover and this comprised mainly residential development (South African Estuaries: Catchment Land-cover).

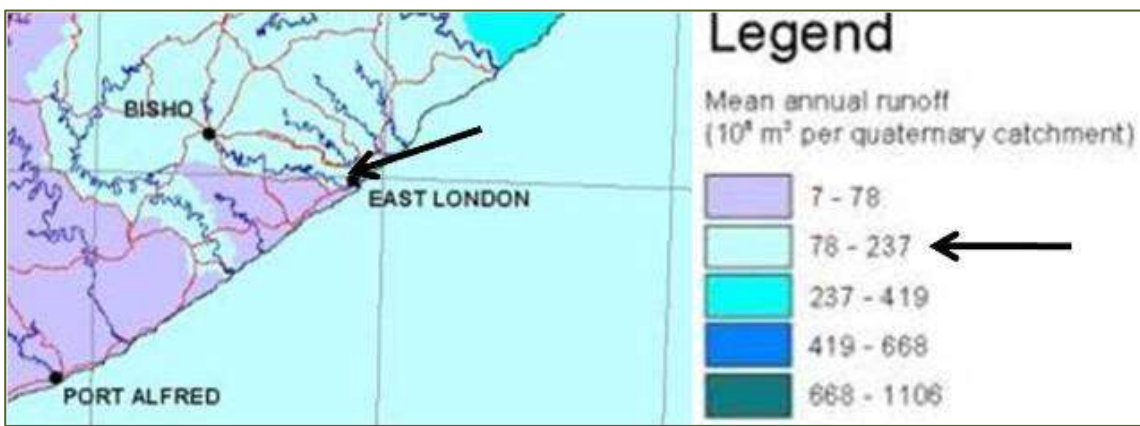


Figure 20: Catchment runoff: The Keiskamma Catchment area received between $78\text{-}237 \times 10^5 \text{ m}^3$ mean annual runoff.

Mean annual runoff varies from $78\text{-}237 \times 10^4 \text{ m}^3$ per quaternary catchment. The site is also located in quaternary sub-catchment R30F and is administered under the Water Management Area: Umzimvubu to Keiskamma.

GROUNDWATER

The main groundwater aquifer in this area is restricted to the sandstones and contact zones between the sandstones and dolerite intrusions. Dolerite is not normally a water bearing rock. However, due to the high permeability of the weathered dolerite and the thickness thereof, perched aquifers will developed through infiltration and downward percolation of water, especially at the contact zone with the mother material.

AIR QUALITY

The air quality of the mine area is intermediate due to the fact that the site is sandwich between the semi-rural northern valleys and the severely disturbed, urban southern areas. The gravelly material *per se* is not a harmful substance and should not cause any discomfort to people. The amount of dust generated on a mining area is directly linked to the type of material that is extracted, mechanical processes involved, traffic volumes, and wind speed and soil moisture content. The finer the material (more easily airborne) and the higher the clay and silt concentrations the more severe is the impact. The dryer the soil becomes the more dust it generates. Dust fall out at the site will be depended on the mechanical processes and the clay and silt content of the topsoil.

NOISE

The impact of noise levels generated by mining activities is determined by the time of day, the consistency thereof, distance to people, whether it is a low or high-pitched noise and whether beneficiation is taking place. Noise levels are more intense in the morning and evening than during the rest of the day and are more irritating if it is high pitched. The more continuous the noise is the higher the impact. In terms of SABS standards noise levels for rural residential areas are 45dB during the day, 40dB in the early evening and 35 at night. Noise impact is rated against the following: 1) The average person will be able to just detect a noise increase of 2dB, 2) An increase in noise levels between 2-5 will result in no or sporadic complaints from communities whilst an increase between 5-10dB will result in widespread complaints, 3) An intruding noise is defined by National Noise Regulations as disturbing if it causes the ambient noise levels at the border of the property from which it emanates to increase with 7dB, 4) An average person will perceive such an increase in the ambient noise levels as a doubling of noise levels and very strong response will be expected from communities/residents.

During the mining operation, noise levels at the mine boundary should be kept below 60 decibels during the day in order not to cause any unacceptable disturbances.

WASTE

Mining can generate various different kinds of waste, depending on the mine activity. These include: building rubble, industrial waste, domestic waste, mine residue, sewage, hydrocarbons, and scrap metal. Some or all of these could potentially impact on the environment if mitigation measures are not followed.

VISUAL IMPACT

Originally, the landscape would have been described as very attractive and of high aesthetic quality. However, due to previous mining the current landscape can be described as low-moderately attractive with low aesthetic quality. Onsite assessment of immediate landscapes revealed that the proposed mine is bordered by semi or completely transformed land for the majority of the area.

TRAFFIC IMPACT

The existing road network will be used and could be upgraded to facilitate the trucks. The public gravel road that connects with the Voortrekker Road (the R102) will be used to gain access to the site. Any development that adds heavy vehicles to a road system will have an impact on the structural integrity of the roads and might also cause safety hazards for other motorists and road users. The severity of the impact will depend on the existing structural status of the roads prior to mining and the amount of heavy vehicles per hour added to the road systems. Safety risks for other motorists and road users will depend on the road etiquette maintained by truck drivers and implementing safety precautions.

SOCIO-ECONOMICAL IMPACT

It is very important for any mining application to consider the social impacts, whether it is beneficial or harmful to the surrounding community. Economically, mining may provide some form of economical growth in the area, but socially may increase the impacts listed above, which could result in nuisance factors suffered by the community members.

SITES AND STRUCTURES OF ARCHAEOLOGICAL AND CULTURAL INTEREST

These sites represent the heritage of communities and are therefore protected in terms of current legislation. In addition all material/buildings older than 60 years are protected. If the mining site is situated within an archaeological rich area, the impact could potentially be high. If the mining site is situated within a cultural rich area, or community members utilize this area for medical or ritual purposes, the impact could also be high.

PARTICIPATION OF THE COMMUNITY/LANDOWNER/IAP'S

The landowner was consulted, but he is in the process of selling the land to the applicant and has therefore not raised any objections or comments. All the abutting neighbours were consulted with a detailed letter, providing background information regarding this project. Opportunity was given to the neighbours to list their concerns and to date no comments have been received. A full report can be viewed under the heading 'Public Participation' and in Appendix B of this document.

MAIN MINE DEVELOPMENT ACTIVITIES/PLAN

The total mine area comprises about 1,5 ha and the depth will not go below the 140 contour line hence the quarry floor will remain above any perched aquifer that might occur in the area.. Mining will be restricted between the 140m a.m.s.l. and 176m a.m.s.l. contours. The proposed operation would be continuous and working hours will be from 7.30 am to 5 pm five days a week with cessation of activities at 1 pm on Saturdays if the company requires mining over the weekend.

The quarry will be developed using conventional open cast mining method, by excavating the weathered dolerite and establishing benches.

At the site a container with a lid would be placed on the north-eastern corner of the bottom platform for the storage of household waste. A chemical toilet will be provided at the mine area, and will be placed on the same area. Since no crushing plant will be housed on site and due to the nature of the fill material required only the soft material will be used whilst any larger stones or boulders will remain onsite and neatly stacked against the southern face to reduce slope heights and slope gradients.

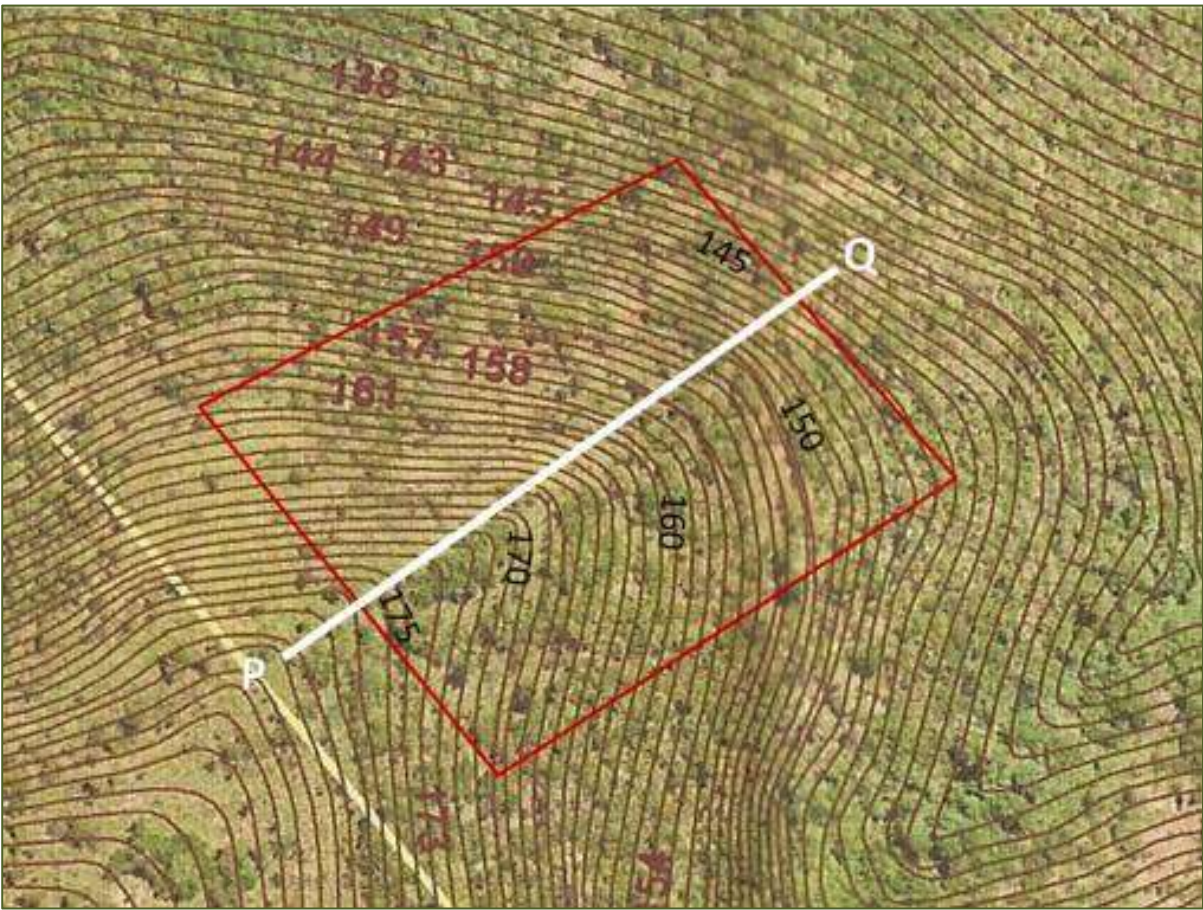


Figure 21: Contours at the site: P-Q cross section

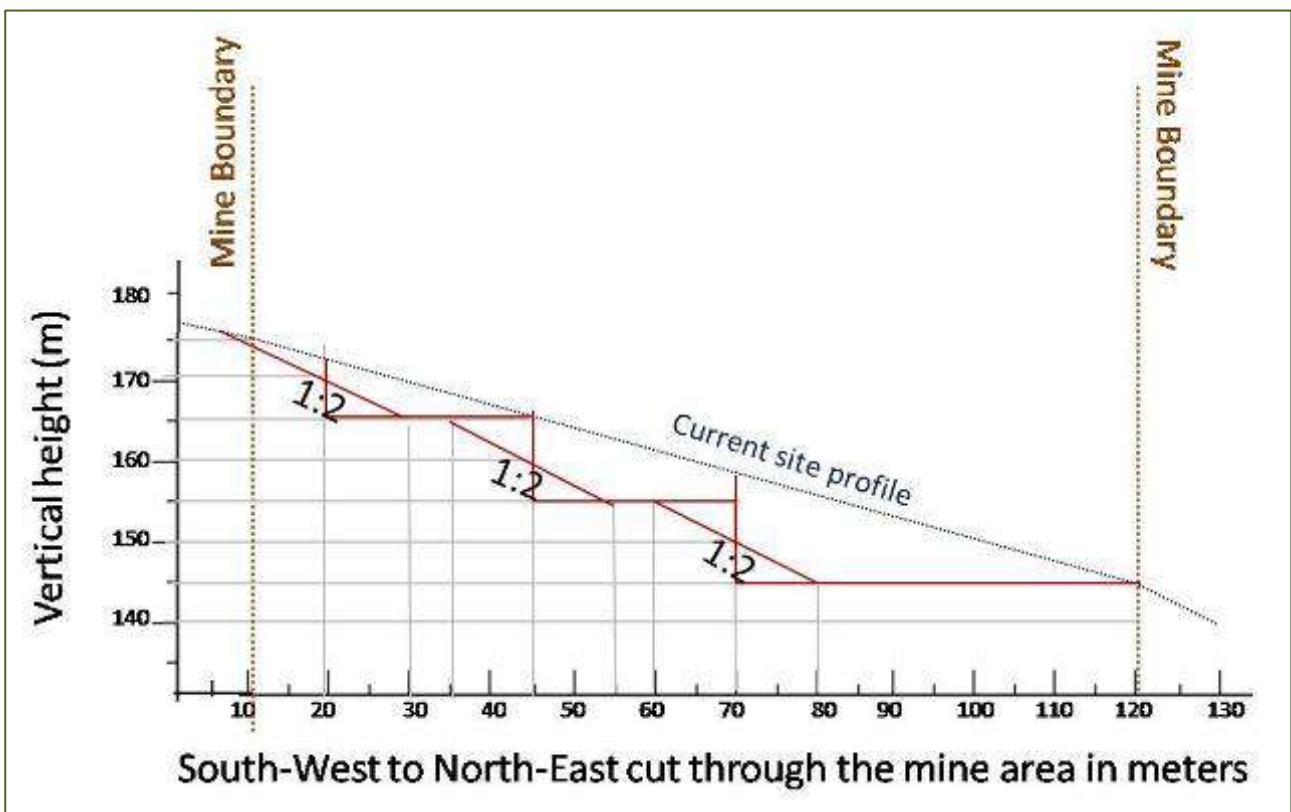


Figure 22: Bench development

Mining will commence on the north-eastern perimeter and then progressively cut into the hill in a south-westerly direction. The first bench will advance the northern face along the 145m a.m.s.l. for about 50m, which will be the first platform, and a face of 12m high will be created.

Topsoil of the first bench will be stripped prior to excavation and stored on the north-eastern boundary of the site for later use. The rest of the topsoil will be stripped and stored on the northern and southern boundaries.

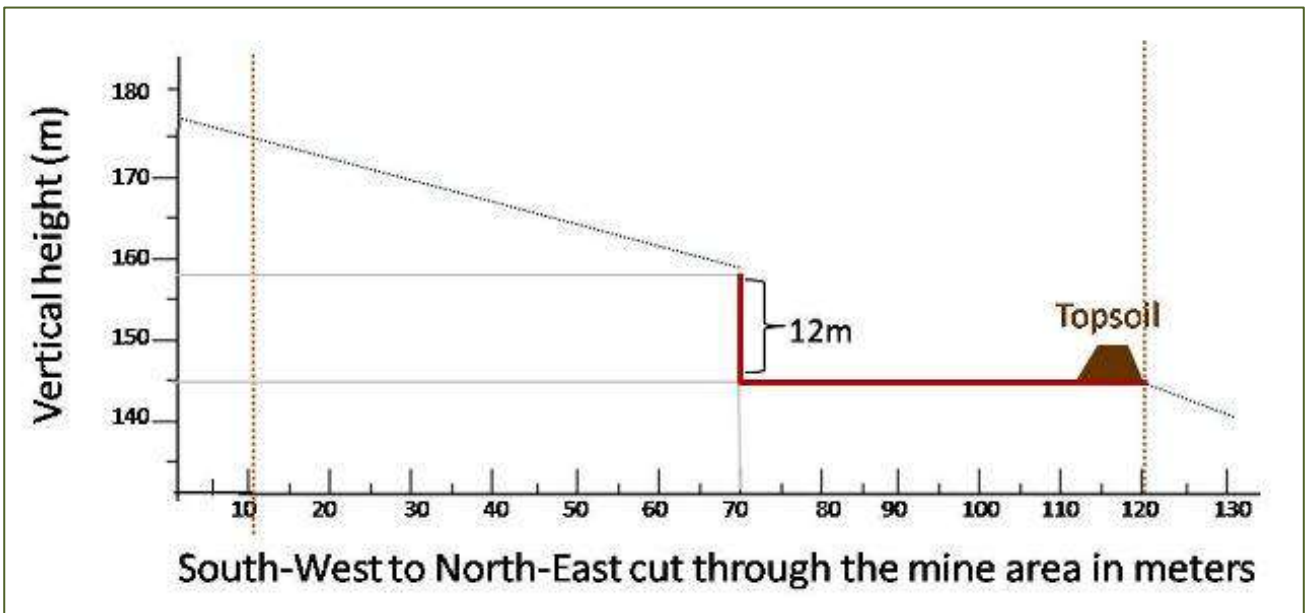


Figure 23: Development of the first bench: P-Q cross cut

As mining progress towards the second bench, the 12m high face will be cut on the 155m a.m.s.l., and thus ultimately creating a 10m high face, of which the front 10m of this bench will then be cut and material will fill the bottom section to create a 1:2 slope.

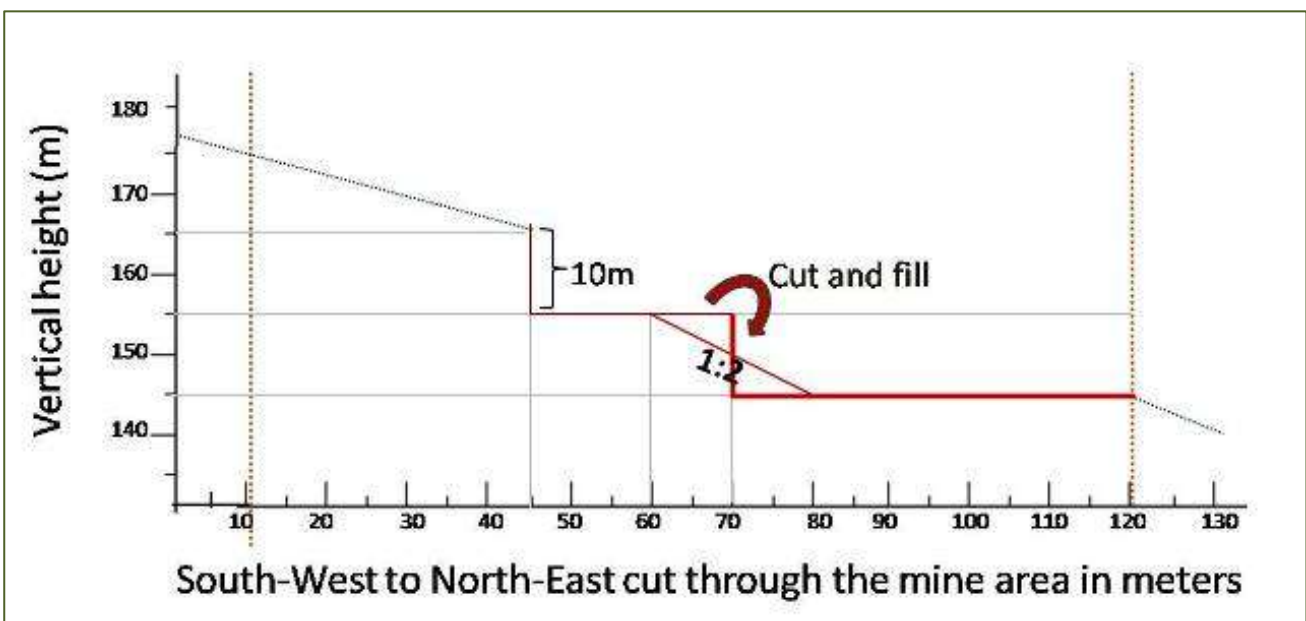


Figure 24: Development of the second bench

The second bench will advance the face further south-west to create a second platform of about 25m along the 155m a.m.s.l., creating a second face of 10m high, due to the current landscape. As mining progress towards the second bench development the first bench can be rehabilitated.

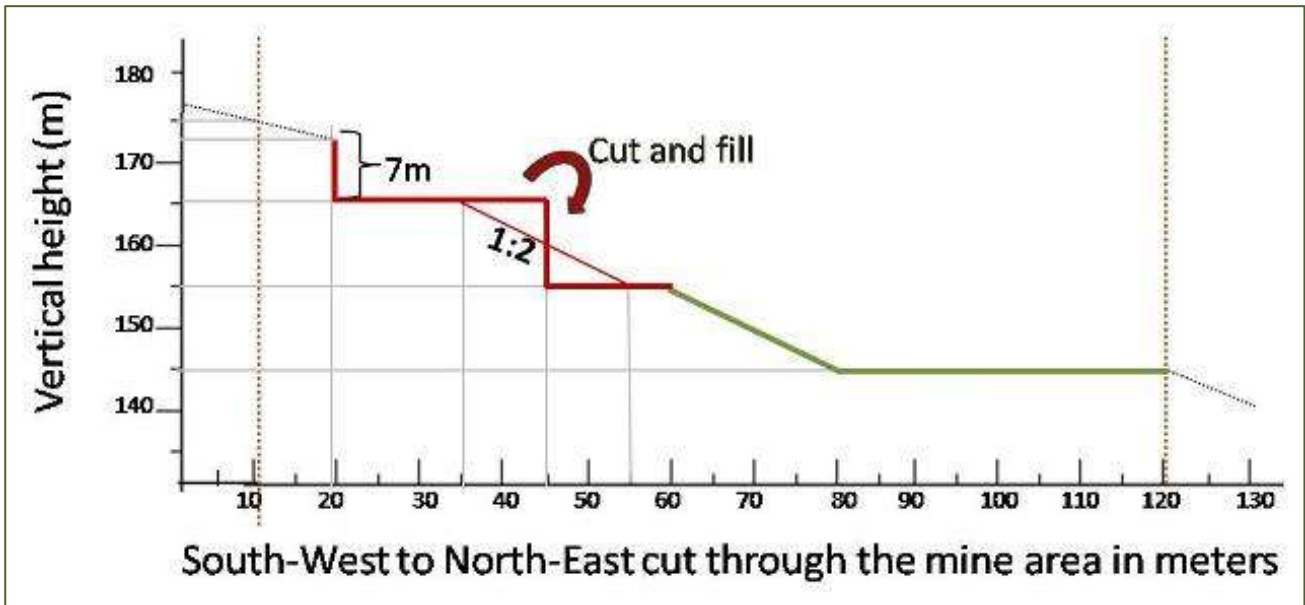


Figure 25: Development of the third bench

The third and final bench will advance the face further south-west to create a third platform of about 25m along the 165m a.m.s.l., creating a third face of 7m high. The front 10m of the second bench will then be cut and material will fill the bottom section to create a 1:2 slope. Once the face is sloped, the second platform and slope will be rehabilitated.

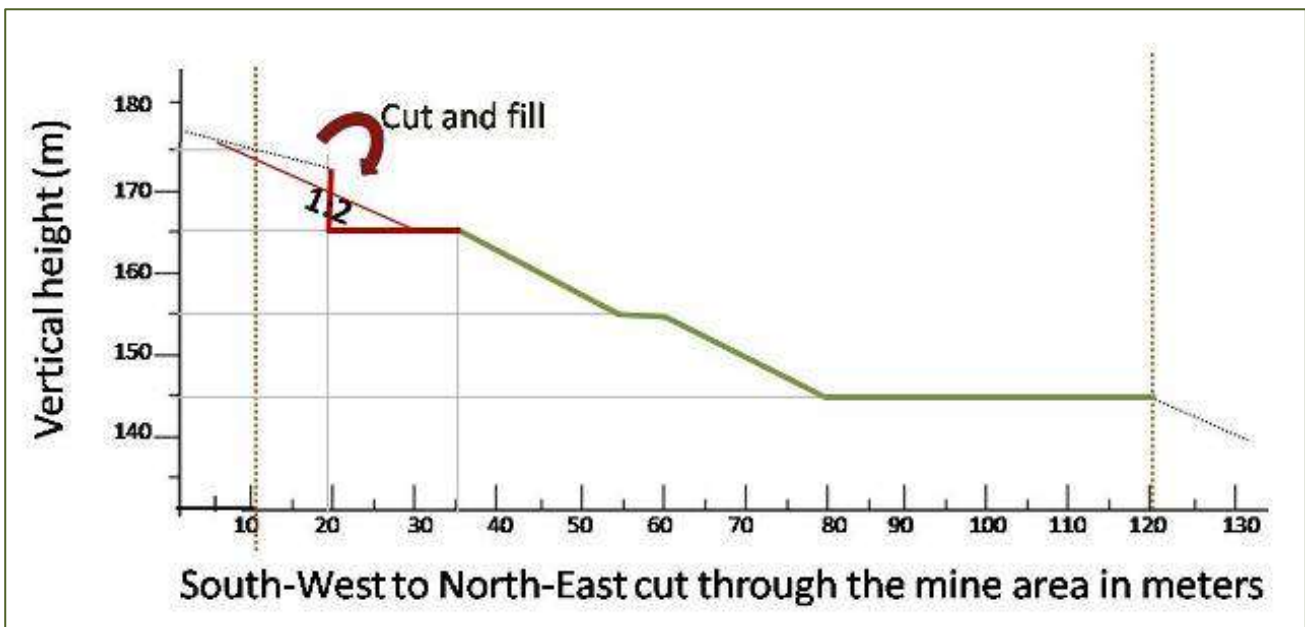


Figure 26: Sloping of the final bench

The mine boundary will also be sloped and the front 14m of the top of the site (south-western boundary) on the 175m a.m.s.l., will be cut and material will fill the bottom section to create the final slope with a gradient of 1:2 slope. Tolerance of 4m beyond the mine boundary will be given to provide adequate space for profiling to ensure that the slope is not too steep for effective rehabilitation.

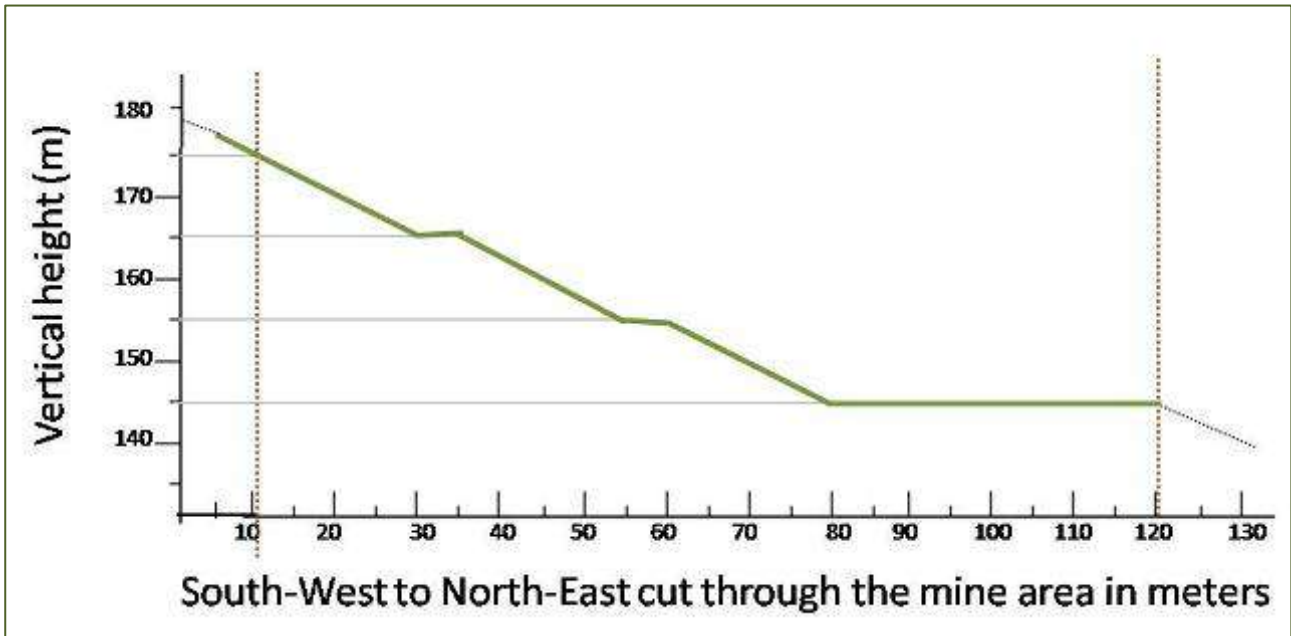


Figure 27: Final Profile

This development will then ultimately result in the establishing of 3 platforms. The first platform will be the largest with a total width of about 40m along the 145m a.m.s.l. the second and third platform will have a total width of about 5m along the 155m a.m.s.l. and the 165m a.m.s.l. respectively.

The quarry floor will remain above any perched aquifer and no water accumulation will occur in the mine area. The proposed development will foster increased runoff and silt transport rates therefore proper storm water control measures must be implemented and maintained.

Thus, runoff of water will be a problem, due to the height and length of the slopes and the potential impact that erosion may have on slope stability, therefore proper erosion and storm water control will be implemented and managed. During heavy rains, the storm water run-off will be curbed on the platforms and will naturally be either absorbed through the vegetation established on the platforms or drain into diversion drains. During the construction phase a diversion trench ahead of the top-upper production face will be constructed to divert runoff away from the mine area once it is in operation.

Each platform must be slightly sloped to have a 1:20 gradient towards the south-west or next bench and the southern end of the platforms (area prior to the rising of the next slope) must be shaped to curve this section of the platform to the north and south so that storm water will be diverted off the platform, into the diversion trench and into the drainage channels next to the site. In addition, once rehabilitated, the platforms will then help reduce the run-off on the sloped areas because: 1) it will be seeded to act as the energy breaker and absorb water, as well as 2) prevent storm water to spill over the bench/slope into the next bench.

The diversion trenches or earth drains on each platform will be constructed as the next bench is developed and will be 20cm deep and 60cm wide. Inside each drain small rock heaps acting as energy dissipaters should be positioned every 20m. Monitoring will take place throughout the lifetime of the mine to ensure that the mining operation does not cause erosion in the drainage areas.

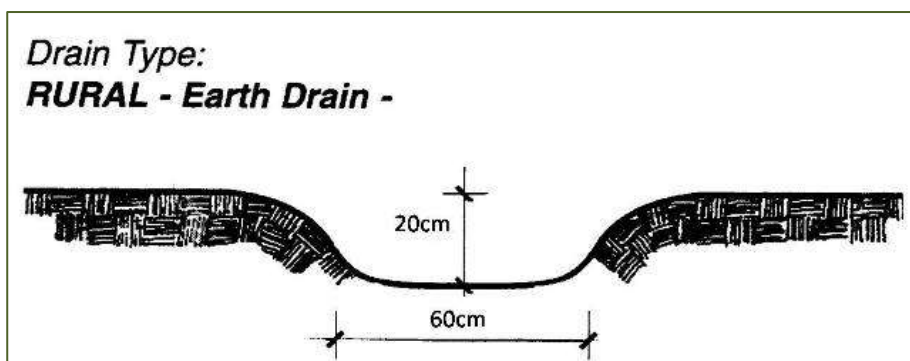


Figure 28: Diversion trenches or earth drains

Once the material is extracted, the quarry area will resemble a box-cut into the landscape, with three platforms areas.

Potable water would be brought to site daily by workers. No maintenance yard will be established since all vehicles will be maintained off site.

MINERAL DEPOSIT & MINE PRODUCT

Weathered dolerite.

Estimated reserves on the property concerned are in excess of between 50 000 – 70 000 cubic meters, these reserves would be mined out within two years, depending on the market. Should it be found that demands increase, an application for renewal of the permit will be considered to obtain the rest of the estimated reserves.

PROSPECTING/ALTERNATIVES

The area east of the proposed site has already been extensively explored by previous mining. The site provided for a substantial amount of weathered dolerite material. These previous mining activities are indicative of the mining potential of the area and the adequacy/quality of weathered dolerite reserves, which in turn proves the economic sustainability of the project. The study area hosts the same quality material that is found on the previously mined area. This information negates the need for prospecting results to motivate the proposed venture.

CONSTRUCTION PHASE

- The excavation perimeter will be demarcated by means of fixed beacons.
- Topsoil from the quarry area will be removed in phases ahead of the production face (bench development), positioned on the sides of the face, except for the first platform area, where topsoil will be stored on the north-eastern boundary. Topsoil stockpiles will be shaped and seeded to reduce the visual impact thereof.
- Post the necessary warning/hazard signs on the mine perimeter.
- Provide for cut-off drain ahead of the mine area on the south-western boundary which will spill into the silt traps and then diverted to the drainage lines to the south and north of the site.
- The chemical toilet will be positioned on the north-eastern end of the mining area.
- The necessary road signage according to the specification of the DRE, will be posted 150m on both sides from the public gravel road.
- The access road will be constructed through clearing vegetation not wider than 4m, grading and placement of an appropriate wearing course. The road will be provided with cross and mitre drains to divert the run-off into the well vegetated areas to the west of the road. Topsoil removed will be positioned along the road for future rehabilitation purposes.
- Potable water will be stored in an appropriate receptacle and be trucked in from East London.
- Considering that at most 15 persons would work on site, no permanent waste disposal site will be established. Container with proper lids would be positioned on the north-eastern end of the mining site for the storage of any household waste. For the duration of the project a skip will also be positioned here and waste receptacles will be emptied in the skip of which the latter on a regular basis will be emptied at the waste facility in East London.
- No office or workshop will be constructed or provided at the site. No housing will be provided as the workforce would not reside on the mine, but will commute to work every day.

OPERATIONAL PHASE

The proposed quarry will be a private concern licensed by the Department of Mineral Resources. Material would be extracted by means of excavator to different heights depending on the benches, but ranging between 10-7m, that will be sloped. Mining will commence as per mine development plan and material will be removed bench by bench through conventional excavating methods and catered to the market.

A few small mineral stockpiles will be created and topsoil stockpiles will be created within the excavation area. Concurrent rehabilitation will also take place as mining progress and advancing the phases will be done with the final closure profile in mind. Once mining has exhausted all the material, the closure phase will be entered.

DECOMMISSIONING PHASE

- The container and equipment will be demolished/removed.
- All scrap metal/dysfunctional parts and waste will be removed to an approved waste/recycling facility.
- All hydrocarbon waste and contaminated soil will be safely transferred to appropriate receptacles, and removed to a hazardous waste site or recycling company.
- Storm water control structures will be repaired and maintained.
- All material stockpiles will be removed from the site, or returned to the quarry void.
- Any access material or overburden will be used to profile the production faces.
- Reintroduce topsoil, fertilize, rip the entire area, seed, scarify and irrigate.
- Oversize boulders will be stashed against the base of the vertical faces prior to profiling the slope.
- Perimeter of the excavation will be trimmed and profiled to the prescribed slopes through cut and fill method to achieve safety requirements and to blend the quarry with surrounding landscape.
- If stability of material on the benches is a challenge, it could be considered to position anchored gabions (1m wide and 1m high) on the edge of each profiled bench to retain material.
- Spread topsoil to a depth of at least 30cm over overburden and scarify lightly to key it in with the sub-layer.
- Apply fertilizer and mulch, and seed entire area.
- All equipment, waste of scrap metal will be removed from site.

LISTED ACTIVITIES IN TERMS OF NEMA

This activities associated with this mining operation does not trigger any listed activity in terms of NEMA.

ENVIRONMENTAL IMPACT ASSESSMENT CRITERIA

The impacts of the mining operation on the environmental parameters are assessed in this section in accordance with the criteria of the Minerals and Petroleum Resource Development Act 28 of 2002 and section 21, 22 and 26 of the Environmental Conservation Act. The process will highlight the impacts and emphasized the importance of remedial measures over the short term as well as post extraction. Impacts were assessed according to the criteria listed below:

Extent Whether the impact will occurs on a scale limited to the immediate site of the proposed activity, local area and immediate communities and settlements, sub-regional (municipal), regional (provincial) or national scale

Spatial extent: None/Insignificant **(0)**, Site **(1)**, Local **(2)**, Sub-Regional **(3)**, Regional **(4)**

Duration Whether the time span of the impact will be short term (0-5 years), medium term (5-15 years), long term (in excess of 15 years) or permanent where natural processes or mitigation processes cannot eliminate the impacts.

Duration: None **(0)**, Short Term **(1)**, Medium Term **(2)**, Long Term **(3)**, Permanent **(4)**

Intensity (Magnitude) Whether the size of the impact is low, medium, high or negligible.

Intensity: None **(0)**, Very Low **(1)**, Low **(2)**, Low-Medium **(3)**, Medium **(4)**, Medium-High **(5)**, High **(6)**, Very High **(7)**

Probability The probability of the impact actual occurring as either unlikely, probable, likely or definite

Probability: None **(0)**, Unlikely **(1)**, Probable **(2)**, Likely **(3)**, Definite **(4)**

These criteria are evaluated in terms of

- Significance (Insignificant-low-moderate-high)
- Status (positive-negative-neutral)
- Confidence (based on academic information, specialist knowledge, site evaluations, applicants approach)

Cumulative Impact: None, Very Low, Low, Low-Medium, Medium, Medium-High, High, Very High

The significance of the impact on the parameters of the affected environment is rated as:

Low Significance The project will not cause any major adverse or beneficial changes to the biophysical, social or economic environment. Impacts experienced will abate almost immediately after cessation of activities and the biophysical, social or economic system should recover and return more or less to the natural state. No expensive mitigating measures will be needed to address any of these impacts. Ecological functions will continue undisturbed and no complaints from Interested and Affected Parties (I&APs) are anticipated. No rare and endangered species or sensitive areas exist in the area.

Moderate Significance The project will induce moderate short to medium term changes to the biophysical, social or economic environment. The impact would be induced outside the development area and also possibly on a sub-regional level. Over the medium term the impacts could fade away but the implementation of mitigation measures are normally required to eliminate these impacts. The impacts would be experienced for some time after cessation of activities but would not affect the biophysical, social or economic environment severely. With mitigation the biophysical, social or economic system should recover but the return to the natural state would be very slow and in some instances may not be achieved. I&APs might express some concerns and complaints may be received on an *ad hoc* basis. Rare and endangered species or sensitive areas may exist in the area and could be marginally affected.

High Significance The project will induce extensive long-term changes to the biophysical, social or economic environment. The impact would be induced outside the development area and also possibly on a regional to national level. The possibility of secondary impacts arising from the project is high. Over the long term the impacts could fade away but the implementation of expensive mitigation measures are normally required to eliminate or mitigate these impacts. These impacts would be experienced after cessation of activities and could affect the biophysical, social or economic environment severely. With mitigation the biophysical, social or economic system could possibly recover but the return to the natural state would be or normally not be achieved. Ecological functions will be permanent disturbed and major complaints from Interested and Affected Parties

(I&APs) could be expected. Rare and endangered species or sensitive areas exist in the area might be critically affected.

Significance: 0-6 = Insignificant; 7-15 = Very Low; 15-22 = Low; 23-31 = Low-Moderate; 32-40 = Moderate; 41-47 = Moderate-High; 48-55= High; above 55 = Very High

The significance weight figures are calculated by adding the spatial extent, the duration and intensity and multiplying that by the probability figure.

Should the impact assessment as a minimum reflect 2-3 impacts of high significance and 2-3 impacts of moderate significance the project shall be viewed as a potentially flawed and continuation of the project should be seriously reconsidered or special engineering or biophysical/social intervention must be implemented.

TOPOGRAPHY

The mining site is situated on a hill with a down slope towards the north-east. The incline from the top of the site to the lowest part of the proposed mine area is a 30m drop over a 110m area from the south-west to the north-east. There is a drainage line to the south of the site that separates this site from PPH Hire quarry.

During the construction phase, no activity will lead to additional transformation of the topography of the site, except in a very small extent the removal and storage of the vegetation and topsoil to prepare the development of the first bench, the construction of the cut-off trench ahead of the development, and the construction of the access road. As no permanent infrastructure within the mining area is anticipated no additional impact on the topography will be applicable. The positioning of chemical toilet and associated infrastructure will result in a temporary, very low, short term topographical interference but will be removed at closure. This interference will be similar to the impacts that farm residences and associated infrastructure pose in the landscape.

Mining will be done in a phase/bench development approach, as per the mine plan to ensure a continuous rehabilitation approach. Mining will ultimately result in the establishment of 3 platforms. The first platform will be the largest with a total width of about 40m along the 145m a.m.s.l., the second platform will have a total width of about 5m along the 155m a.m.s.l. and the final top platform will also have a width of about 5m along the 165m a.m.s.l. The platforms will have a 1:20 gradient slope towards the south-west of the site to allow the runoff from the slopes to collect in the diversion drains and to be diverted into the drainage lines next to the site.

The topography of the mining area will be irreversibly altered since a large portion of the hill will be permanently removed and the terracing of the production faces will also change the appearance of site. Considering the nature of the mining process envisaged the changes to the micro landscape will be acceptable provided the necessary precautionary measures contained in this document be implemented. The impact on the topography is rated as permanent, site specific and of moderate significance in the absence of remedial measures, but of low-moderate significance with remedial measures in place. With time this topographical interference would become less prominent due to natural re-vegetation processes, provided that proper soil horizons are established.

The neighboring mine area is in the final process and should be rehabilitated. Other mine areas further north-west of the site is also under new application and the site should be improved. Thus the cumulative impact on the topography will only increase if this site is not profiled together with the other sites, since cumulatively the disturbed area would enlarge and not fit in with the surrounding area. Since this will be a regulated site, concurrent rehabilitation and profiling will be applicable and the site will be restored to fit in with the surrounding environment, thus the potential cumulative impact will be low.

Impact on topography.

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Site Specific	1	Site Specific	1	Site Specific	1
Duration	Short Term	1	Permanent	4	Permanent	4	Permanent	4
Intensity	Low	2	Low-Medium	3	Low	2	Very Low	1
Probability	Likely	3	Definite	4	Definite	4	Definite	4
Cumulative Impact	Very Low		Medium		Low		Very Low	
Status	Negative		Negative		Negative		Negative	
Confidence	High		High		High		High	
Significance	Very Low	12	Moderate	32	Low-moderate	28	Low	20

During the construction phase, no activity will lead to the permanent transformation of the geology. The impact on the geology during the construction phase is rated insignificant.

During the operational phase mining the weathered dolerite will cause the accumulation of boulders, which will be utilized in the rehabilitation process. Mining will result in permanently removing part of the weathered dolerite layer on this portion of land. Considering the nature of the development the impact is unavoidable. The impact on the geology is thus site specific and permanent and because of the latter, is of higher significance. Weathered dolerite deposits is however not regarded as a strategic mineral and the study area is not a geo-site, and is therefore of less importance. The impact is rated low-moderate.

The cumulative impact might increase slightly in terms of the geology, since mining entails the removal of, in this case, weathered dolerite and the fact that there are areas next to this site that were also exploited, increases the total amount of dolerite material removed in the area. Dolerite mining around the city is slowly depleting available reserves and the cumulative impact in that regard might be considered moderate, but considering the extent of reserves of this deposit; the impact is rated low.

Impact on geology

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Site Specific	1	Site Specific	1	Site Specific	1
Duration	Short Term	1	Permanent	4	Permanent	4	Permanent	4
Intensity	Low	2	Low-Medium	3	Low	2	Very Low	1
Probability	Unlikely	1	Definite	4	Definite	4	Definite	4
Cumulative Impact	Very Low		Low		Low		Low	
Status	Negative		Negative		Negative		Negative	
Confidence	High		High		High		High	
Significance	Insignificant	4	Moderate	32	Low-Moderate	28	Low-Moderate	24

SOIL PROPERTIES

The intricate landscape with its mosaic of landforms in conjunction with the geology and climate set the platform for soil development in the area. The plains and hills are the result in the difference in resistance to weathering of the underlying lithological units.

The soils on the study site has three distinct horizons namely a dark brown, structured, humus rich A-horizon of 40cm-1m thick that constitutes the topsoil that must be preserved. The next layer is a less structured, reddish brown decomposed weathered dolerite layer of 3-10m deep and constitutes the B-horizon and which is the target material. This is followed by the C-horizon of many meters thick and constitutes the solid parent dolerite, which will not be mined.

During the construction phase the topsoil on the cut-off trench ahead of the development, the first bench and platform area and the access road, will be removed and stored, and since concurrent rehabilitation will take place, the storing of topsoil will be short term, until it is replaced on excavated areas and seeded. Thus the impact on the soil property during the construction phase is rated very low.

During the operational phase, topsoil will be stripped and stored bench by bench as mining progresses. The percentage of carbon content will definitely be above 3% and will stimulate and support plant growth well if it is not stored too long since microbial processes will break it gradually down. As a maximum it needs to be used within a year after it was removed. Phosphate and nitrogen content in these soils are normally good and calcium: magnesium ratios should be suitable. The potential of soils to rehabilitate is defined by its depth, structure and texture and sequence of soil horizons. Since the soil found on site has low-moderate internal drainage capacity and higher absorption capacity (water holding capacity) due to the clayey loam soil characteristics, will cause these soils to display most of the time high field capacity values, which is good for retaining biomass accumulation and for rehabilitation, hence the topsoil has the potential to remain fertile after prolonged heavy precipitation. Soils would therefore easily retain its positive nutrient cycles should it be disturbed and be denuded of vegetation. If used shortly after stripping no upgrading would be necessary but after prolonged periods inorganic fertilizers could be mildly applied. Continuous upgrading of soils is therefore not necessary and application of fertilizers more than once per annum is not required. The impact on soil properties is rated low but it should nevertheless be understood that soil fertility, humus content and the ability to sustain plant life would be affected to some extent.

In addition the topsoil is sufficiently deep and has suitable textural and structural features to ensure that it would be easily rehabilitated or is amenable to physical rehabilitation. The topsoil is therefore excellently suited to support plant life as demonstrated onsite and is far better than soils derived from sedimentary rocks.

The subsoil (Sabunga/weathered dolerite) is less structured and not suitably textured since it is still in the process of weathering and would also have much lower nutrient levels and would not readily sustain plant life, but if upgraded with fertilizers and area exposed for long periods to normal weathering it can be used as a weak topsoil. This will facilitate re-vegetation and ensure successful rehabilitation.

Incorrect stockpiling of soil can cause its physical nature to deteriorate and become sterile due to compaction, loss of nutrients, texture and structure, anaerobiosis and decline in biological activity. Soil heaps may therefore not exceed 2m and must be vegetated immediately.

The neighboring mine had stripped the topsoil and is in the final phase of the development and will replace the soil in the near future. Thus the cumulative impact will most definitely increase if this site and the neighboring site is not rehabilitated, but since both sites are under a mine plan with prescribe rehabilitation it is expected that there will not be a cumulative impact on the soil properties. Topsoil for this application will be introduced and seeded as each bench and platform is completed, thus the physical properties of the soil will not have time to deteriorate. Once the site is rehabilitated the cumulative impact will only be applicable to the surrounding mine areas, if they are not rehabilitated. Thus the cumulative impact on the soil properties is rated low, considering the small area to be developed and rehabilitated.

Impact on soil properties

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Site Specific	1	Site Specific	1	Site Specific	1
Duration	Short Term	1	Medium Term	2	Short Term	1	Short Term	1
Intensity	Low	2	Medium-High	5	Medium	4	Very Low	1
Probability	Probable	2	Definite	4	Likely	3	Probable	2
Cumulative Impact	Very Low		Low		Low		None	
Status	Negative		Negative		Negative		Negative	
Confidence	High		High		High		High	
Significance	Very Low	8	Moderate	32	Low	18	Insignificant	6

Soils susceptible to water erosion are normally silty, are weakly structured, have low organic contents and have poor internal drainage. Soils on site are clayey and loamy, are well structured and have high organic content and internal drainage is low-moderate. This result in the soil not to be susceptible to erosion and is supported by the low K values.

The site is fairly stable in terms of soil erosion, thus the stripping of vegetation and topsoil during the construction phase on the first section of the mine and the cut-off trench, will not increase the impact. In addition, 1) the placing of wearing course on the access roads and constructing the cross drains to prevent erosion on the roads will be a positive impact, and 2) the construction of the diversion trench ahead of the top production face will divert runoff from the site away from the mine area, which will also mitigate the impact on the risk of erosion during the operational phase. Erosion will only increase in risk during the construction phase if the diversion trench and cross drains on the access road are not constructed in accordance to the prescribed method. The impact is rated very low.

The subsoil in the quarry area constitutes of weathered dolerite and solid rock. Weathered dolerite is gravelly, have lower organic content (as previously indicated) and higher leaching capacity. This will render the subsoil not to be highly erodible. The solid dolerite C-horizon, is also very stable and not susceptible to erosion when exposed. Thus, once mining commences erosion is not regarded as an environmental risk. However if all the available weathered dolerite is removed, water penetration would be limited and sub-surface flow on the contact zone will increase which will result in sheet wash and gully erosion down to bedrock, due to the nature of the C-horizon. In order to mitigate this, weathered dolerite will not be removed until the hard solid dolerite is reached, but at least a layer of 40-50cm will remain intact, prior to the replacing of the topsoil.

The platform areas that will be establish and will be fairly flat with a gentle 1:20 gradient towards the south-west and erosion is not expected. The steeper slopes will increase the erosion potential simply because run-off will increase and because of less absorption capacity. Such a scenario will eventually preclude the establishment of vegetation on the slopes. It is therefore very important to re-establish the vegetation on the slope areas as soon as possible. The impact on soil erosion is rated low-moderate.

The worst-case scenario would be erosion gullies of approximately 40cm deep depending on the amount of weathered dolerite on the slopes and material eroded will be diverted into the drainage channels and will be lost. If left unattended, these gullies will be increasing in extent and eventually bare rock will be exposed and total loss of vegetation will be prevalent. Thus, if needed,

once the topsoil is reintroduced on the slope areas, it be ripped and runoff diverted with contours to stable soils on the slope areas. During the mining operation these contours must spill in silt traps, provided with a proper spillway to prevent siltation of the immediate surrounds. Due to the length of the affected area erosion within contours must be prevented with in-channel dissipation measures.

In addition all available organic matter such as mulch on the slope areas can be used to reduce the battering impact of rain and to improve absorption capacity and re-vegetation rate. It is also very important to construct the cut-off berm ahead of the final production faces and splitting the slope by constructing benches. This will reduce slope height, slope angle and reduce runoff speed and subsequently erosion potential. The horizontal platforms will also act as energy breakers and reduce runoff velocity down bench faces.

Considering the above, it is pertinent that soil stability be achieved as soon as possible after mining has been terminated. Effective profiling and benching of slopes will reduce slope angle and also effectively reduce erosion potential. In order to re-establish a soil profile it is essential that at least 40-50cm of weathered dolerite remain on profiled slopes, prior to top dressing it with topsoil. To reduce runoff, reinstated soil must be vegetated as soon as possible to restore soil properties.

If erosion occurs on the slopes, it could be curbed by the infill material used during the construction of the cut-off drain or material mined. If erosion is experience below the exit of the drains, a series of small gabions can be positioned in this area, approximately 10m apart and must spill into a well vegetated area. Once the site is vegetated, it should be stable and little to no erosion is anticipated.

The existing haul road leading to the mine area will be used. This road is situated on a steep slope, which will foster increase run-off and increase erosion potential. Thus prior to mining the access road will be upgraded and protected with a proper wearing course that can be gained from the mining site. This is a positive result. The necessary cross drains must also be constructed before mining commence. Spills of the cross drains must be establish in areas that are well vegetated to insure that no further erosion takes place.

On the surrounding areas erosion was not noted, even on the exposed mine area. This is due to the fairly stable soil structures. Thus the cumulative impact at the site is rated low. Since the area will be protected with a storm water drainage plan, and the area will be rehabilitated lessens the cumulative impact to be rated low.

Impact on soil stability.

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Local	2	Local	2	Local	2	Site Specific	1
Duration	Short Term	1	Long Term	3	Short Term	2	Short Term	1
Intensity	Low	2	High	6	Medium	4	Low	2
Probability	Probable	2	Likely	3	Likely	3	Unlikely	1
Cumulative Impact	Very Low		Low		Low		None	
Status	Slightly Positive		Negative		Negative		Negative	
Confidence	High		High		High		High	
Significance	Very Low	10	Moderate	33	Low-Moderate	24	Insignificant	4

SOIL POLLUTION

Soil pollution can only occur should hydrocarbon spills occur or when 1) used oils and lubricants are purposefully drained into the soil, 2) storage facilities are destabilized or 3) if ablution facilities contaminate soils. At the site, these impacts, although low, are anticipated since trucks and earthmoving equipment could be serviced in emergency situations. However, no sewage system will be installed and no storage of hydraulic fluids will take place on site and no other chemicals or hazardous substances will be used at the site. No construction activities will lead to soil pollution and the impact is rated insignificant.

The low absorption and penetration capabilities of the subsoil could cause pollution plumes to migrate laterally to reach the drainage lines, but will only be applicable to very large spills, which is impossible considering the nature of the operation. Also, the limited vertical extent of the plume and the nature of the substrate will preclude it from reaching groundwater.

HYDROCARBONS

Trucks and excavators will require some quantities of diesel fuel, oils and hydraulic fluids and in return it produces used oils and lubricants. It is essential that these substances are handled correctly and that workers are properly trained in this regard; otherwise they could inadvertently cause unwanted environmental impacts, such as draining used oils into the soil. If needing to drain

hydrocarbons on site, it must be drained into drip pans and immediately siphoned into appropriate containers and disposed of on the same day. Only emergency repairs will be done over drip trays within the mining area hence no impact on soil is anticipated.

All of the machinery, trucks and earthmoving equipment will be well maintained and servicing of vehicles, fuel storage or establishment of a sewage system will not take place at the proposed quarry area. No other chemicals or hazardous substances will be used or stored at the site. No bulk diesel fuel, oils and lubricants will be stored at the quarry.

In the event of small spills, the natural bio-degradation of hydrocarbons could be slightly slower than in well aerated soils, but the use of fertilizers or oil surfactants could assist in breaking down limited spills in a short space of time. The impact is rated low under worst-case scenario and insignificant under controlled conditions, due to the limited spills anticipated in the process area.

SEWAGE

A chemical toilet will be provided within the excavation and situated to the north-east of the site on the first platform. Due to the small number of people (2-3) that will be onsite, limited soil pollution will therefore take place and a similar impact on the coli forms count in the soil and water is anticipated. The system must be maintained according to specifications stipulated by Municipal by-laws or by a local health inspector. Due to the absence of ablution facilities no effluent will be generated that could affect soils and groundwater sources inside or outside the study area. The anticipated soil pollution risk is rated low under worst-case scenario conditions and insignificant under controlled conditions.

WASTE

Domestic waste will be produced at the quarry but the waste streams (tins, paper, food) will be rather limited (0,5-1m³ per month) and will be removed to the nearest approved waste facility at East London. Even in limited amounts, uncontrolled storage of waste could lead to littering of the surrounds through wind action, which could affect livestock and fauna. Therefore, provision for waste receptacles with scavenger proof lids must be made. Handling of waste will be included in an environmental awareness programme to be developed for workers but it should be noted that this is not a requirement for mining permit applications.

During the operational phase the waste production will be low in the quarry area and the impacts on soils in this area are rated very low.

Most mining activities on the previously mined area have ceased and the neighboring site is in the final phases that should be rehabilitated in the near future. Thus the only area that would be subjected to possible soil pollution will be the new area, and considering that it is a small area, with impacts that will be mitigated in terms of waste management, the cumulative impact regarding waste is rated very low.

Impact of pollution on soils.

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Local	2	Site Specific	1	Site Specific	1
Duration	Short Term	1	Short Term	1	Short Term	1	Short Term	1
Intensity	Very Low	1	Medium	4	Low	2	Very Low	1
Probability	Probable	2	Likely	3	Probable	2	Unlikely	1
Cumulative Impact	Very Low		Very Low		Very Low		None	
Status	Negative		Negative		Negative		Negative	
Confidence	High		High		High		High	
Significance	Insignificant	6	Low	21	Very Low	8	Insignificant	3

LAND USE AND LAND CAPABILITY

The potential end land use of an area disturbed by development is determined most of the time by the capability of the land prior to development, which in turn is defined by the soil types in that particular area.

The activities during the construction phase will be limited to the removal of vegetation and stripping of topsoil on the first section to be mined, the cut-off trench and access road, which is a very small area. Thus the impact during the construction phase in terms of the land use is rated very low.

In terms of the Chamber of Mines rehabilitation Guide the site falls in an area that can be classified as wilderness land. The valley thicket found in the drainage lines south of the site is conserved in large reserves along the coast, and vast pieces of inland host this particular

vegetation type. It is anticipated that the percentage loss of this particular land type is less than 0,001%.

The original land capability was to sustain coastal forest vegetation, together with the fauna associated with this specific habitat. However, at the site the vegetation was cleared to establish a grass land, which is a very common phenomenon in the surrounding area and clearly visible across the valley with the small farms. The site mainly host grass land and thorn trees with secondary growth of valley thicket vegetation. This indicates that although the site was previously disturbed, sufficient time as has past for natural succession to commence. The site however is still a long way from representing the original vegetation species found in the undisturbed drainage lines. Thus from an ecological point of view, the land capability has been impacted on at the mining site. Only a few wild animals might still be found in this area, but most likely migrated areas that are not disturbed.



Figure 29: Small farms across the valley that has cleared hectares of vegetation to establish grass land and small crop farming



Figure 30: Undisturbed coastal forest vegetation in the drainage line vs the disturbed area on the mine site hosting mainly grass species and thorn trees.

In terms of the STEP programme the conservation status of the land concerned is rated 'Currently not vulnerable' and would be able to withstand impacts related to any additional loss of surface cover or structural development. Since this is not a conservation area, the need to maintain biodiversity is not a prerequisite.

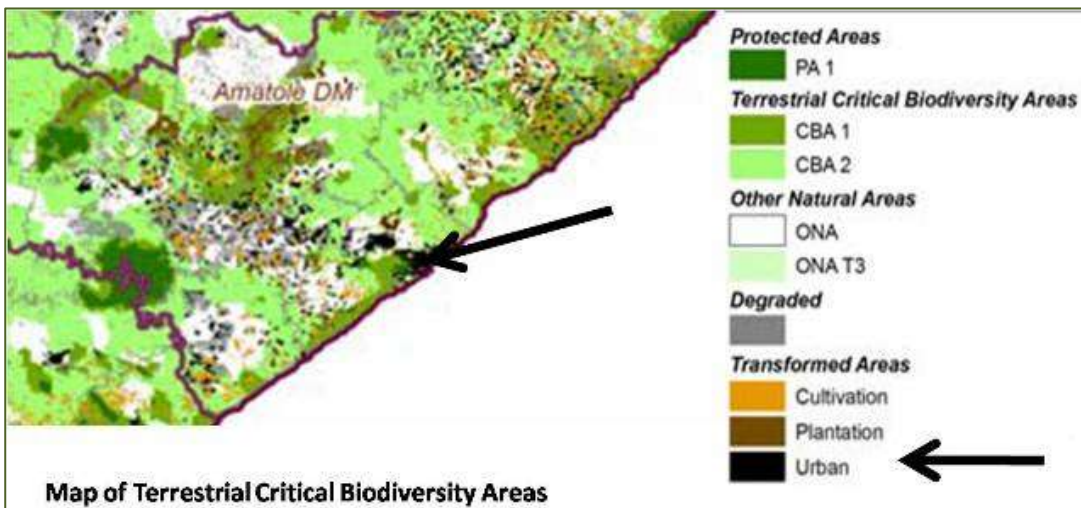


Figure 31: Map indicating that the mine area fall within Transformed Areas

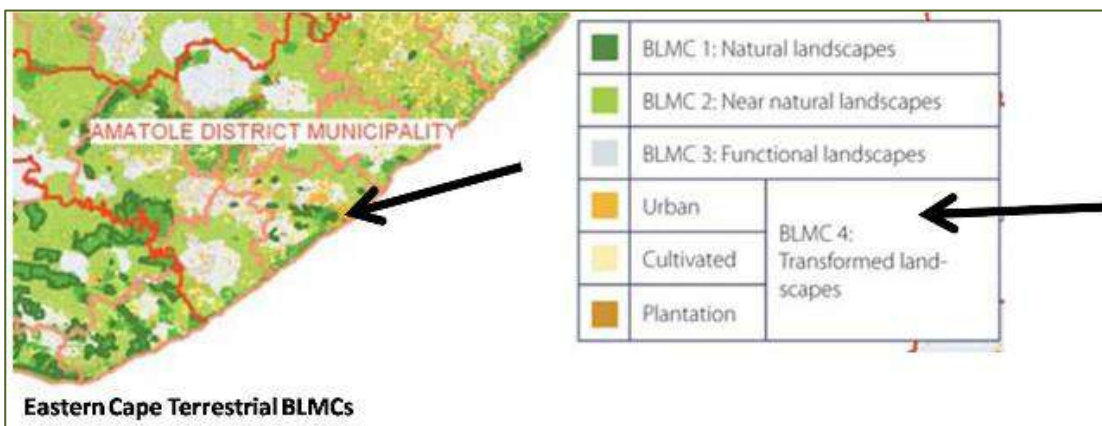


Figure 32: Map indicating that the mine area falls within Biodiversity Land Management Classes 4; thus within Transformed landscapes.

Some land use types have a much greater negative impact on biodiversity than others. For instance, timber plantations and urban settlement are much more damaging and permanent to biodiversity than livestock and low-impact tourism activities. BLMC 1 refers to areas which are critical for biodiversity persistence and ecosystem functioning, and which should be kept in as natural a condition as possible. Thus BLMC 4, in which the mining area falls, refers to areas which are not critical for biodiversity persistence and ecosystem functioning and would not be possible to keep in as natural state as possible.

Table 1: Recommended Permissible Land Uses for Terrestrial BLMCs

Land Use	Biodiversity Land Management Class			
	BLMC 1	BLMC 2	BLMC 3	BLMC 4
Conservation	Yes	Yes	Yes	Yes
Game Farming	No	Yes	Yes	Yes
Communal Livestock	No	Yes	Yes	Yes
Commercial Livestock Ranching	No	No	Yes	Yes
Dry Land Cropping	No	No	Conditional	Yes
Irrigated Cropping	No	No	Conditional	Yes
Dairy Farming	No	No	Conditional	Yes
Timber	No	No	Conditional	Yes
Settlement	No	No	Conditional	Yes

Abbreviations: No = not recommended; Yes = recommended; Conditional = Approval conditional on environmental authorisation.

Table 1 also calls attention to land use changes that require environmental authorization (e.g. an EIA). These are listed as “conditional”. Mining is not considered change in land use and to date no application needs to be made at the Department of Environmental Affairs for approval, however the local Municipality might require an application for the temporary change in land use.

As previously indicated the land at the mining site is zoned agricultural, but is categorized as a Built-up area according to EPAEC (Environmental Potential Atlas for Eastern Cape). The nature of the organic rich soil would provide excellent soil to establish a grazing unit, which is most likely the reason why the previous land owner established a grazing unit, because the coastal forest is mostly impenetrable and not suited for domestic animals. It is not known why this area is no longer grazed and why it has been left dormant, but since this site is representing a dormant grazing unit, it is recommended that a grass unit would be established post mining.

In addition, the study area reflects a potential development node due to the close urban development areas further south-west of the site, and the site might very well be encroached on in the future, thus mining will assist in establishing a better site profile to establishing future development.

It must be noted that this mining site falls within a larger area that has been severely disturbed due to a few other land uses: To the south-east and north-west, there are other mining areas; there are industrial and residential areas to the south-west and south; to the north, across the valley are small farms that has cleared plenty of natural vegetation for farm land; original vegetation is mainly found in the drainage lines where development is not favorable. This mining venture will not impact on any of these land uses, since it will be restricted to the approved mine area. From a hunting perspective, there are adequate other areas that can be utilized for this purpose and the impact would be insignificant.

Mining always affects biological activity in the soils and thus also the nutrient cycle, which could result in a slower re-vegetation process. Considering the short period for which the topsoil will be stored, most of biological processes within the soil will be maintained. Upgrading of the soil will further assist in retaining all biological processes in the soil. Decreasing depth of the B-horizon could result in higher water potentials, due to a decrease in the depth of the natural sponge capacity of the soil. This in turn, could cause temporary ponding of water and a higher erosion risk at the site. The former will stimulate vegetation growth and the latter must be controlled carefully. Increased flow volumes at the site could facilitate increased sediment transport and result in the loss of topsoil on the slopes. The need for control measures is therefore important.

The limited loss of grazing potential for the few wild animals is negligible. The potential offset of the loss of this section of wilderness land against the revenue generated with Sabunga (weathered dolerite) sales, definitely favors the mining option.

Considering the small area to be mined relative to the surrounding land, the impacts mentioned could be rated as very low and temporary if the required mitigating measures are put in place. Once quarry development has been concluded, the quarry floor will be able to function, as a grazing unit and capable to host agricultural development.

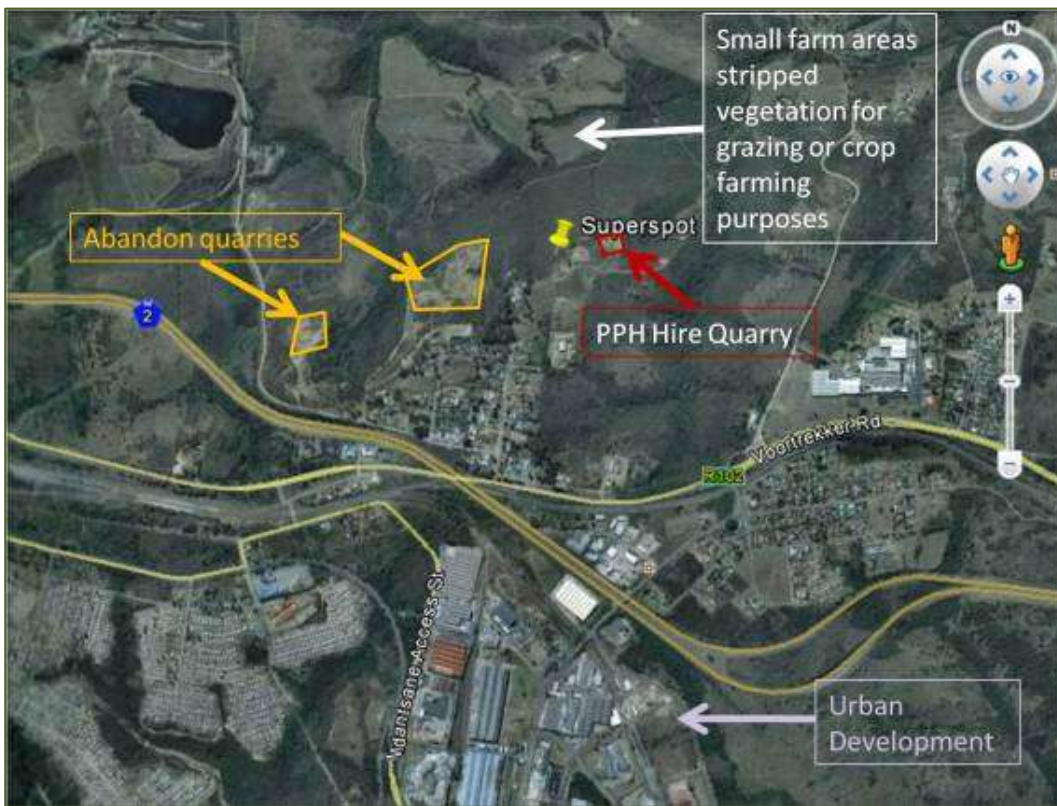


Figure 33: Surrounding land use of the proposed mining site

In the unlikely event that the site is not rehabilitated the cumulative impact on land use will remain the same as prior to mining, because currently the land use at the site is dormant. However, the site will be rehabilitated, which will improve the site profile and grazing unit, thus mining will have a low positive impact on the cumulative impact on land use in the area, due to the small section to be restored.

Impact on land capability and land use

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Site Specific	1	Site Specific	1	Site Specific	1
Duration	Short Term	1	Medium Term	2	Short Term	1	Medium Term	2
Intensity	Low	2	Low - Medium	3	Low	2	Low	2
Probability	Probable	2	Likely	3	Likely	3	Likely	3
Cumulative Impact	None		Very Low negative		Very Low negative		Low positive	
Status	Negative		Negative		Negative		Positive	
Confidence	High		High		High		High	
Significance	Very Low	8	Low	18	Very Low	12	Very Low	15

FLORA

As previously indicated, the mine area falls within the Transitional Coastal Forest area and this vegetation type is quite resistant to external impacts but once disturbed it does not recover over the short or medium term, as can be seen at the site. Previous clearing of vegetation has impacted on the vegetation type as very little of the original vegetation species are present. There is less than 20% of the original vegetation represented at the site, thus no formal vegetation survey was completed. From the original species left, the following were noted on site during the field investigation: *Rhus crenata*, *Brachyleana elliptica* and *Olea europea*. None of these species are considered endangered, vulnerable or red data.

In the drainage line next to the site, most of the original vegetation species still occur, but will not be impacted on, since it falls outside of the mine area.



Figure 34: Thick, impenetrable coastal forest vegetation in the drainage line

Plenty of juvenile thorn trees were noted, but little alien vegetation. However in other mining areas where the sites were not rehabilitated alien species has invaded the site of which the most common invaders are the black wattle (*Acacia mearnsii*) and the Blue Gum (*Eucalyptus globules*), castor oil plants (*Ricinus communis*), cestrum (*Cestrum laevigatum*), lantana (*Lantana rugosa*), *Pinus* specie, *Solanum* specie, *Cassia didymobotria*, and *Syringa* specie. Therefore every disturbance in this area has a high risk of alien infestation if care is not taken. In terms of the conservation status at the site, none of the indigenous vegetation is conserved.

In terms of the impact on the flora during the construction phase, only the section that will become the first bench and platform area's vegetation will be stripped to make way for the development, as well as the cut-off trench ahead of the mine area and the access road. The construction of the access road will not be wider than 4m thus only a small strip of vegetation will be cleared. The impact during construction on the flora is therefore rated very low, considering the very small areas to be cleared and the very low conservation value of the flora.





Figure 35: Vegetation found on site

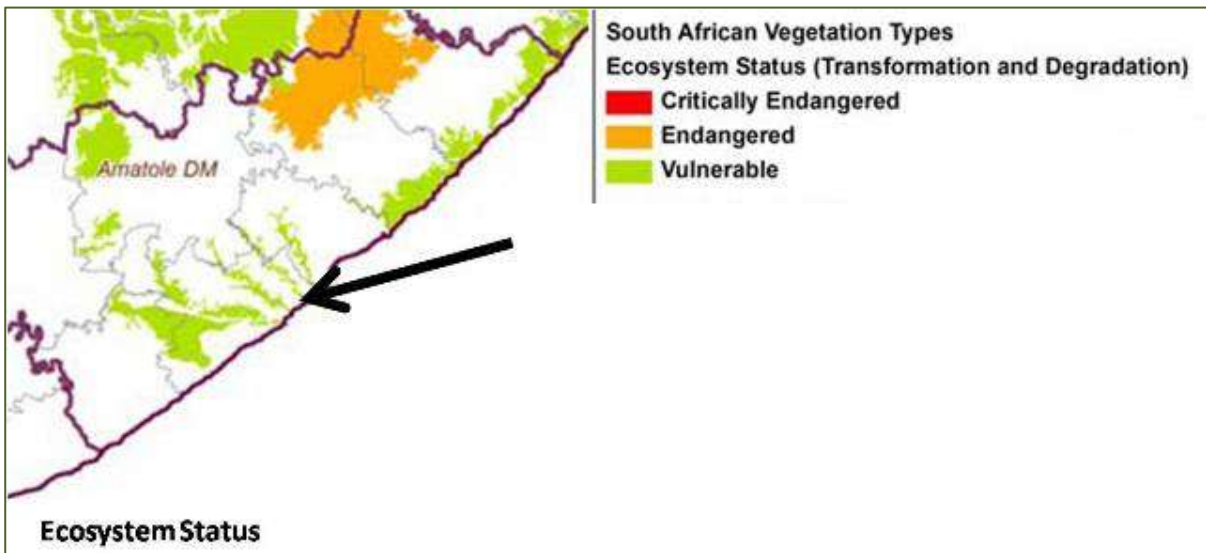


Figure 36: The mining site does not fall within any Critically Endangered, Endangered or Vulnerable Vegetation Ecosystems.

According to land classification the invasion potential of the land concerned is rated medium and disturbed land should be treated with care.

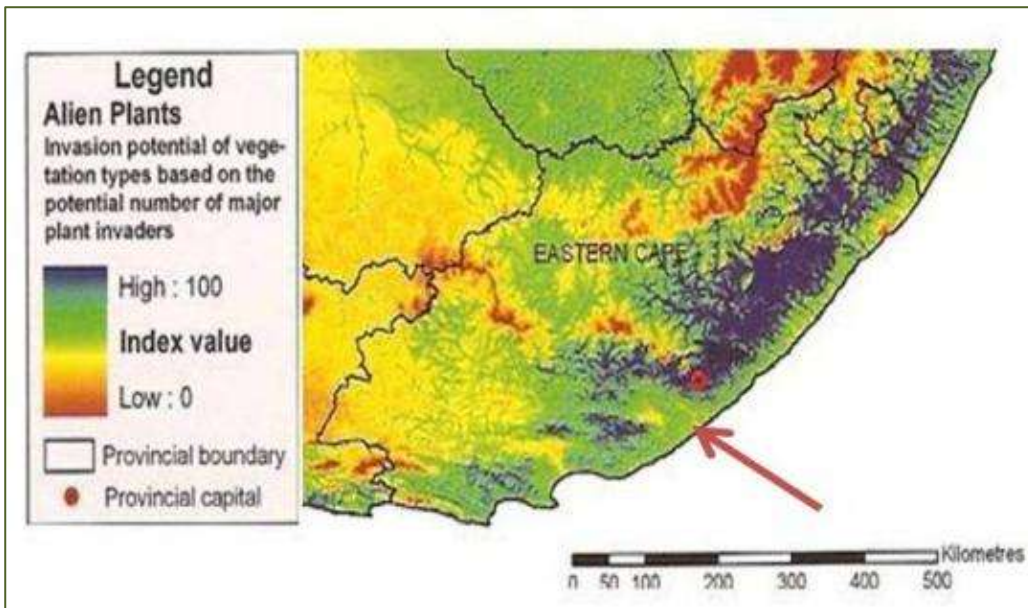


Figure 37: Potential Alien Plants Invasion Index

Thus, once re-vegetation of disturbed areas starts the impact of alien vegetation re-colonizing the site could emerge as a significant impact. Should an alien control program not be put in place, the objective of re-establishing the site with a proper grass cover will not be reached and the proposed mining venture could be rated as unsustainable. This scenario must be prevented at all cost.

Seeding plants should be hand-pulled. Immature plants should either be ring-barked, dug out, or the stems should be cut as near as possible to the ground. The bark on the remaining stem stub must be peeled off into the ground, once the stem has been cut. Mechanical eradication is an effective method of control as long as the stems of older plants are severed as low as possible, thereby ensuring that no buds will re-sprout.

Thus during the operation phase and at closure this unit will not be restore to Transitional Coastal Forest, since the site has already been impacted on previously, removing the indigenous vegetation. Also, the mine is abutted by heavily impacted areas already, with plenty of alien vegetation that could act as a seed bank for infestation of newly rehabilitated areas and only with a vigorous re-vegetation programme, can alien vegetation infestation be controlled.

The success rate of re-vegetation will also depend on concurrent rehabilitation, the stabilization of soils by means of an acceptable secondary grass cover and if post closure eradication programme are followed. Mining will therefore clear the vegetation and once mined out; the site can be re-established with *Eragrostis curvula*, *Themeda trianda*, *Sporobolus africanus* *Digitaria eriantha*, and *Panicum maximum*. None of these grasses poses any threat of proliferation and is best suited to cover the area in a fairly short period of time. On the slope areas, where the incline would be much steeper and the potential of erosion would be higher, indigenous creepers could be established to help mitigate erosion together with the mentioned grass species.

The *Clematis brachiata*, also commonly known as the Old Man's Beard, is a deciduous climber that can reach up to 5m and can be planted on the slopes. The flowers are formed by long feathery tails that attach to each seed, which assists in wind dispersal, which is frequently experienced in this region. It is a fast, easy and adaptable plant and wide spread in South African and the Eastern Cape. It can be left to trail to cover embankments or to form a light groundcover, which will assist in stabilizing the soils on the slopes, providing opportunity for grass species to colonize the mine slopes. *Clematis brachiata* is hardy and adaptable, not fussy about soil type or pH. It prefers summer rain and dry winters, with a position in full sun or semi-shade. Seeds may be sown in spring or cuttings of semi hard wood of the plant may be taken and planted throughout summer.

Another creeper that can be planted that is indigenous is the *Jasminum multipartite* commonly known as the 'starry wild jasmine'. This is a larger, scrambling, and mostly evergreen plant, compared to the *Clematis*. It is best grown as a shrub that can reach up to 1.5m-3m high and is medium to fast growing. Insects such as the larvae of the Cambridge Vagrant Butterfly, the Variable Prince Moth, Oleander Hawk Moth, Death's Head Hawk Moth, and King Monkey Moth feed on *Jasminum* species while the Hawk moths pollinate the flowers. Thus the flowers attract insects to the garden, and therefore insectivorous birds follow. This plant is also browsed by game. *Jasminum multipartite* can tolerate full sun; however it prefers a partially shaded position where the soil is well-drained. Thus this plant can be planted in areas at the mining site, where topsoil will be spread over weathered dolerite or over discarded boulders in shady areas. In addition, this plant succeeds in a variety of soils, but likes plenty of well-rooted organic material, like the topsoil available at the site. Excessive water can sometimes cause the plants to die off, which will not be a problem on the slopes. It is easy to propagate the *Jasminum* from semi-hardwood cuttings made in spring and summer when plants are actively growing. Propagation by layering runners/suckers from the plant is also successful, as is sowing seed.

Considering the very low conservation value of the vegetation to be removed during the mining process and the limited area to be affected, the impact is rated of very low significance with mitigation.

In the unlikely event that the mine area is not rehabilitated, the cumulative impact will remain low, considering the very low conservation value of the areas surrounding the mining site, including the mine area. Once this site is rehabilitated and an alien control program is followed the cumulative impact will decrease.

Impact on the flora

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Site Specific	1	Site Specific	1	Site Specific	1
Duration	Short Term	1	Medium Term	2	Short Term	1	Medium Term	2
Intensity	Low	2	Low-Medium	3	Low	2	Very Low	1
Probability	Probable	2	Likely	3	Likely	3	Probable	2
Cumulative Impact	Very Low		Low		Very Low		Very Low Positive	
Status	Negative		Negative		Negative		Positive	
Confidence	High		High		High		High	
Significance	Very Low	8	Low	18	Very Low	12	Very Low	8

FAUNA

The small patches of areas that are not disturbed, like the drainage line and areas further north from the mine site beyond the farms, host typical coastal forest vegetation. The thicket habitat poses a definite ecological niche for animal species since the canopy provides adequate forage, nesting place and protection for avian fauna whilst the under storage provide adequate protection and forage for browsers. However, as previously indicated the mine area has been disturbed in the past and the site provides 20% of the original vegetation and mostly grasses and thorn trees, which might provide feed for some wild animals, but secondary grassland does not provide habitat for wild animals, except for some small rodents, reptiles, insects, etc. Due to these limited resources that this area offers, original species diversity at the site is low. In addition, the surrounding areas to the south-east, south, north-west, and north have also been severely transformed due to mining, urban development and farming resulting in wild animals becoming increasingly scarce. The close proximity of urban development and residents would cause most wild animals in this area to move towards areas which are more protected.

This area is however rich in bird species and a few were noted during the site visit. Birds of importance that could be in the area and that are of conservation value are the African fish eagle, black eagle and goliath heron. It is unfortunately not known whether any species of concern are dependent on the site for breeding but the close proximity to residential areas and surrounding mining might have already forced them out of the area towards the more undisturbed areas.

During the site visit no large or medium size mammals was noted, but this is not to say that they do not occur or visit the area from time to time. Most of the rare animal's habitats are associated with riverine environs, which mostly preclude their existence in the study site, since the site is situated on a hill. However a drainage line falls outside the mine area which is situated to the south of the site, which could provide habitat for these animals. Since there are very few remaining wild mammals on site, no detailed faunal survey was conducted. The more important animals that could be hosted by the proposed mine area are bushbuck (*Tragelaphus scriptus*). In fact, Bushbucks are spotted on some occasions in the area. They are in particular mainly browsers, but on rare occasions will consume grass. They are selective feeders, but during hardship are able to adapt their feeding habits for the sake of survival. Thus it is not uncommon to notice bushbuck in this area, where most of the original coastal forest has been replaced with grass lands. Bushbuck has obviously adapted to the surroundings and still has access to the smaller patches of coastal forest that has not been disturbed and falls outside of the mine area. Usually bushbucks are more active during the early morning and part of the night, but also fairly active during the day. Bushbuck's preferred habitat is however dense bush along river courses, since this antelope is always found close to permanent water courses.

Other important animals that might occur in this area are the antbear (*Orycteropus afer afer* - rare), blue dyker (*Philantomba monticola* - rare), common duiker (*Sylvicapra grimmia*) and grysbok (*Raphicerus melanotis*). In terms of the Amatola Management Plan two rare species, *Macrelaps microlepidotu* and *Acontias plumbeus* may occur in this area. Other smaller reptiles and rodents such as rats, mice, lizards, and snakes (puff adder, night adder, boomslang, skaaap steeker and mole snake) as well as small mammals such as hare and wildcat might also be present in the area. It is anticipated that amphibians could most probably be localized in the drainage line next to the site. Effluent from the mine will be limited due to the low clay and silt percentage and limited sediment will be transported into the drainage lines due to energy dissipaters in the drainage trenches and the storm water control plan. Due to the moderate distance to open water small hydrocarbon spills or leaks that may occur will not readily impact on any aquatic species that may occur within ephemeral watercourses and drainage lines below the quarry. The limited silt will simply be absorbed by the drainage vegetation.

Construction activities pertaining the clearing of vegetation for the cut-off trench as well as prior to developing the first bench and platform and the access road and would be restricted to limited areas and the slow extraction rate would provide adequate time for slow migration from the

affected area and be sustained in the adjoining habitats that are not disturbed. The impact is rated as very low during the construction phase, due to the very low number of animal species that will be affected.

Only 1.5 Ha will be mined, migration patterns of animals within the will not be detrimentally affected. The extent of the impacts mentioned would; however rely on a dedicated rehabilitation approach from both the applicant and the DMR.

Removal of vegetation and topsoil will result in the destruction of habitat but since the habitat has already been impacted on, it will not cause any additional impact. Mining would be restricted to a limited area and the slow extraction rate would provide adequate time for slow migration from the affected area and be sustained in the similar adjoining habitats. The patches of Coastal forest left will remain to provide habitat for these animal species and mining will not impact on these habitats. It must also be noted that human activities such as industrial sites, residential development and farming was establish in prime coastal forest compromising a very large section of habitat reserved for these indigenous animals. The fact that some wildlife is still spotted in the area is an indication of the animals adapting to the collective impact of human activities. Since this is also a dormant land, this area will be used to provide limited grazing post mining, thus this small area to be mined will not result in establishing an ecological niche for wild animals to re-colonize it.

The noises generated on the site will be from a limited number of people communicating with each other and from the excavator and trucks but would not be excessive and noise levels are anticipated to range between 55 and 70 decibels at the mine boundaries. Most of the noises would be low-pitched and would have a lesser impact on animals than what high-pitched noises would have. Hearing systems of animals are much more sensitive to the latter. Should animals found themselves on site the slow development process would also provide ample time for all species to migrate to abutting areas.

Indiscriminate hunting/trapping/poaching could be a potential problem and the necessary discipline and monitoring has to be enforced. The applicant will take responsibility for any animal (wild or domestic) that is proved to be killed by members of quarry staff. Strict control measures will be put in place and severe penalties will be applicable if any animal on site is poached.

Limited hydrocarbon spillages anticipated would not detrimentally affect fauna on site as it would be localized and dealt with in an expedited manner. Hydrocarbons and the servicing of vehicles will not take place on site hence no impact is anticipated in this regard.

In conclusion, removal of the vegetation in the study area will not result in the extinction of any specie or decrease in species numbers. Since the site is small and will be rehabilitated no permanent or significant impact will be imposed on species diversity, forage patters or migration. The impact on the fauna at the site is rated as very low, provided that proper grassland is established.

The cumulative impact on fauna is rated insignificant, since this site does not host any significant fauna species due to the vegetation cover. Once the areas are rehabilitated, the site will be utilized for grazing.

Impact on fauna.

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Local	2	Site Specific	1	Site Specific	1
Duration	Short Term	1	Short Term	1	Short Term	1	Medium Term	2
Intensity	Low	2	Medium	4	Low	2	Low	2
Probability	Probable	2	Likely	3	Probable	2	Unlikely	1
Cumulative Impact	None		Very Low		Very Low		None	
Status	Negative		Negative		Negative		Neutral	
Confidence	High		High		High		High	
Significance	Very Low	8	Low	21	Very Low	8	Insignificant	5

SURFACE WATER

There is no natural surface water in the area, accept for a small dam to the far north-east of the mining site, which is used by that property owner. The study area is mainly drained by a subordinate ephemeral drainage line to the south-south-west, but also with a small drainage line north-west. After heavy rains these drainage lines carry some water, but drains away from the mining site into a small stream north of the site and is well vegetated.

During the construction phase, the cut-off trench will be constructed ahead of the mine area, vegetation will be cleared on the first section of the mine to establish the first platform and bench, and the access road will be constructed. Thus during this period some silt might be transported

into the drainage lines, however it will be a very limited amount due to the very small areas to be cleared. Thus the impact during the construction phase is rated very low.

Mining will not alter drainage patterns. During the operational phase, the water quality can be affected through an increase in suspended and dissolved solids, since surface water at the quarry will be drained away from the production faces and diverted into the drainage line. However, this impact will be mitigated through the proposed storm water control measures, as described under the heading "Soil". A cut-off trench will be provided ahead of the development to prevent runoff from the on slope to spill into the mining area. Also, the platform areas that will be establish will be fairly flat 1:20 gradient towards the south-west, where run-off from the platforms and the slopes will be diverted through the run-off trenches to the drainage lines to the south-east and north-west of the site.

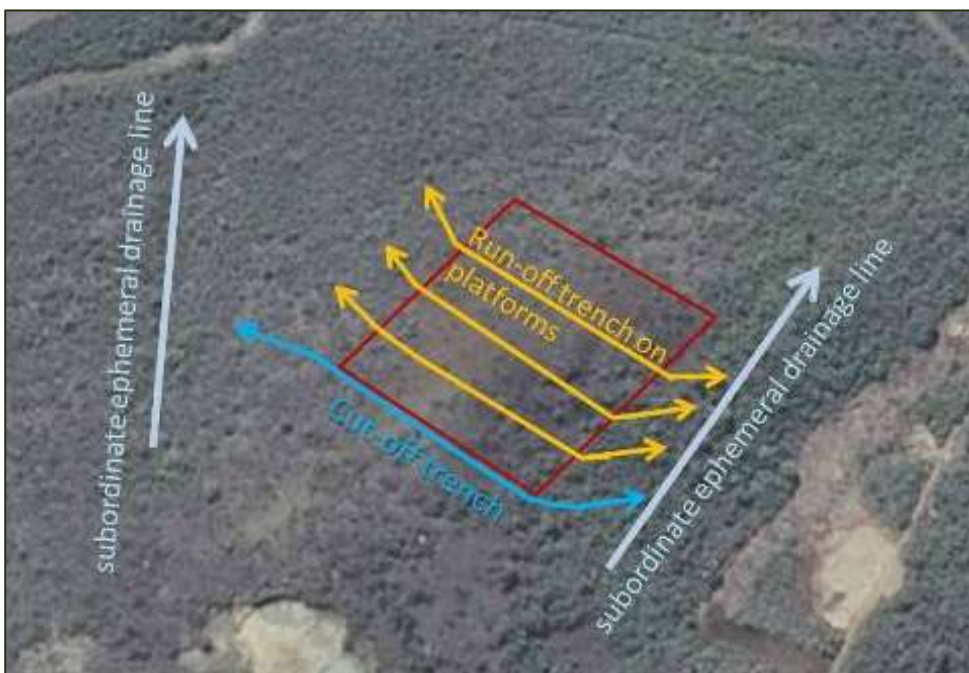


Figure 38: Storm water control measures

Additional contours may be constructed on the slope areas where erosion is expected due to the placement of topsoil on steeper inclines. The runoff will be diverted to stable soils to the south-eastern and north-western sides of the quarry. The contours must spill in silt traps, provided with a proper spillway to prevent siltation of the immediate surrounds. Due to the length and slope of the diversion trenches, the increase runoff velocity must be prevented with in-channel dissipation measures every 20m. The contours will also act as energy breakers and reduce runoff velocity down the bench slopes.

It is also very necessary to rehabilitate the destabilized soils and that rehabilitation is being progressively executed to prevent increased silt loads being deposited within the drainage environments below the quarry during high precipitation rates, since the site will be free draining. This is applicable to large sediment loading that potentially can cause drainage lines to be smothered resulting in dieback of fauna and flora, however very little silt transport into the drainage system are anticipated due to the storm water control structures in place and the fact that only a small sections at a time will be mined. Even in worse cast scenario when the whole mine is cleared; it only compromises of a 1.5Ha area, which is still small. The small amount of silt transport that is expected from the quarry area into the drainage lines will simply be absorbed by the plants and no impact is expected.

SEWAGE FACILITIES

Potentially, the toilet facilities could cause coliform contamination of surface runoff but since the system (chemical toilet) is a closed system, will cause this impact to be of low significance.

HYDROCARBONS

Fuel will not be stored on site and only emergency servicing of vehicles would be performed therefore hydrocarbon spills should the very limited, in addition, the use of appropriate receptacles such as drip pans will cause this impact to be negligible. The nature of the soil in the excavation will prevent that it reach any drainage line outside the mine area. The impact is rated very low.

WASTE

Since no crusher and processing plant will be housed on site no contaminated or toxic wastewater will be generated; therefore no treatment facilities for this purpose are needed. Very limited amounts of household or industrial waste would be generated and therefore management facilities would be restricted to waste bins and skips in the process and office areas.

HAUL ROAD

The haul road could be a source of increased silt laden runoff due to the steepness of the slope and the wearing course that will be put in place. This will, however be easily controlled by cross and mitre drains directing runoff to the vegetated areas next to the road where silt will be filtered out.

WATER CONSUMPTION

Potable water will be brought to site and will be minimal. If it is required to irrigate vegetated areas during extreme dry periods, *ad hoc* consumption will not exceed 15m³ per day and will be obtained from the Municipality and trucked in. Water could be stored onsite in elevated JoJo PVC tanks. Since no water will be abstracted from a natural source the impact is rated insignificant.

Based on the mitigation measures provided for reducing the silt load of water emanating from the mine area, the impact of the quarry operation on natural surface water is rated of low significance.

There will be no cumulative impact on the surface water of this mining and the previous mining sites, since storm water will be controlled and monitored at this site and rehabilitation will take place.

Impact on surface water quality

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Local	2	Site Specific	1	Site Specific	1
Duration	Short Term	1	Medium Term	2	Short Term	1	Short Term	1
Intensity	Low	2	Low Medium	3	Low	2	Very Low	1
Probability	Likely	3	Likely	3	Probable	2	Unlikely	1
Cumulative Impact	Very Low		Low		Very Low		Very Low	
Status	Negative		Negative		Negative		Negative	
Confidence	High		High		High		High	
Significance	Very Low	12	Low	21	Very Low	8	Insignificant	3

GROUNDWATER

The main groundwater aquifer will not be impacted on by mining. At the site, the weathered dolerite is the target material that will be removed and normally, due to the high permeability of the weathered dolerite and the thickness thereof, perched aquifers develops through infiltration and downward percolation of water, especially at the contact zone with the mother material. This aquifer will not be affected since, although the retention capacity will be reduced during mining a layer of at least 40cm thick will remain intact and weathered material will not be removed until

the solid parent material is reached. Thus the subsurface flow will continue to function as per normal and would not be impacted on. In terms of quantity it will not be affected, except for that portion lost through evaporation. In addition, this aquifer is not commercially used, thus the impact is rated very low. There is no borehole in the mine area and future water abstraction is not contemplated.

Taking the extent of the operation into consideration, infiltration of sediment and hydrocarbons and solvents into the soil will not affect the primary aquifer due to the depth thereof, which will exceed 30m. Since there would be very limited waste volumes onsite and no hydrocarbon or chemical storage on the property, the impact is rated very low. Because of the limited extent of the mine, recharge of the aquifer will also not be affected and the impact can be rated as very low. The aforementioned reasons will also prevent any impact on groundwater quality or yield of boreholes, if any, in the larger area.

SEWAGE FACILITIES

Potentially the chemical toilet facility could cause e-coli contamination and increased levels of phosphate. Since there will only be one toilet onsite and will be regularly serviced, the impact on ground water quality is rated insignificant.

WATER CONSUMPTION

No groundwater will be used. Drinking water will be brought to site and bought from the local Municipality.

Impact on ground water quality & reserves

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Local	2	Site Specific	1	Site Specific	1
Duration	Short Term	1	Short Term	1	Short Term	1	Short Term	1
Intensity	Very Low	1	Medium	4	Low-Medium	3	Very Low	1
Probability	Probable	2	Likely	3	Probable	2	Unlikely	1
Cumulative Impact	None		Very Low		Very Low		None	
Status	Negative		Negative		Negative		Negative	
Confidence	High		High		High		High	
Significance	Insignificant	6	Low	21	Very-Low	10	Insignificant	3

The air quality of the immediate surroundings is fair due to its semi-rural status. During windy periods the abutting bare areas will liberate a limited amount of dust into the atmosphere causing a slight rise in air pollution levels. The same scenario applies when motorists are using the gravel roads. In addition, an increase in smoke generated by household fires could also decrease the prevalent air quality but it would be intermittent and limited. Since the property involved is still zoned agricultural and rural, it would cause tolerable ambient levels to be higher than those for residential areas. It would on the other hand not exempt the applicant to implement measures to keep disturbed areas as small as possible and to reduce dust generation when and wherever possible.

Construction activities that might impact on the air quality will be related to the clearing of vegetation on the first platform and bench and access road which might cause a small dust plume in the air, which will be fairly tolerable in the area considering that this is a semi-rural area. The impact during the construction phase is rated very low.

Earth moving activities during the operational phase, such as removing topsoil will generate low amounts of dust, which should not pose any discomfort or be harmful to nearby residents due to the relatively far distance involved that will filter out dust. Also the gravelly material *per se* is not a harmful substance and should not cause any discomfort to people when excavating weathered dolerite.

Dust generation as a potential impact, can be brought under control by implementing the correct re-vegetation and irrigation strategies at the topsoil stockpiles and would be of low significance and temporary. In order to prevent the impact at source minimum areas should be denuded and height of stockpiles must be kept to the minimum. When reintroduced to disturbed areas, topsoil should be irrigated and seeded as soon as possible or such events should coincide with wet periods.

Increased hauling activities on the roads and in the mine area will definitely increase dust liberation into the air and could as worst case scenario result in a cloud of dust hanging above the road and process area, depending on the demand of the road construction project. The closest residence is located 250m to the south-west of the mine boundary.

Dust counts along the road may increase by as much as 400mg/m²/day but will abate very quickly further away from the roads. In terms of DEDEA and SABS standards it should not exceed 600mg/m²/day. There are no residences located along the haul road that will be subjected to continuous dust generation, however truck drivers will be sensitized on the matter and vehicle speed should be reduced where possible. This impact will also only be temporary and will cease once mining is completed. This impact while in operation is rated of low significance. A maximum of 10-8 truckloads would be carted from the property per day resulting in vehicle movement approximately every hour or so and since dust generation is also determined by speed in conjunction with axle number it is imperative that the drivers reduce haul speed to approximately 30km/h. Without mitigation the impact would be low-moderate. With 10-8 trips per day about 4kg dust will be generated per day at a speed of 30km per hour. With any rain, dew or watering down, these value will drop drastically.

The natural product contains no silt or clay and no crushing will take place on site, thus additional dust generation will not be a consideration. During windy periods the proposed quarry will release only a limited amount of dust into the atmosphere. These particles will be heavy and will fall out within 100m. Also, the site is also protected from the prevailing western and eastern winds by the natural topography thus further mitigating the impact.

Thus it is anticipated that the dust count at the closets residence to the site (250m from the southwestern boundary) will not be increased with more than 10 mg/m² which will also fall outside the nuisance threshold. Other residences are located further from the site and dust should not be factor. Since no processing of material is envisaged and dolerite normally does not contain substantial dust generating material or silica no impact on human health is anticipated hence gravimetric dust sampling need not to be done. No dust plumes are anticipated that could have an impact on the aesthetics of the area.

Vehicular emissions will be related to one excavator, one frond-end loader and a number of trucks and it is anticipated that the impact would be low. People would not reside on the property; therefore smoke generated by cooking fires would not be a consideration. No waste would be burned on site. No other form of chemical air pollution is envisaged. No odours will be generated by the mining operation.

Small stockpiles will be established within the excavation, but will be removed within a weekly basis. Topsoil stockpiles may cause more dust liberation into the air but the small stockpiles and will preclude any major impact from occurring. In terms of existing standards topsoil removal will lead to approximately 5,7kg dust per day and should not significantly impact on air quality. Spreading of topsoil during the re-vegetation phase will result in the loose soil to become prone to

wind erosion. At closure, all aggregate will be removed and remaining topsoil spread on the last phase of the disturbed areas and will be vegetated with the result that dust generation on site would be almost eliminated.

The overall impact on air quality is rated as low with mitigation, considering the small-scale operation involved and the limited amount of people that might be affected. At closure, the disturbed area would be rehabilitated and would cause air quality to revert to original levels.

The cumulative impact on air is depended on the disturbed areas. As mining progress and clears the first phase the total disturbed area will become larger and potentially could increase the source of dust generation during periods of high winds. However mining will be conducted in phases and concurrent rehabilitation will take place, as soon as the entire site has been rehabilitated and once the DMR has enforced rehabilitation on the other mining sites, all the sites will be reestablished with vegetation and the source of dust will be eliminated. Even in the event that the abandon sites are not rehabilitated, the fairly small section of source point will still result in the cumulative impact to be rated as low. It must also be noted that farm lands across the valley regularly clear vegetation for agricultural purposes which could also affect the cumulative impact in the area but falls outside the scope of the applicant.

Impact on air quality

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Local	2	Local	2	Site Specific	1
Duration	Short Term	1	Short Term	1	Short Term	1	Short Term	1
Intensity	Low	2	Medium	4	Low-Medium	3	Very Low	1
Probability	Probable	2	Definite	4	Likely	3	Probable	2
Cumulative Impact	Very Low		Low-Moderate		Low		None	
Status	Negative		Negative		Negative		Negative	
Confidence	High		High		High		High	
Significance	Very Low	8	Low-Moderate	28	Low	18	Insignificant	6

The semi-rural nature of the area would probably cause the ambient noise levels to be low 45dB. However, traffic on the N2, R102 (Voortrekker Road) and activities within Eureka residential area will intermittently increase noise levels to approximately 55dB.

Construction activities that will generate noise will involve earth moving machinery to strip the topsoil layers to prepare the site for excavation. This action will continue into the operational phase, since the site will expand to the next phases. Since there are no neighbors situated very close to the site, this impact is rated very low.

Noises generated at the quarry will generally be low-pitched if operating equipment is well maintained. There is one exception and that is the reverse sirens which produce a high pitched, irritating noise and possible could cause some irritation to nearest residences early in the morning or later at night. Since the fitting of the sirens is a requirement of the Mine Health & Safety Act as well as OHS Act, there is no mitigation possible, except for preventing operations very early in the morning or late at night. The workday only start at around 07.30 and ends at 17.00 and which coincide with normal working hours during the week. Work over weekends will be restricted to between 08:00 and 13:00.

Mine operation will remain 250 m from the nearest residence and the impact would therefore remain low, especially since the topography and vegetation screen will absorb a substantial amount of noise. Noises will all be low-pitched and no crushing will be done. In order not to cause any unacceptable disturbances, noise levels should be kept below 50 decibels during the day within 100m from the site, which would be well within reach of the excavator and trucks used in the mining process provided that they are well maintained. Under adverse conditions such as low cloud cover or strong winds blowing towards recipients could increase noise levels between 2-3dB, but considering the low levels at hand, the impact is still rated low.

During extraction one or two trucks will enter or exit the mine at any given time within a 50-60minute time span, and the impact is rated low. Impacts related to the use of the bulldozer will be *ad hoc* as it will only be used during the clearing of vegetation onsite or when profiling the sides of the quarry.

Maintenance of equipment where steel on steel action is involved will be vaguely audible and should be avoided early morning or late afternoon. Mining at night-time is not contemplated. It is

anticipated that the tranquility of the area will not be detrimentally affected by the mining operation.

The workforce will not be housed on the mine therefore no noise generation at night would be applicable. Management of this impact during the day could be achieved via an environmental awareness programme. In addition, staff and contractors would be sensitized not to engage in unnecessary hooting, shouting, flapping of tailgates and use of exhaust brakes during operational hours. Maintaining speeds below 30km/h would assist in curbing noise impact.

The cumulative impact might increase in terms of mining, since the neighboring mine is still in operation and although in the final phases of the development. It is also understood that another application is underway further 500m south-west from this site, where drilling and blasting would occur, if the application is approved. All these activities will cumulatively increase the noise levels of the area, thus the cumulative impact is rated low-moderate, without mitigation measures implemented at the regulated sites.

Noise Impact

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Local	2	Local	2	Local	2	Site Specific	1
Duration	Short Term	1	Short Term	1	Short Term	1	Short Term	1
Intensity	Low	2	Medium	4	Low-Medium	3	Very Low	1
Probability	Probable	2	Definite	4	Likely	3	Probable	2
Cumulative Impact	Very low		Low-moderate		Low		Very Low	
Status	Negative		Negative		Negative		Neutral	
Confidence	High		High		High		High	
Significance	Very Low	10	Low-Moderate	28	Low	18	Insignificant	6

BUILDING RUBBLE

No crushing plant will be erected, no hydrocarbons will not be stored on site, no office will be establish, and a chemical toilet will be brought to site, thus no bund walls, foundations, ramp and septic tank needs to be constructed. Therefore no cement residue, brick residue, corrugated plate off-cuts, ceramic waste or PVC residue would be generated. At closure the mobile office and toilet will be removed.

Negligible impacts on soils, water, vegetation, air quality and humans are anticipated.

INDUSTRIAL WASTE

No industrial waste will be generated and zero impact is predicted.

DOMESTIC WASTE

The waste stream will consist mainly of domestic waste (food, bottles, plastic bags, paper, clothing, rags etc) and will be small and deposited in the containers provided for this purpose. Refuse bins will be clearly marked and placed at strategic places within the quarry area to encourage workers to use them. Considering that only 2-3 workers would be onsite during the day the waste stream would be limited. However, poor control over domestic waste handling could lead to littering the site and abutting properties and must be avoided since it could lead to livestock mortality. Due to the limited number of people anticipated on site, the limited waste stream will have negligible impacts on soils, water vegetation, air quality and humans.

MINE RESIDUE / SOLID WASTE

The geology of the area restricts the type of potential residue to oversize rock and root mass. Root mass can be stockpiled and worked into the topsoil as organic matter. Oversize material will initially be stored in the process area but later be returned to the excavation for rehabilitation. Initial storage will increase visual impact but once reintroduced to the pit it will have no impact on environmental parameters but rather have a positive attribute towards profiling the sides of the quarry concern.

The amount of surface vegetation to be removed ahead of the face will be negligible and will be returned to the profiled areas as mulch.

Since no chemical processes, mineral processing or washing plant is required on site no chemical/mineral waste will be generated. The impact is rated very low.

SEWAGE SYSTEM

The sewage system on site would be restricted to one chemical toilet that must be maintained properly to prevent soil and water pollution. The impact is rated very low.

HYDROCARBONS

No hydrocarbon storage, transfers or handling will take place onsite. Servicing of equipment and vehicles would be done off site therefore no hydrocarbon waste such as used oil, lubricants and hydrocarbon-contaminated filters will be generated. Any such material generated during emergency repairs will be removed from site immediately.

No wash bay or oil trap will be constructed as vehicles will be washed off site and all hydrocarbon spills will be contained within large drip pans.

SCRAP METAL

Since it is a mechanized operation a moderate amount of dysfunctional machine parts and scrap metal could be generated and will be stored within a designated area in the north-eastern section of the plant area. It will impact on the visual appearance of the site. The salvage section should be tidied up on a weekly basis and usable spares must be neatly positioned; uncontrolled stacking in the area should be avoided. It is therefore imperative that all unusable equipment and parts be regularly disposed off at an appropriate recycling facility.

At closure, all scrap metal and dysfunctional equipment will be sold to a commercial scrap yard. The post closure impact is rated insignificant.

Neighboring mining is done in a neat fashion and the site has not become prone to illegal dumping. If this application is approved, it will be regulated and waste will be managed, thus there will be very little cumulative impact related to waste. At closure all the waste will be removed and the site will be rehabilitated, thus eliminating the impact.

Impact of waste on the environment

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Local	2	Site Specific	1	Site Specific	1
Duration	Short Term	1	Short Term	1	Short Term	1	Short Term	1
Intensity	Low-Medium	3	Medium	4	Low-Medium	3	Very Low	1
Probability	Likely	3	Definite	4	Likely	3	Unlikely	1
Cumulative Impact	Very Low		Low		Very Low		None	
Status	Negative		Negative		Negative		Negative	
Confidence	High		High		High		High	
Significance	Very Low	15	Low-Moderate	28	Very Low	15	Insignificant	3

VISUAL IMPACT AND AESTHETIC ACCEPTABILITY

The proposed mine is bordered by relatively disturbed sites, like the neighboring mine, farms across the valley, residential and industrial areas to the south and other abandon mines further south-west. In between these developments, small patches of original vegetation occur, which is mostly restricted to the drainage lines and further north, beyond the small farms is the excellent Nahoon valley. The proposed site was also previously disturbed and the original coastal forest vegetation was removed to establish a grazing unit.



Figure 39: Neighboring quarry



Figure 40: Vegetation clearing to establish farms

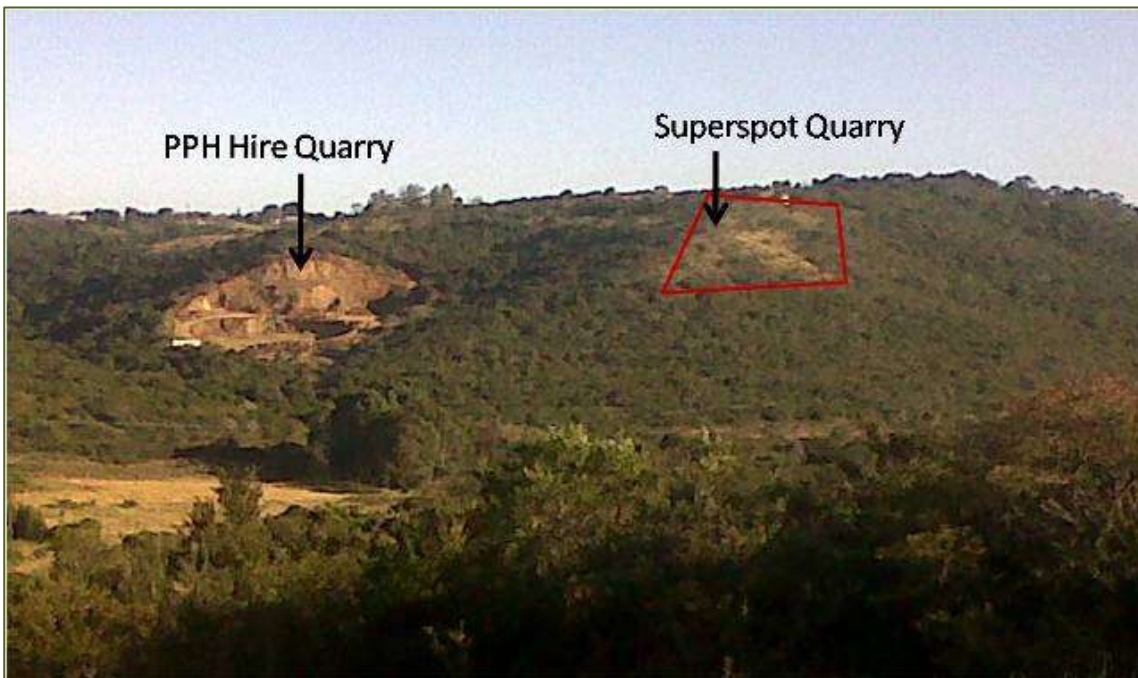


Figure 41: View from across the valley. Notice that the site earmarked for this application clear disturbance of vegetation is visible

The site position and topography of the site together with the vegetation screens/block the area completely off view from the east, west and south. However to the north the site will be in clear view, as can be seen in the above photo. Mining is an invasive activity in terms of visual impact due to the nature of the activity and unavoidable. However, through concurrent rehabilitation and correct mining methods, the impact will always remain temporary. Of importance is that this development is not near to any scenic route, but unfortunately there are residences across the valley and the tranquility of area might be impacted on from a social visual point of view, due to the reason given above. However, current mining on the neighboring site has not received any complaints and it is presumed that the local community has become accustomed to such activities.

During the construction and operational phase, mining will change the texture (vegetated to smooth) and color (green to brown) of the area and will increase visibility moderately and necessitates that production areas be profiled and re-vegetated concurrently with extraction activities. The construction activities are very low key and will not increase the visual impact immensely. Operational phase would be more invasive and would have a higher impact. The impact during the construction phase is rated low.

Mining will result in a box cut with sloped areas that will be readily absorbed in the landscape during the operational phase. Furthermore, the unnatural faces of the quarry will increase the onsite visibility extensively during excavation, but with the necessary dedication these production faces can be profiled to an acceptable landform. The structure of the soils in the area lends it towards effective rehabilitation and if rehabilitation is affected properly the mentioned impact will mostly be eliminated and will cause the post closure landscape to comfortably fit into the surrounding landscape. This will guarantee an acceptable post closure visual impact and aesthetic appearance. This impact is rated low-moderate at the start of the re-vegetation phase but once maturity has been reached, the impact would be reduced significantly.

No permanent infrastructure will be erected in the mining, but possibly one container and water tank will be erected, but will be positioned at the bottom first platform. On completion of the project, the infrastructure will be removed and the site will be re—vegetated. Stockpiles within the quarry would be low and it is not expected that it would cause the quarry operation to become more visible.

The haul road to site will also generate dust and depending on extraction rate will result in a dust cloud suspended above it. Considering the low traffic count and population density the impact is rated low. The extraction operation *per se* will liberate very low dust volumes into the air but will disperse quickly and the impact is temporary and rated very low.

Based on the above assessment the visual impact during mining is rated of low-moderate significance if the prescribed mitigation measures are implemented.



Figure 42: South view from the site



Figure 43: Northern view from the site



Figure 44: North-East view from the site



Figure 45: North-west view from the site

The cumulative impact will only increase if the new mine site is not rehabilitated and the neighboring mine site, thus obviously increasing the total area disturbed. Once the site is rehabilitated the area will be have a grass cover and be readily absorbed into the surrounds. Thus the cumulative impact is rated low.

Visual Impact

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Local	2	Local	2	Site Specific	1
Duration	Short Term	1	Permanent	4	Short Term	1	Short Term	1
Intensity	Low	2	High	6	Medium-High	5	Very Low	1
Probability	Likely	3	Likely	3	Likely	3	Probable	2
Cumulative Impact	Very Low		Low-Moderate		Low		None	
Status	Negative		Negative		Negative		Negative	
Confidence	High		High		High		High	
Significance	Very Low	12	Moderate	36	Low-Moderate	24	Insignificant	6

TRANSPORT IMPACT

The existing road network to gain access to the site; however a haul road would need to be constructed prior to mining to gain access to the site. Due to the incline of the hill and the position of the site on the hill the access road to the proposed mining site will be situated on a steep incline and needs to be constructed properly. The haul road will not be wider than 4m, will have a proper wearing course and must be protected against erosion by means of cross and mitre drains; spill out of these cross drains must be directed to the sides of the road into areas that are well established with vegetation, which will not lead to any erosion. This haul road will link the mine site with the gravel road north of the site, which is used by Eskom and PPH Hire quarry. The impact on the integrity of the haul road will be deemed of low significance when the necessary maintenance is provided, since only the applicant will be affected.

The gravel road used by Eskom and PPH Hire quarry was upgraded by the PPH Hire quarry and is in good standard to sustain additional heavy vehicles. Once the PPH Hire quarry closes, the impact will decrease, provided that the applicant continues to maintain this road in a good standard. Material from the quarry can be used to upgrade the road if necessary.

This gravel road will connect with a public gravel road which leads to the Eureka suburb and Voortrekker Road (the R102). The structural integrity of the Eureka public gravel is currently in a fairly average condition. It is a broad road with the capacity to carry heavy vehicles. It will

experience an additional impact on structural integrity once mining commences, which will contribute to the cumulative impact. Potholes and edge breaking commonly results when roads are not maintained and upgraded, thus this road will should be upgraded from time to time and material from the quarry may be used as a wearing course. The maintenance of the this road is however the responsibility of the Department of Roads & Transport or Buffalo Municipality and the necessary consultations need to take place since this impact will continue unabated. It is however important that the necessary safety precautions be taken. Line of sight is good to the left and right and drivers will be sensitized on safety procedures and only skilled drivers will be appointed.

Furthermore, safety risks for motorist could increase with the increase in heavy vehicles on any road. Cyclists and pedestrians will also experience a similar risk and truck drivers will be sensitized on the matter. It is therefore understood that heavy vehicles will slow down vehicles on these roads and increase the safety risks, and thus the impact is rated low-moderate on the Eureka public gravel, considering the contribution to the overall freight that is hauled on this road.

The R102 will also connect with the N2, and both roads are in good condition. No significant impact is anticipated in this regard, since both roads were constructed for the carrying of heavy vehicles on a constant basis. Road safety is of importance and truck drivers must be informed accordingly and be sensitized towards displaying proper road etiquette. The low production rate at the mine will allow not more than 8-10 trips (both ways) per day hence the impact on traffic would be low. Once mining is terminated, the internal haul road will be retained.

Access to the public gravel road will result in some safety risks and the necessary heavy vehicle signage must be erected on both sides of the access as per the specifications of the District Roads Engineer. During periods of extensively increased extraction rates a flagman must secure the access. Due to the size of the operation the significance of the impact is rated low.

Traffic Impact

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Regional	2	Sub Regional	3	Sub Regional	3	Site Specific	1
Duration	Short Term	1	Short Term	1	Short Term	1	Short Term	1
Intensity	Low-Medium	3	High	6	Medium-High	5	Low	2
Probability	Likely	3	Definite	4	Likely	3	Unlikely	1
Cumulative Impact	Low		Moderate		Low-Moderate		Very Low	
Status	Positive		Negative		Negative		Negative	
Confidence	High		High		High		High	
Significance	Low	18	Moderate	40	Low-Moderate	27	Insignificant	4

SOCIO -ECONOMIC IMPACT

It is very important for any mining application to consider the social impacts, whether it is beneficial or harmful to the surrounding community. Weathered dolerite is a sought after commodity in the East London area and will have a positive contribution to the local economy.

The development of the quarry will have no impact on agricultural activities therefore no losses will occur. The quarry will generate permanent and casual work for a number of people and must be seen as a further positive contributor to upliftment of inhabitants of the area.

On the other hand, developing the quarry could potentially pose some social impacts on residents in terms of visual, dust and noise pollution, impact on the traffic and road integrity, safety issues on farms, and cattle theft, but with the mitigation measures described elsewhere, these impacts could be reduced to acceptable levels. In addition, since only two-three people are employed onsite, it would not stimulate any mayor influx of labour that can cause a social disturbance in the form of squatting. Also, people will not be housed onsite that could lead to social disturbances.

The increase in traffic will however have a low-moderate impact on the community utilizing the public gravel road and people staying in Eureka in terms of dust, noise, road safety matters and

deteriorating road conditions. The land is private property therefore no impact is contemplated in terms of loss of cultural and social utilization of the coastal forest vegetation. No need for relocation of people has been identified.

Since the site is not located near any public vantage point or being regularly visited by tourists the impact on the local tourist industry is rated negligible. The site visit revealed no walking trails or any hint that it is used by tourists.

Since operational hours will be restricted to daytime, light pollution at night is not a consideration. Based on the above, the overall social-economic impact is rated positive. There are also no cumulative socio-economical impacts, since this will be one operating mine.

Therefore, it is expected that should the guidelines of the EMP be followed, no complaints will be expected and there will not be any social negative impacts. Thus, only positive social impact remains as the site will provide economical growth for the area.

Impact on the Socio-Economic Impact

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Local	2	Local	2	Local	2	Local	2
Duration	Short Term	1	Short Term	1	Short Term	1	Short Term	1
Intensity	Very Low	1	Medium-High	5	Low	2	Low	2
Probability	Likely	3	Definite	4	Likely	3	Unlikely	1
Cumulative	Very Low		Low-Medium		Low		Very Low	
Status	Positive (economic attributes outweigh the negative social impacts)		Negative		Positive (economic attributes outweigh the negative social impacts)		Negative (Loss of jobs and income and less spin-offs)	
Confidence	High		Medium		Medium		High	
Significance	Very Low	12	Moderate	32	Low	15	Insignificant	5

As previously discussed, these sites represent the heritage of communities and are therefore protected in terms of current legislation. In addition all material/buildings older than 60 years are protected.

At the site, there is no heritage building, graves or other sites noted and since mining will be done in a disturbed area the possibility of finding any archaeological feature is unlikely. The mining area is not situated near any of the listed sites and would therefore not impact on the declared heritage sites.

During the construction phase no activity will cause any impact on the heritage buildings and the impact is rated insignificant.

It is however required by law, and thus an archaeological survey and report must be completed and submitted to the DMR prior to mining. Although no impact is envisaged, the operators of earthmoving equipment will be informed of the company's obligation in this regard and to inform management when anything of interest is noted on the site.

Dr. Binneman at the Albany Museum in Grahamstown and SAHRA office in East London are qualified to conduct this survey and will also be contacted immediately if any object of importance is observed and all operations would be suspended immediately.

Since there are no heritage sites on the mine area, there is no cumulative impact.

Impact on Archaeological and Cultural Resources

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Sub Regional	3	Sub Regional	3	Site Specific	1
Duration	Short Term	1	Short Term	1	Short Term	1	Short Term	1
Intensity	Very Low	1	Low-Medium	3	Low	2	Very Low	1
Probability	Probable	2	Likely	3	Probable	2	Unlikely	1
Cumulative Impact	None		None		None		None	
Status	Negative		Negative		Negative		Negative	
Confidence	High		High		High		High	
Significance	Insignificant	6	Low	21	Very Low	12	Insignificant	3

POTENTIAL IMPACTS ON COMMUNITIES, INDIVIDUALS OR COMPETING BUSINESSES

As previously discussed, the impacts the community will experience due to this mining venture will be limited to those listed under the heading “Socio-Economic”.

In terms of competing land uses in close proximity: the neighboring mine is in the final phases and will soon be closed. Thus the new applicant will be in a position to provide for existing clients of PPH Hire material, which will benefit the buyers and negotiations in this regard is underway between PPH Hire and the new applicant. Therefore any other mining company will not have any direct competition from this application and would not be impacted on through the possible loss of clients or under cutting market prices. Thus there is no risk of out competing another company.

This mining concern will not impact any land use, as mining is temporary and after rehabilitation will be restored to a grazing unit and would have created sufficient platforms. Thus the landowner will be able to use this portion of land for a grazing unit in the future.

This site also host grass vegetation with no vegetation of medical concern that local communities might benefit from.

REMEDIAL MEASURES: TOPOGRAPHY

- Quarry must be developed as described under the heading 'Mine development', with clearing of vegetation and rehabilitation bench by bench.
- The impact on the topography of worked out areas will be remedied by means of, cut-and-fill profiling and stabilizing production faces.
- Mining shall not progress beyond the approved mine area, but 4m tolerance outside of the mine area will be given for the sole purpose of sloping, to ensure that the final bench does not have a slope too steep to rehabilitate.
- The production faces to be profiled as described in the mine development plan in such a way that sharp angles are prevented but that flowing curves are formed instead that blend with the surrounding landscape.
- All the slopes shall be profiled to a minimum slope of 1:2 gradient. Profiling will be done in such a way that sharp angles are prevented but that instead flowing curves are formed that blend with the surrounding landscape.
- Each bench platform will have a 1:20 gradient towards the south-west, to act as an energy breaker for storm water run-off.
- Any oversize rock that the quarry may generate must be stockpiled on the northern-eastern perimeter and once a section of the quarry is mined out it will be stacked at the bottom of production faces to improve slope profiles, be top dressed with topsoil and vegetated.
- Each bench shall be fully profiled within 60 days after mining in a particular bench ceased and will be fully vegetated within 12 months.
- Any root mass that the quarry generates must be used during the rehabilitation of the site.
- No areas outside the authorized mine area will be disturbed.
- A photographic record must be kept and complemented six monthly and must accompany the six-monthly performance assessment report.
- No stockpiles shall remain at closure.
- Stockpiles will be kept as small as possible.
- The slopes will be protected by means of diversion drains.
- The post rehabilitation topography will result in a box cut into the hill with the highest face in the southern-western side, following the natural incline of the area with three benches.
- All infrastructure shall be removed at closure.

REMEDIAL MEASURES: GEOLOGY

- The minimum working area for an efficient and effective operation should be utilized and demarcated prior to the start of mining activities and the excavator operator must be informed in this regard.
- No mining will be undertaken in areas where reserves have not been adequately proved in order to avoid unnecessary/wasteful mining.

- Mining will be restricted to the proposed depth as described under the heading 'Mine methodology'.
- No activities will be permitted outside the approved mine area.
- All oversize material and overburden will be used in profiling the production faces of the quarry. This material will be covered with overburden or weathered dolerite, compacted; top dressed with topsoil and vegetated.
- Oversize material will be stored neatly on the north-eastern perimeter of the mine.
- Runoff from denuded surfaces shall not cause erosion dongas and topographical changes.
- All spill areas of storm water control structures shall be protected against erosion.
- Storm water control structures shall be constructed as per the details provided under the chapters on construction activities and handling of soils.
- All root mass, will be returned to the excavation or used in profiling the production faces and rehabilitation.
- Quarry development will take place with final rehabilitation objectives in mind.

REMEDIAL MEASURES: SOILS

Topsoil:

- All *in situ* soils (at least 40cm) will be removed and conserved during future development stages and will not be sold. With the development of the first platform, the topsoil will be stored along the north-eastern side of the mine area, to be used for rehabilitation when mining cease. The rest of the topsoil will be stripped ahead of each bench and stored on the sides to be used concurrently with mining while rehabilitating. It will be piled to a maximum height of 1,5m not to negatively affect microbial action and the mineral cycle through compaction.
- Once removed, topsoil will be seeded with the specified seed mixture, upgraded with inorganic fertilizer and irrigated if possible/needed.
- Mining will be restricted to the approved mine development plan, with concurrent rehabilitation and slope development as focus, and mine area.
- The amount of soil removed ahead of the production face will be reduced to the minimum required for optimal development.
- Removed topsoil will not be mixed with sub-soils.
- If needed topsoil stockpiles will be protected from wind action by erecting shade cloth screens (1,8mhigh) across the wind path or cover it with Hessian.
- Topsoil will be reintroduced to disturbed areas and fertilized as follow:
 1. Initially at a rate of 200kg 2:3:2 (22) Zn and 150kg 4:1:1 per hectare before seeding.
 2. Once the grass seedlings has reached a 15cm height applications of super phosphate at a rate of 150kg per hectare twice per annum (March & September) will be effected. Seeding will coincide with the rain season or when soil moisture regimes are good. The application of manganese and boron will also be investigated if re-vegetation does not progress satisfactorily.
 3. All vegetation removed from the mine area will be stockpiled, protected against wind erosion and re-introduced as mulch to seeded areas.
 4. In the event that the removed vegetative material is deficient the applicant undertake to obtain all available manure/chipped vegetative matter (without alien seed) and introduce

it to profiled areas to improve the fertility and micro-climate of the soil, which in turn would facilitate improved germination and percentage soil cover.

- In addition some creeper plants can also be planted to fast track the stabilization of the soil once it is replaced, especially on the slope areas, to prevent erosion.
- Upgrading of soils and re-vegetation of disturbed areas will be done concurrently with mining.
- If overburden is used for shaping and sloping then once the slope is profiled the production face will be rough and coarse and topsoil could easily be lost in the crevices between rocks. To counteract this impact adequate weathered dolerite must be obtained to cover the shot rock and to establish a proper root horizon.

Erosion:

- All erosion gullies on the mining area and on the faces would immediately be filled in and compacted and erosion-monitoring programme will be implemented as a cradle to grave process.
- Storm water control structures, e.g. the diversion trenches, will be retained and maintained until closure.
- The platform areas that will be establish and will be fairly flat with a gentle 1:20 gradient towards the south-west where a diversion trench will be constructed. Each trench must be sloped to curve this section of the platform to the north and south so that storm water will be diverted off the platform, into the diversion trench and into the drainage channels next to the site.
- The diversion trenches or earth drains on each platform will be constructed as the next bench is developed and will be 20cm deep and 60cm wide. Inside each drain small rock heaps acting as energy dissipaters should be positioned every 20m. Monitoring will take place throughout the lifetime of the mine to ensure that the mining operation does not cause erosion in the drainage areas.
- If needed, runoff on the slope areas will be diverted with contours to the northern and southern drainage line next to the quarry, once the topsoil is reintroduced.
- These contours must spill in silt traps, provided with a proper spillway to prevent siltation of the immediate surrounds. Due to the length of the affected area erosion within contours must be prevented with in-channel dissipation measures.
- The quarry will be developed in such a manner that slopes are smooth to prevent concentration of surface water on them that could stimulate erosion.
- Should erosion on the slopes become problematic:
 1. Any erosion rills or gullies that develop will be filled in with subsoil, compacted but upper layer to be scarified to bind with topsoil, top dressed with soil, fertilized and seeded.
 2. Such areas will be provided with a mulch/manure layer of at least 5cm thick.
 3. Trunks/branches of trees removed (non seed-bearing alien trees) will be placed in rows along the contour 5m apart and pegged to the ground to reduce water speed and curb erosion.
 4. In worst case scenario geofabric or Soil Saver (natural organic sheet material with seeds) will be pegged onto the slopes after spreading of topsoil and seeding was effected. A soil conservation officer or expert will be appointed to oversee the process.

5. If wind erosion becomes a problem, shade cloth screens will be erected (north-south direction) across the wind path every 20m. Shade cloth will be properly attached to 2,5m (1m sub-surface) wooden poles and shade cloth will stretch to the ground surface.
- Once the weathered dolerite is removed and the topsoil replaced, the disturbed area must be seeded with the specified seed mixture.
 - The amount of vegetation removed ahead of the production face will be reduced to the minimum required for optimal development.
 - Mining will take place progressively as per the mine plan provided.
 - The mining phases will be developed and rehabilitated to reduce the extent of the disturbed area and prevent erosion.
 - Only existing haul roads to the quarry area will be used and vehicles would not deviate from it. Movement of vehicles in the quarry area will be limited to what is necessary to reduce potential impact on areas outside mine boundary.
 - Haul roads could be protected with a proper wearing course of at least 30cm. Cross drains every 30m and appropriate side/mitre drains will be established to the side of the road.
 - Disturbance of the soil and vegetation zones around the quarry will be prohibited.
 - Portions of production areas will be profiled and vegetated as an integral part of mining.
 - Vehicles will not drive over rehabilitated areas to prevent dieback of established vegetation.
 - Any erosion that develops will be filled in with gravel and compacted, covered with topsoil and seeded.

Waste:

- No fuel, oil and lubricants will be stored onsite.
- Emergency repairs will be done over drip pans.
- Maintenance of vehicles will be done at the offsite workshop to a leak free condition.
- Hydrocarbons shall not be drained into the soils nor shall used filters and hydrocarbon-contaminated parts be buried at the site, but will be removed to an approved waste site or recycling facility.
- Making use of bio-remediation facilitated by a specialist company will negate larger spills whilst smaller spills could be treated with fertilizer to break it down or be scooped up by front-end loader to a hazardous waste site.
- Peatsorb or sawdust will be used to contain larger spills and some of this material must be on site as a contingency measure.
- No other hazardous chemicals will be used at the site.
- The chemical toilet will be maintained according to Municipal bylaws or specifications issued by a local Health Inspector.
- In case of emergencies used oils and lubricants will be siphoned in receptacles with proper lids and be disposed of at a registered recycling facility immediately.
- For emergency cases, a receptacle will be provided for used filters and oil contaminated vehicle parts and will be respectively dispose of at a registered waste facility and scrap yard immediately.

Closure:

- At closure all stockpiles must be removed for the reinstatement of soils and establishment of vegetation percentage surface cover on the final bench area.

- Storm water control structures will be retained and maintained until closure is granted. If needed a soil conservation officer or expert will be employed to assist in constructing storm water control structures.

REMEDIAL MEASURES: LAND USE

- Mining will be restricted to the approved mine area.
- All *in situ* topsoil removed shall be conserved and handled as prescribed under 'soil remedial measures'.
- The quarry will be seeded with the prescribed seed mixture to ensure a surface cover that will stimulate the return of other plant species.
- Alien plant infestation will be prevented through an alien eradication programme.
- Rehabilitation and bench sloping will be done concurrently with mining and in phases as proposed by the mine development plan. Progress will be monitored and audited against proposed rehabilitation schedule to improve land use options and land capability.
- The slopes shall be profiled to such an extent that the area could be used for grazing and recreational purposes/semi-wilderness land. Rehabilitated areas would not be grazed by any domestic animals within two years after closure was granted.
- No fires would be allowed on the property to safeguard the land use of the property as well as those of abutting properties.
- Production areas/faces will be made stable/safe.
- At closure, the internal haul road would either be rehabilitated or left in a good and non-eroded state, depending on the land owner.

REMEDIAL MEASURES: FLORA

With a vigorous grass re-vegetation programme, it will create an improved micro climate and niche that will encourage certain species to re-colonize rehabilitated areas and the specie composition and diversity will improve over time. The success rate of re-vegetation will however, depend on concurrent rehabilitation approach, wetting and a post-rehabilitation maintenance programme being followed.

- Mining would be restricted to the areas demarcated by the mine plans and no vegetation outside the demarcated mine boundaries will be removed with specific emphasis on the drainage line outside of the mining area. On the boundaries a tolerance of 4m will be maintained for the sole purpose of profiling the sides to a sustainable slope.
- The rehabilitation plan will be implemented in accordance with the time frames set. A phased re-vegetation programme as discussed under 'mine development' will be followed to ensure timeous rehabilitation of disturbed areas in order to increase control over the process and to limit irrigation required.

- Indigenous vegetation outside the mine boundary shall not be affected by mining activities. Furthermore, no vegetation outside the mine areas will be removed and spread of alien vegetation will be prevented.
- All indigenous plant species that can be transplanted will be removed from mine areas, potted and be used during the rehabilitation phase.
- Only the approved haul road will be used and vehicles will not traverse virgin land.
- The haul road will not be wider than 4m and will be maintained to prevent erosion.
- All slope areas will be properly stabilized through compaction to ensure proper establishment of grass cover.
- The mining area will be reclaimed to a grass cover supplemented with indigenous creepers through infill planting on the slope areas. Disturbed areas will be re-vegetated with a grass cover by seeding with:

Eragrostis curvula	Themeda trianda	Sporobolus africanus
Digitaria eriantha	Panicum maximum	

- None of these grasses poses any threat of proliferation. Seeding would take place in the spring from August to October and in autumn from March to middle April at an application rate of 3-5kg/ha of each specie mentioned.
- *Clematis brachiata* seeds will be sown in spring or cuttings of semi hard wood of the plant can be planted throughout summer on the slope areas.
- *Jasminum multipartite* must be planted where topsoil are spread over weathered dolerite or over discarded boulders in shady areas and not on areas where the subsoil is solid dolerite on the slopes. The *Jasminum* can be planted from semi-hardwood cuttings made in spring and summer when plants are actively growing. Or spreading of the plant by layering runners/suckers from the plant as is sowing seed is also very successful.
- Seed will be broadcasted by hand and areas will be raked to cover seed and protect it from birds feeding in the area. Seeding, germination and surface cover will be monitored on a continuous basis. This vegetation cover would require the minimum maintenance and will within a short time improve the visual appearance of the site. Maintenance will be carried out until closure was granted.
- All root mass recovered after mining could be pulverized/mulched and reworked into the topsoil.
- Juvenile alien trees will be pulled and removed to the northern platform onto an area cleared for stockpiling where it will be burnt when it is dry.
- Once the area has been vegetated, a continuous alien control programme will be implemented by pulling any seedlings on a weekly basis. No plant and tree will be left until it reaches seed bearing age. Where applicable herbicide such as Garlon in diesel will be applied to tree stumps. Specific attention will be directed to black wattle (*Acacia mearnsii*) and the Blue Gum (*Eucalyptus globules*), but others also included: castor oil plants (*Ricinus communis*), cestrum (*Cestrum laevigatum*), lantana (*Lantana rugosa*), *Pinus* specie, *Solanum* specie, *Cassia didymobotria*, and *Syringa* specie.
- Once an area is vegetated, no traffic will be permitted in such area, except for on the approved haul road. Driving in non-mining areas will be prevented.

- Veld fires will be prevented since it could affect the surrounding residents, the vegetation, as well as impacts on soil stability and fertility. No fires will be permitted in the mining and the required fire extinguishers will be made available.
- Should re-vegetation be exceptionally slow due to dry conditions the seeded area will be irrigated once per week with a sprinkler until a sufficient ground cover has been established. Water for irrigation purposes will be bought from the Municipality.
- Should re-vegetation fail due to climatic conditions it will be repeated the following growing season.

REMEDIAL MEASURES: FAUNA

- Handling of fuels will be in accordance with all applicable legislation to prevent pollution incidents.
- Movement of vehicles will be restricted to the authorized mine area.
- No animals entering or settling in the mine area will be disturbed or killed and this requirement will be included in the environmental awareness programme, which must be discussed with workers on an annual basis by the owner of the proposed quarry but preferably by a competent environmentalist.
- No hunting or snaring would be allowed outside or inside the mine area and the applicant will implement a severe penalty system for people transgressing this requirement. In addition, the owner or manager will remove any of the staff caught interfering with wildlife from the site immediately.
- All animals found on working areas where they may be injured, will be relocated to areas outside the mine area.
- Nesting sites will be temporarily excluded from the mine area or be carefully relocated.
- Areas to be cleared will be swept before vegetation is removed. Relocate any herpetofauna and slow moving animals to areas outside the mining areas.
- Disturbed areas will be properly rehabilitated as per the process outlined in the re-vegetation programme.
- Veld fires will be prevented by not allowing any open fires in the mine areas or smoking outside the mine areas.
- Mining area will be clearly demarcated and areas outside it will be out of bounds.
- Production faces will be profiled properly to ensure that it does not hold any danger to animals and to facilitate proper re-vegetation.

REMEDIAL MEASURES: WATER

- Production faces will be protected against erosion to prevent increased silt transport by means of the mechanisms stipulated in the chapters on the construction phase and soil management.
- Mining will be restricted to the proposed depth and footprint.
- Disturbed areas of the mine will be vegetated as soon as possible and as per rehabilitation plan.

- Haul roads to be protected against erosion by construction of cross drains and mitre drains diverting water into the sides of the road into well established vegetated areas.
- Vehicles will not use alternative roads or damage vegetation outside the approved mine boundary.
- The chemical toilet will be maintained to Municipal specification, will be inspected on a regular basis and be located within the excavation.
- No storage of hydrocarbons will take place onsite.
- No foreign or unapproved material/substance will be dumped or stored within the footprint of the mine area, with specific emphasis on post closure use.
- Waste will be contained in receptacles stationed at appropriate areas within the excavation and be removed from the quarry area on a weekly basis or whenever necessary. No household or industrial waste will be burnt or buried on the site.
- Refueling of vehicles will be done offsite.
- Only emergency repairs will take place at the site and must be done over a drip pan.
- Vehicles/equipment shall be maintained to a high standard and shall not display any major leaks.
- Any contaminated spares, oil filters and gaskets will be placed in a suitable receptacle and immediately removed from the property to an approved facility.
- If spills do occur, the affected soil will be removed to an approved waste site. Super absorbing material such as Peatsorb or Spillsorb or alternatively sawdust will be kept onsite and used to contain any potential spills.
- In case of large, critical spills the Departments of Water Affairs and DMR will be informed immediately for assistance and advice and a competent company conversant with bio-remediation will be appointed as soon as possible to address the possible impacts of such spill. All costs would be for the account of the applicant.
- Management will not entertain hydrocarbon spills on site and where necessary, financial penalties would be imposed on workers in cases of negligence.
- No hydrocarbons or hydrocarbon-contaminated material/parts will respectively be drained in the soil or buried on the property.
- All dysfunctional equipment and vehicles will be immediately removed from site.
- The applicant accepts the principle of 'polluter pays'.

REMEDIAL MEASURES: AIR QUALITY

- Vehicles to be maintained properly and fitted with standard exhaust systems and will not be left idling unnecessary.
- Vehicle trips must be restricted to what is essential.
- Comply with Mine Health and Safety guidelines at all times.
- No cooking fires will be allowed on the property.
- No chemicals will be stored or disposed off on site.
- Wearing course of haul roads in process area will be upgraded when necessary to reduce dust generation.

- Waste will not be burnt on site. Waste will be retained in proper receptacles placed at the site and removed regularly to the waste site. The waste stream will be limited and be removed from site weekly to prevent odours from occurring.
- The mine will be developed in phases to reduce the extent of exposed areas.
- Disturbed mine areas will be re-vegetated as soon as possible as per the re-vegetation plan.
- During periods of high winds and liberation of excessive dust volumes, disturbed areas will be watered down by means of a sprinkler system or water cart. Equipment for this purpose must be obtained as soon as possible on approval of the EMP. If needed, shade cloth windbreaks (10m apart, 2,5m high) will be erected.
- If dust levels in the process area necessitates, 3m high shade cloth windbreaks will be established around individual stockpiles with access point opposite from prevailing wind direction.
- No stockpiles will be retained for long periods in the mining area that could result in a source of dust.
- Handling of material during periods of high wind action will be avoided as far as possible if it leads to unacceptable dust generation. Should irrigation be ineffective during such adverse climatic conditions quarry operations shall cease. The management system will allow for monitoring the situation over weekends when no workers are on site.
- Topsoil will be reintroduced to mine areas as soon as possible and irrigated immediately after placement.
- The chemical toilet shall be regularly serviced as per Municipal guidelines.
- Speed of vehicles will be restricted to 30km/h.
- Dust counts must be done whenever the DMR requires such measurements and the outcome of the dust sampling presented to the DMR.
- The terms of reference for the dust counts must be determined in conjunction with the officials from the DMR.
- This potential impact should be addressed in an environmental awareness programme.

REMEDIAL MEASURES: NOISE

- All vehicles will be fitted with standard exhaust systems and be regularly serviced.
- Unnecessary hooting, shouting, flapping of tailgates and use of exhaust brakes will be discouraged and be penalized where necessary.
- Unnecessary idling of vehicles will be discouraged.
- Traveling speed on the internal haul road will be reduced to 30km/h.
- Moving parts of vehicles will be regularly lubricated, replaced and serviced.
- Repair work that involves using grinders and hammers on steel or any other steel on steel activity must not be done early morning or early evening and preferably at an offsite workshop.
- Normal working hours will apply for weekdays (7:30am-5pm) and Saturdays (8am-1pm) if necessary (will liaise with property owners) – No work on public holidays or Sundays.
- Workforce and contractors will be properly managed in terms of noise generation and be informed on acceptable behavior.

- Protective ear devices will be provided to all operators of machinery/vehicles generating noise above 50dB at source.
- All Mine Health and Safety guidelines must be complied with.
- Truck drivers will be tasked to use exhaust brakes sparingly.
- No campsite will be established in the mine area.
- This potential impact should be addressed in an environmental awareness programme.

REMEDIAL MEASURES: WASTE MANAGEMENT

Building rubble:

- No building rubble should be generated at the site, but in the small event of generation, then staff would be trained to distinguish between various types of building rubble.
- Rubble will be neatly stored in a demarcated area close to the area earmarked for the crusher and if applicable will be dampened if it produces dust.
- General rubble will be disposed off within a month after completion of the construction phase at the local waste facility and other, such as metals will be sold to a recycling company.

Industrial waste:

- An area will be cleared and demarcated for industrial waste, if needed. Tyre casings will be disposed of as soon as possible at the nearest registered waste facility or be sold to a recycling facility.
- Dysfunctional equipment shall be sold to a recycling company or disposed of at a hazardous waste site, depending on the nature of the materials involved. All vehicle batteries shall be recycled to a facility like e.g. Midas or be removed to a hazardous waste facility. Staff will be informed on the hazards and correct manner to deal with waste stored at the quarry.
- The odd tyre casings and dysfunctional equipment that could be generated, will be disposed of immediately at the nearest registered waste facility.

Domestic waste:

- Domestic waste generated ancillary to the mining process will be deposited in containers with scavenger proof lids placed at quarry. It will be weekly removed from site to the nearest waste site and not dumped in the veld.
- Containers will be clearly marked to ensure that they are used for the right purpose. Management will provide clear management guidelines and this aspect will be included in the environmental awareness programme.
- During the project a skip with a proper cover will be positioned in the mine area. Large refuse bins fitted with a proper lid will be positioned at the various work stations in the quarry and office area and be emptied on a regular basis in the skip.
- Domestic waste will neither be dumped in the surrounding veld, nor burnt nor buried on site.

- Any foul smells will be treated with the necessary disinfectants or lime can be introduced to the bottom of the receptacle.
- A cleanup will be done on a monthly basis.
- Staff will be equipped to distinguish between domestic waste and industrial waste.

Hydrocarbons:

- Vehicles may not leak any fuel, oil or lubricants and will be maintained to an acceptable standard.
- Any fuel spills will be cleaned up immediately and the soil from spill areas to be removed to an approved waste disposal site.
- All hydrocarbon-contaminated material, including soil to be disposed at a hazardous waste facility. Affected soil will be treated with fertilizer/surfactants or bio-remedied by a specialist in case of any large spills.
- No hydrocarbons will be stored at site or drained into the soil.

Scrap metal:

- The salvage yard will be neat and all usable material will be placed in rows and separated in applicable categories.
- Unusable scrap metal or dysfunctional machinery will be positioned on one side and removed on a monthly basis to a recycling facility.

Mine Residue:

- Oversize boulders will be returned to the quarry floor and be covered with weathered dolerite before it is top dressed with topsoil.
- All topsoil to be removed on identified phases and areas will be used in the rehabilitation process.
- All vegetation removed will be used as organic material in the rehabilitation process.
- At closure all remaining stockpiles will be flattened and reintroduced to disturbed quarry areas within 3 months and the topsoil stockpiles reintroduced to disturbed quarry areas.

Sewage system:

- A chemical toilet will be placed at the quarry and it will be regularly serviced and emptied at an approved waste site in East London. A Health Inspector should inspect the system and surrounds annually.
- Strict controls will be enforced to ensure that the surrounds are not use as ablutions and this aspect would be included in the environmental awareness programme.

General:

- No day to day repairs or servicing of vehicles or equipment will take place on site.
- No washing of vehicles will take place on the property.
- Facilities will be maintained and kept neat on a continuous basis.

- A general clean up of the property will be done on a weekly basis and before every year end closure and all personnel will be involved to establish a sense of pride in achieving a clean environment.
- None of these wastes will be buried/drained into the soil.
- Facilities must be cleaned up and will be maintained and kept neat on a continuous basis.
- At closure, all waste will be removed from site and all machinery.
- The handling of all waste will be included in an environmental awareness programme.

REMEDIAL MEASURES: VISUAL IMPACT

- No vegetation clearing will take place outside the proposed mine area during the mining operation.
- Reduce visual impact through proper re-vegetation.
- Mining areas will be re-vegetated to a 50% cover during the first year, a 70% cover in the second year.
- The proposed mine areas will be kept clean and free of litter on a continuous basis. A weekly clean up of the entire site will be done.
- No dumping of waste will be allowed on the property.
- Disturbed areas will be progressively developed and rehabilitated as indicated under 'quarry development'.
- The sides of the quarries will rounded off through a cut and fill action as described in the mine development plan.
- Cuts will follow curvilinear lines, which will blend in with those of the surrounding landscape, rather than straight geometric lines.
- Alien vegetation will be removed on a continuous basis to ensure that established natural vegetation is not again out competed.
- Excessive dust plumes within the mine area or on the haul roads will be eliminated through wetting.
- Dust plumes within the mine area, plant area or on the haul roads will be eliminated through wetting when required.
- Visuals will be drastically improved at closure of the mining concern.
- At closure, all disturbed areas would have been rehabilitated as per the re-vegetation plan and all mobile infrastructure will be removed and disturbed areas be rehabilitated as per the re-vegetation plan.

REMEDIAL MEASURES: TRAFFIC

- All vehicles will be properly maintained in accordance with Eastern Cape Roads Act 3 of 2003.
- All drivers will display the necessary road etiquette and dispose over applicable drivers licenses and this aspect will be included in the environmental awareness programme.

- No unnecessary hooting would be permitted.
- Vehicles entering the Eureka public gravel road as well as the R102 and N2, or any other road will come to a complete stop before entering the road and any transgressions in this regard will be heavily penalized. All contractors will sign a letter of agreement to this effect.
- The haul road and gravel road to the site must be upgraded and protected with the wearing course during the construction phase and be maintained throughout the lifespan of the mine.
- The road must be protected against erosion by means of cross and mitre drains; spill out of these cross drains must be directed into areas that are well established with vegetation, which will not lead to any erosion.
- The Bell Mouth at the entrance to the Eureka gravel road must be maintained and kept in good condition.
- All vehicles visiting the quarry shall be road worthy and will be included in the agreement with contractors.
- Overloading will not be permitted. Speeding will be prohibited and drivers will be penalized should it be proved that this requirement is contravened.
- Hauling of material will only mostly commence at 08:00 and ceases at 17:00 on week days. No vehicles may park along the road outside the mine area before or after the said times.
- The appropriate signage (W107 & W108 –1,2m size) will be erected on both sides of the access to the Eureka gravel road and will be maintained in collaboration with the District Roads Engineer.
- The District Roads Engineer will be consulted on the maintenance of the roads to be used.
- If poor visibility or slow access of vehicles onto the Eureka gravel road could result in any accidents, a flagman will be used at the access.
- Internal haul road will be maintained to an acceptable standard to prevent erosion and maintain safety standards and kept after closure.

REMEDIAL MEASURES: SOCIO-ECONOMICAL

- Those described under previous headings plus establishing regular meetings with nearby neighbours.
- No wandering of any quarry workers on any area outside the quarry area, especially onto the neighboring property.
- No stock theft or poaching will be tolerated by the workforce and any person found guilty of these transgressions will be removed from the property, dismissed and handed over to the police for sentencing. Landowners will be fully compensated for stock loss.
- No wood will be gathered from outside the mine area and no plant or crop will be removed by the workforce. Any transgressions in this regard will result in disciplinary action being taken and the guilty party being removed from the property.

The amount calculated is required for the rehabilitation of environmental damage caused by the operation and makes provision for premature closure and worst-case scenario. This amount reflects the cost should the Department has to rehabilitate the area disturbed in case of liquidation or abscondence of the holder. In this regard it should be noted that only one quarry will be developed at a time and this serves as an undertaking to this effect.

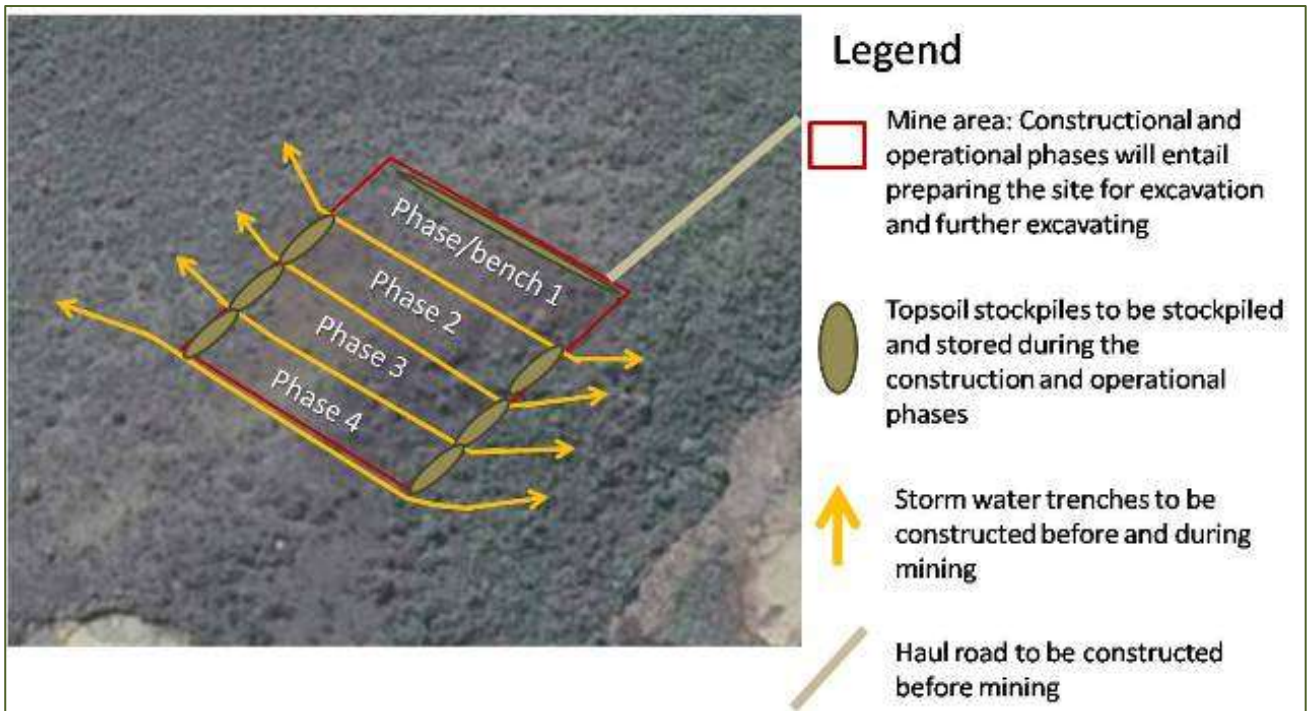


Figure 46: Aerial extent of the main mining activities during the construction and operational phases.

GENERAL

Tendering process & advertisement = **R2000**
 Transport of equipment = **R4000**
 Supervision fees and reporting = **R5000**
 Aftercare –Seeding/planting and monitoring = **R5000**
 Contingencies = **R15 000**
Sub-Total = R31 000

MINE AREA (PHASE 1 – SIMILAR AMOUNTS WOULD BE REQUIRED FOR EACH ADDITIONAL PHASE)

Cut and fill of production face = **R50 000**
 Profiling of quarry floor = **R10 000**
 Spreading of topsoil = **R15 000**
 Seeding and fertilising @ R3000 per ha = **R1 500**
 Irrigation = **R5 000**
 Removal of waste, scrap metal and redundant equipment etc = **R3 000**
 Removal of overburden & oversize = **R50 000**
 Storm water control structures = **R25 000**
 Aftercare = **R50 000**

Sub-Total = R209 500

Grant Total = R240 500

A financial guarantee to the value of R70 000 will be made available to the DMR before approval. It is proposed that the applicant submit additional payments of R70 000 per year for a total of four years. Should the applicant fail to rehabilitate each bench concurrently with mining it is proposed that the total amount be provided.

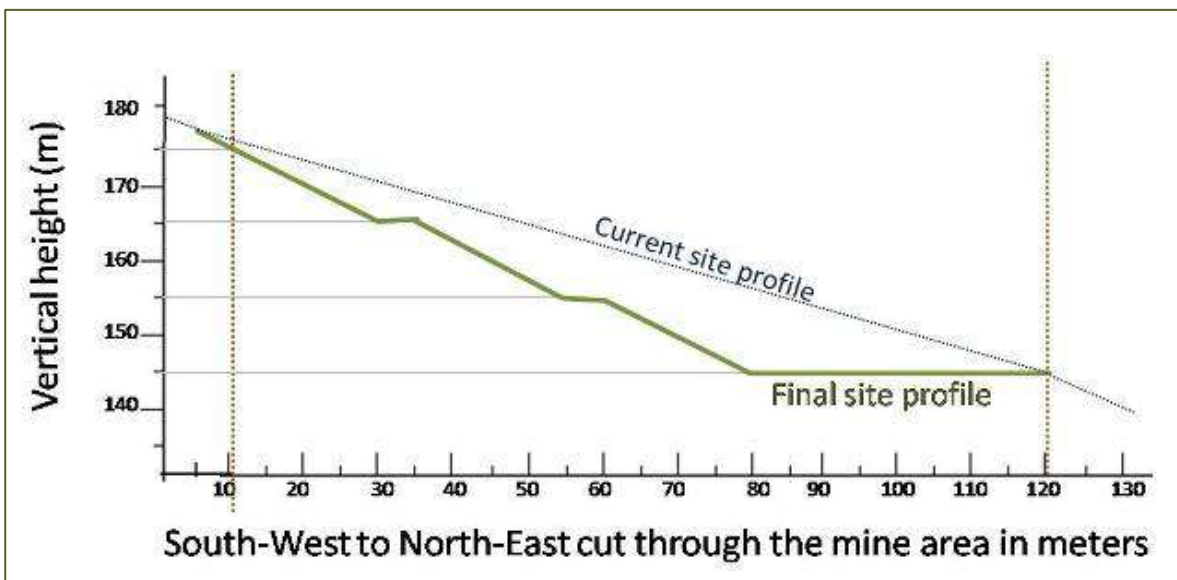


Figure 47: Final site profile at closure

Closure objections can be viewed under the heading "Closure Objections."

It is anticipated that the site will be completely rehabilitated but heavy rain events, veld fires or drought could affect the slope areas or vegetation cover moderately. It is anticipated that post closure maintenance be restricted to eradication of invasive vegetation, addressing erosion problems, reseedling of such affected areas and addressing face stability. In order to provide the necessary funds for this task the following guarantee needs to be secured:

Eradication of invasive vegetation = R1000 per annum x 3 years = **R3 000**

Addressing erosion/stability problems = R13 000 per annum x 3 years = **R40 000**

Re-vegetation and fertilizing of affected areas = R2000 per annum x 3 years = **R6 000**

Total = R49 000

Should the rehabilitated quarry require no maintenance during the aftercare period, the above post closure requirement can be waived otherwise the funds should remain in place for an additional two years.

UNDERTAKING: IMPACT ASSESSMENT

I, M. G. Godongwana, declare that the above information is in my opinion true, complete and correct. I undertake to implement the measures and provide the finances for rehabilitation at the quarry as described in all sections of this document. I understand that this undertaking is legally binding and that failure to give effect hereto will render me liable for prosecution in terms of Section 98 (b) and 99 (1)(g) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). I am also aware that the Regional Manager may, at any time but after consultation with me, make such changes to this plan, as he/she may deem necessary.

Signed on this day _____ of _____ 20_____

Signature of applicant

Performance assessments are required in terms of Regulation 55 of the MPRDA 29 of 2002 and the purpose is to ensure that the conditions of the letter of approval and the approved EMP are implemented during the lifecycle of the mine. Normally an assessment is required biannually. It is further proposed that independent assessments are done.

INSPECTIONS AND MONITORING

- Regular monitoring of all the environmental management parameters and implementation of measures will take place and the holder of the mining permit shall carry out certain components thereof to ensure that the provisions of this programme are adhered to.
- Ongoing and regular reporting on the progress of implementation of this programme will be done.
- Critical compliance areas will be identified with regard to the various impacts that the operations will have on the environment.
- Inspections and monitoring shall be carried out on a regular basis with specific emphasis on profiling of production faces, re-vegetation progress, die-off of established vegetation, re-establishing original surface flow pattern within the mine area, storm water control and dust and noise generation.

COMPLIANCE REPORTING / SUBMISSION OF INFORMATION

- Layout plans will be updated annually and updated copies will be submitted to the DMR
- Any environmental emergency/accident will be reported immediately to DMR and where applicable to DWAF/DEDEA.
- Should the assessment of environmental impacts in future be proved incorrect or should have impacts been unknown when the programme was compiled, then additional assessments shall be carried out and added as an amendment and where applicable a second opinion will be sought.
- All environmental hazards, unforeseen impacts identified pollution incidents or environmental failures will be reported to the DMR and other relevant Departments within 12 hours.
- An annual performance assessment will be compiled and submitted to the DMR in December for evaluation and acceptance.
- Six months ahead of extraction being completed a closure program will be compiled to ensure that rehabilitation will be completed as per the EMP and applicable environmental legislation.

- A performance assessment report and environmental risk report will be submitted once the conditions of the EMP and closure report were implemented.
- A final performance assessment report will be submitted at the end of the maintenance period to ensure that all potential impacts are covered, that procedures followed were in line with the conditions of the management plan and that rehabilitation was completed in accordance to the management plan.

The following site specific monitoring will be executed:

- An environmental monitoring checklist should be developed immediately after approval to facilitate a formal assessment process. It should be in line with environmental matters addressed in the EMP.
- All activities will be monitored on a fortnight basis until closure is granted and reporting structure will be defined at commencement of activities.
- The mining/rehabilitation activities will be regularly visited by the holder to ensure that:
 - Mining is taking place within approved boundaries and that mining related activities are not taking place outside the mine area.
 - Production faces are profiled and stabilized, provided with topsoil, vegetated and fertilized.
 - The minimum vegetation and topsoil are removed ahead of the mining face.
 - Topsoil is conserved and not showing signs of erosion or degradation.
 - That vegetation cover is adequate.
 - Re-vegetation process is successful and that alien vegetation is removed.
 - Storm water control measures are in place and are functional.
 - Storm water control structures are built and maintained according to specification.
 - Dumping of waste in unauthorized areas is not taking place.
 - The necessary precautionary measures for spills are followed and spills are effectively treated.
 - General waste control mechanism is in place and is handled correctly and effectively.
 - Base line dust levels were determined and dust control on the roads, at the plant and quarry is effective to limit air pollution.
 - Base line noise levels were determined and noise generation is within acceptable limits.
 - That the mine area is clean and tidy.
 - Haul roads have been demarcated.
 - Vehicles and equipment are maintained to prevent environmental impacts.
 - Should any remedial measures fail, it will be adapted to suit circumstances or alternatives would be found in conjunction with the officials in affected Departments or with private experts.
 - An environmental awareness programme will be introduced to make employees and contractors aware of EMP requirements.
 - Should serious environmental misconduct by workers occur, the specific activity would be stopped, remedied and penalties will be imposed.

QUARRY AREA

- Complete rehabilitation (vegetation established but not complete cover) of individual phases – within 18 months after mining ceased in a particular phase. Rehabilitation of final phase to be completed within 6 months after rehabilitation ceased.
- Profiling and preparation of seedbeds must be completed during autumn and winter.
- Seeding and infill planting must be done during spring, summer and early autumn.

PROCESS AREA

- Remove all infrastructures within 3 months after mining has ceased.
- Remove any waste and scrap metal within 4 months after rehabilitation was completed.
- Remove all stockpiles and concrete foundations within five months after mining ceased.
- Final cleanup of area within one six months after mining ceased.
- Complete rehabilitation of process area within six months after last of stockpiles has been removed.
- Maintain storm water control structures after process area was profiled and topsoil reintroduced

GENERAL

- Submit closure plan & risk assessment six months before mining operations are to cease.
- Submit performance assessment on annual basis.
- Aftercare/maintenance – Three years after rehabilitation was successfully completed.
- Quarterly eradication of alien vegetation until closure certificate is issued
- Light application of fertilizers in September and beginning of March for duration of mining, rehabilitation and aftercare phases.

CLOSURE OBJECTIVES

Closure objectives will be based on the following:

1. Identify the key objectives for mine closure to guide the project design, development and management of environmental objectives;
 2. Provide broad future land use objective(s) for the site; and
 3. Provide proposed closure cost.
-
- At closure all stockpiles, infrastructure and equipment will be removed. Other residue deposits, if any will be removed to a registered waste site.

- All waste will be removed to a registered waste facility and scrap metal will be sold off to a recycling company.
- Hydrocarbons, and contaminated soil, if any, will be safely removed from site.
- Production faces at the quarry will be profiled to 1:2 gradient, by cut & fill method with the top edge rounded off to create a flowing landscape.
- Post mining topography will as far as possible aligned with the natural topography of the area.
- Faces will be profiled in such a manner that soft lines are created and sharp corners are prevented in order to blend the quarry with surrounding landscape.
- Safe drainage of the area must be restored.
- The sides of the quarry will be provided with topsoil, ripped, fertilised and seeded to ensure that soils are stabilised with at least an 80% vegetation cover.
- The re-vegetated areas will display adequate grass cover and be functional as a semi-functional grazing unit. Additional indigenous creepers can be planted on the slope to help stabilize the soil and mask the topographical interference of the box-cut.
- The internal access road will be kept for future use.
- Platforms must be kept stable.
- No erosion may take place on the production faces.
- The soils of the slopes will be protected with contours and if needed, spill areas shall be protected with gabions or gabion mattresses.
- The mine will not become a dumping area.
- Alien vegetation will not degrade existing vegetation or the aesthetics of the area.
- Surface and ground water quality will be maintained.
- The aesthetics of the area must be largely reinstated.
- A sustainable land-use will be achieved within 2 years after rehabilitation has been completed.
- Abutting landowners will not be subjected to any post closure social impact.

CONTENTS OF CLOSURE PLAN

The closure application and submission of the following documents must be made to the DME 90 days before cessation of mining activities.

- An application for closure form,
 - A risk assessment,
 - A closure plan
 - Once the site is rehabilitated a final performance assessment will be done
-
- (a) a description of the closure objectives and how these relate to the mine operation and its environmental and social setting;
 - (b) a plan contemplated in Regulation 2(2), coordinated according to generally accepted standards, showing the land or area under closure;
 - (c) a summary of the regulatory requirements and conditions for closure negotiated and documented in the environmental management programme or plan;

- (d) a summary of the results of the environmental risk report and details of identified residual and latent impacts;
- (e) a summary of the results of progressive rehabilitation undertaken;
- (f) a description of the methods to decommission each mining component and the mitigation or management strategy proposed to avoid, minimize and manage residual or latent impacts;
- (g) details of any long-term management and maintenance expected;
- (h) details of financial provision for monitoring, maintenance and post closure management, if required;
- (i) a plan or sketch at an appropriate scale describing the final land use proposal and arrangements for the site;
- (j) a record of interested and affected persons consulted; and
- (k) technical appendices, if any.

The end-state of the mining area would be consulted with interested and affected parties in terms of Regulation 52(2)(g).

The holders of the permits will be liable for any environmental damage or degradation emanating from his operation, until a closure certificate is issued in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

AFTERCARE

It is anticipated that the following aftercare will be provided over two years:

- Vegetation cover – reseed bare areas or replant shrubs and trees in September to February
- Soil erosion – fill in rills & gullies, compact, provide with topsoil, fertilized – May to August
- Stability of production faces – Reshape affected areas, compact, provide with topsoil, fertilized - May to August. Seeding done in September to February.
- Eradication of alien vegetation – Quarterly.
- Maintenance of gabions and silt traps – after every rain event.

POST CLOSURE AESTHETIC ACCEPTABILITY

The post closure quarry area will resemble a box-cut in the hillside but the newly established profiles and vegetation cover will ensure that this negative impact is softened to a large extent. The affected landscape will be re-vegetated back as a minimum to grassland and therefore a semi-

functional grazing unit for wild and domestic animals. Over time, with a good soil cover and nutrient cycle in place, and as the grassland vegetation increases in maturity, natural re-vegetation will result in most of the original species establishing onsite and slowly, but not entirely eliminating reminders of the mining venture.

The original runoff patterns will not be impacted on and hill wash will be diverted through cut-off drains that must be maintained over the short and may be perceived as unnatural to the area but will prevent erosion of the process areas. Once soil stability is achieved, these berms can be removed.

However, if rehabilitation is not afforded adequate time, specialist input and finances the above assessment will change substantial and slumping production faces, die off of vegetation and major soil erosion could lead to a poor quality landscape with a very high negative aesthetic impact.

PUBLIC PARTICIPATION

The following persons/entities were identified as Interested and Affected Parties:

- Mr R P van Eek
- Mr P A Kay
- Mr G J Hawkins, who is currently the landowner, but in the process of selling the site to Superspot cc.
- Mr A Kotze, from Land Use Management at Buffalo City Municipality
- Ms N Mashologu, Chief Director: Rural Development and Land Reform, East London.

All of the above parties were consulted and a letter with back ground information regarding the project was forwarded to them on 23 April 2012. To date no response has been received and no issues raised. A full detailed report and outcome of consultation can be viewed in Appendix B of this document.

ENVIRONMENTAL AWARENESS PLAN

The goal of an environmental awareness plan is to prescribe the manner in which the applicant intends to inform all of his employees and contractors of all the possible environmental risks resulting from their particular line/function of work within the structures of the organization. This plan will also prescribe the manner in which the identified risks will be dealt with to avoid pollution and environmental degradation.

In general the objectives are the following:

1. Environmental Management Introduction to all personnel: General environmental information session to ensure that employees at each relevant function and level receive environmental information and are aware of the Mine's environmental management objectives.

It is also the responsibility of the applicant/management to conduct basic training with less literate employees describing the listed environmental impacts and the mitigation measures to be followed prior to commencing with mining in a more practical manner. The applicant may chose to employ an independent consultant to conduct such training. Such training is best done onsite as it is more useful and visual. As a minimum the Basic Environmental Awareness Plan must address the following:

- The need for training
- General discussion on what is the environment
- Why must the environment be protected
- The different components of mining, applicable to this application
- Types of environmental impacts
- Mitigation measures and Basic Rules to comply with
- Fines and Penalties
- Questions and Answers

2. Job specific training: Employees whose function of work can cause significant environmental impacts must be trained, educated and afforded the experience to ensure that their tasks are performed to the best of their ability to minimize environmental degradation on the mine site.

The spinoff of Environmental training will produce a group of people being equipped and enriched with knowledge to implement the main principles that was taught to them, outside of the workplace as well. It will enable them to put into practice their knowledge at home or other work places, should they one day leave the quarry or in the event of closing down.

In order to present the general environmental information session Mine Management must determine the Mine's environmental management objectives as established in the Environmental Management Programme (EMP). Since this will be a new mining concern, objections for the construction, operational and decommissioning phases must be summarized and presented to the trainees.

The Management is responsible to provide training annually (or more regularly if the need raise) to employees and contractors on:

- ☑ The importance of compliance with the objectives of the EMP and procedures to achieve the objectives of the EMP.
- ☑ Identifying the significant environmental impacts: actual or potential impacts and how employees and contractors work activities might influence the impacts.
- ☑ Benefits for improved personal performance with regards to environmental awareness.
- ☑ Their roles and responsibilities in achieving compliance with the objectives of the EMP and procedures to achieve the objectives of the EMP, including emergency preparedness and response requirements.
- ☑ The potential consequences of departure from specified operating procedures.

In terms of job specific training, Management must identify relevant personnel and training courses for employees and contractors performing tasks, which can cause significant environmental impacts. They must become competent on the basis of appropriate education, training and/or experience. Superspot 2 cc might possibly have the following personnel structure, which will require job specific environmental training:

1. Management
2. Admin personnel
3. Operating personnel:
 - a. Truck drivers
 - b. Manual labour personnel

As part of environmental awareness, Management must on a continuous basis review the objectives of the EMP and the practicality thereof, and environmental legal requirements (potential liabilities). Should the objectives of the EMP be changed the Department of Mineral Resources (DMR) must be notified and approval granted. The change in objectives must be conveyed to employees and contractors to ensure that they understand and subsequently outwork the changes and improve the state of the environment on the mining area.

Comprehension training must include:

- Emergency preparedness and response, including incident report
- Slope stability and erosion control
- Storm water management
- Dust control
- Noise control
- Road safety precautions
- Rehabilitation and substrate preparation
- Alien vegetation identification and control
- Spill management
- Waste management

After training needs have been identified, it is the responsibility of Management to ensure that employees and contractors attend the relevant identified training and attendance must be documented. Management must decide on the appropriate time to conduct environmental training.

As an incentive to motivate employees, progress on compliance with the training programme can be recorded and evaluated to nominate and elect the best candidate who has improved personal performance with regards to environmental awareness. Such an employee may be rewarded to the discretion of the applicant. This can be done through the following method:

- By Management through task observation;
- During internal and external audits, when the effectiveness of the EMP is evaluated;
- Own initiatives taken by employees to improve on the environment.

It is important that the Environmental Awareness Plan be applicable to the specific mining operation and the level of understanding of the employee. Open communication between the employees and the manager must be established and in the event of an environment emergency, the applicant must have process steps in place to ensure that the situation is contained and the correct procedure is followed to ensure that pollution and degradation does not occur.

Mitigation measures listed in this document must be used as a guideline to conduct such training and to establish the rules for operation. After such training, each employee may receive a certificate of completing the training. The applicant may also have a check list available onsite to ensure that employees are constantly aware of the mitigation measures.

PERSONNEL

The managing director of the applicant, Mr. M.G. Godongwana, has worked for the Department of Road Works for over 10 years as a sub-contractor on various road upgrades which involved the development and rehabilitation of gravel quarries. He has proven to be an expert production operator. Mr. M.G. Godongwana himself dispose of at least 24 years of experience operating heavy equipment, mostly associated with road construction and civil engineering projects and would be able to provide the necessary supervision and guidance to the excavator operator, that will develop the proposed quarry. Mr. M.G. Godongwana has adequate experience in being mine manager and therefore health & safety requirements and will therefore be able to ensure that the concern is developed in accordance with the guidelines provided by the Mine Health & Safety Act.

Mr. Hawkins dispose of tertiary education in building construction, machine construction and applied mechanics which would enable him to provide overarching supervision over the proposed quarry development and to guidance where necessary. As an employee he has been exposed to the quarry environment for at least 12 years and since then, as owner of plant hire and earthmoving businesses, he dispose of 15 years of managing earthmoving, mining, construction and demolition projects, which causes him to be fully qualified to provide guidance on the development of the proposed gravel quarry. He also dispose of 15 years of experience in operating/servicing of heavy equipment and is therefore fully qualified to ensure that plant is applied and maintained to a standard to optimize production and minimize safety risks.

Its machine operators are well trained and have extended earthmoving experience gained during general numerous construction and road construction projects. Operators all received in-house as well as external training and dispose of certificates to operate individual equipment.

EQUIPMENT

Technical competency will be provided by Power Plant Hire (Pty) Ltd. The company has been involved in conducting mining operations for and on behalf of other parties since 1990. After the BEE transformation of the company in 2003 it was the successful mining operators of amongst other Dr Cedric Tutt's gravel mine on his Protea Farm in East London as from 2005 to 2008 and its own gravel mine on the farm 'Lavender' since 2009.

Considering plant hire and earthmoving/demolition its core business, the concerns owns all the

necessary earthmoving equipment and necessary human resources to develop the gravel quarry in an acceptable manner.

Technical Equipment that will be made available will include:

- A fleet of trucks, machinery and equipment
- Liebherr L524 Front End Loader
- Liebherr R924 Excavator

The applicant dispose of a fully equipped workshop managed by qualified auto-electricians and diesel mechanics that will ensure that equipment is maintained to an acceptable standard that would limit softy risks for operators.

SURVEYING

The applicant has access to its own land surveyor, Mr. T. Flaming (S 0287) that disposes of extended experience and will be able to assist the applicant to remain within its mine boundaries and any other survey work to be completed.

FINANCING

An amount of R70 000 will be made available to cover initial rehabilitation costs. As pointed out the applicant is a well established business and provision for all equipment required for development has been made available as well as rehabilitation of the quarry concern, which will be sufficient to rehabilitate the already disturbed mining site.

Considering the profitability of the project the Department of Mineral Resources would therefore not be at risk in terms of outstanding rehabilitation, provided that the proposed rehabilitation and financial guarantee schedule is followed. The implementation of the latter will require additional funding and the necessary provisions will be made for that on development of ensuing phases.

REHABILITATION

It is important that the applicant disposes of adequate environmental knowledge to ensure that an environmentally friendly concern is established that complies with current legislation and poses limited post closure impacts. The proposed concern will require good housekeeping, which will be within reach of the applicant's abilities since a mine manager with adequate experience will be appointed.

The mine manager, Mr Hawkins, have over the years obtained vast experience in the mining industry. He has been comprehensively involved in the rehabilitation of disturbed mine areas which includes the stripping of topsoil, stockpiling, replacing the topsoil and reseeding the areas to have a full grass cover. Thus, this experience causes the applicant to understand rehabilitation and specifically slope stabilization, which will be important for this application.

The applicant will therefore be capable of handling topsoil and re-establishing vegetation on the disturbed areas to a functional grass unit without causing degradation of the land through erosion and alien infestation.

In conclusion the environmental impacts associated with the proposed mining concern is: erosion on slopes, loss of vegetation cover, alien infestation, loss of soil fertility, limited silt transport, and some social impact in terms of hauling material on public roads. Through the conditions of this EMP, the applicant will ensure that the important environmental considerations applicable to this particular mining site are executed.

Since the concern will have a good product turnover, the rehabilitation fund can be managed properly and the applicant will be able to effect the amendment of the guarantee as required by the MPRDA, which in turn will reduce the environmental risk.

The applicant will also submit an annual performance assessment reports reflecting on his ability to manage the environment. Should it be required an ECO will be appointed to oversee the project

UNDERTAKING

I, M. G. Godongwana, on behalf of Superspot 2 cc, the undersigned have studied and understand the contents of this document in its entirety and hereby duly undertake to adhere to the conditions as set out therein including the conditions of approval as stipulated by the Regional Manager.

Signed in **PORT ELIZABETH** on **13 JULY** 2012.



.....

Signature of applicant

Agency declaration: This document was compiled on behalf of the applicant by Stellenryck Environmental Solutions

APPROVAL

Approved in terms of Section 39(4) of the Mineral and Petroleum Resources Development Act, 2002 (Act 29 of 2002)

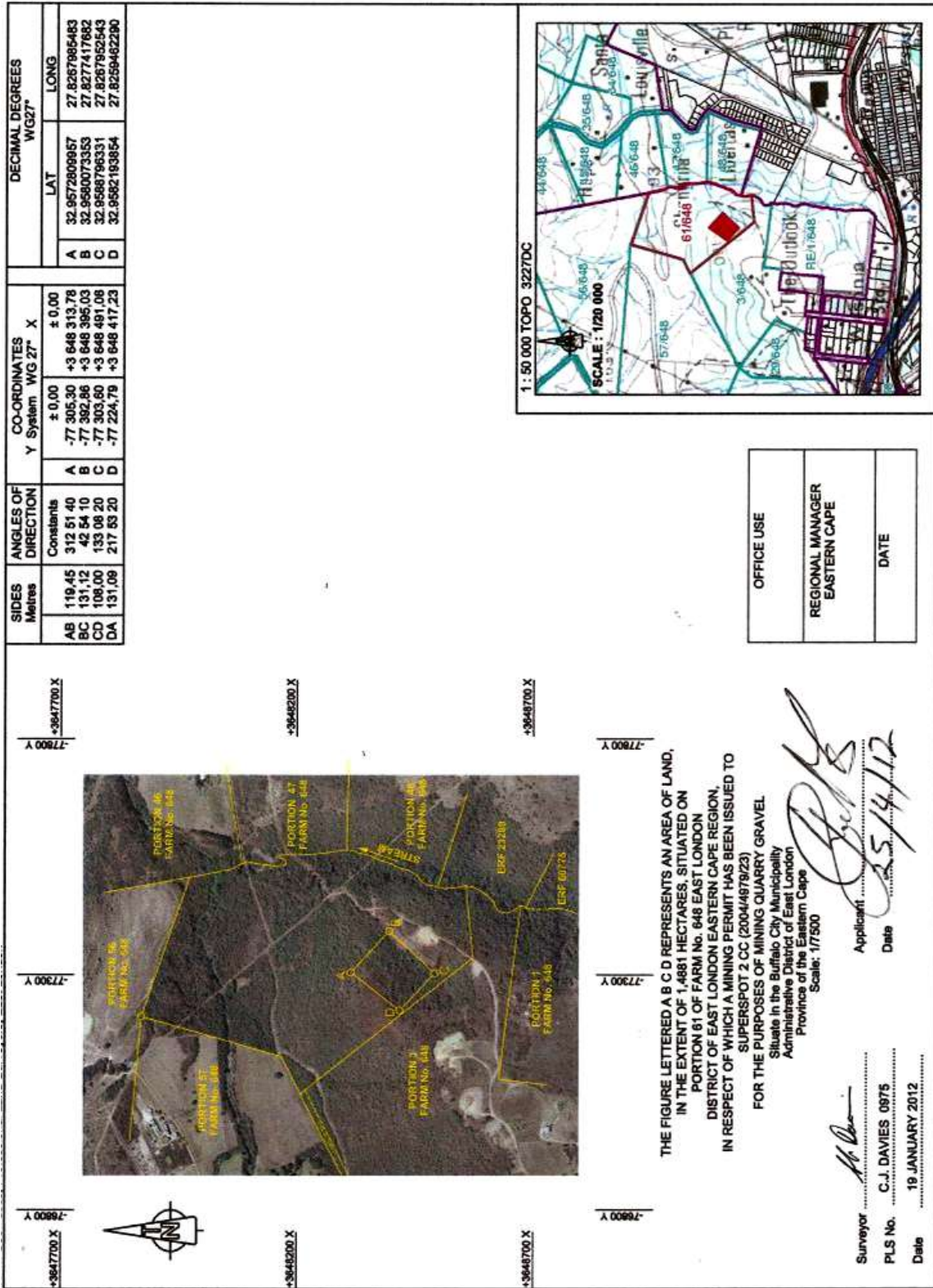
Signed at Port Elizabeth on this.....day of.....2012

.....

REGIONAL MANAGER

EASTERN CAPE

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PUBLIC PARTICIPATION PROCESS

Name of Applicant : Superspot 2 CC

Application number : EC 30/5/1/3/2/10032 MP

1. The following persons/entities were identified through phase 1 Deed Search as Interested and Affected Parties:

- Mr. R.P. van Eek
- Mr. P.A. Kay
- Mr. G.J. Hawkins
- Mr. A. Kotze, Land Use Management, Buffalo City Municipality
- Ms. N. Mashologu, Chief Director: Rural Development & Land Reform, East London
- Mr. M. Songqishe, District Roads Engineer, Dept. Roads & Public Works, East London

2. Consultation:



PUBLIC PARTICIPATION: PERMIT APPLICATION FOR MINING WEATHERED DOLERITE ON FARM 648, EAST LONDON



APPLICANT:

Superspot 2 CC
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BEACON BAY
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June 2012

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Fax: 041-367 2049
E-mail: stellenryck@telkomsa.net

Interested & Affected Party

Date: 23 April 2012

MINING PERMIT APPLICATION FOR WEATHERED DOLERITE ON PORTION 61 (A PORTION OF PORTION 3) OF FARM 648, EAST LONDON

You are hereby informed that Superspot 2 CC has appointed Stellenryck Environmental Solutions CC (SES) to conduct the Public Participation Process for the above mentioned mining venture.

In terms of section 16(4)(b) of the Minerals & Petroleum Resource Development Act 28 of 2002, an applicant for a mining permit must consult with Interested and Affected Parties (I&APs) regarding any proposed mining activity and submit the result of the said consultation to the Department of Mineral Resources (DMR).

The mining permit application was submitted to the DMR and the application was accepted by the DMR. Acceptance of the application must not be construed as the approval of the project, since the process of approval/refusal that has commenced on the date of acceptance, must still run its course.

This communication therefore serves to inform you about the intention of Superspot 2 CC to mine on the said property and thus as a landowner, you have been identified as an interested and affected party (I&AP) in the project and the purpose of this letter is therefore to:

- Inform you of the locality of the proposed mining area.
- Give you an opportunity to raise any comments you might have in respect of the proposed mining activities detailed in the attached annexure.
- Incorporate any valid concerns in the final Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) to be submitted to the DMR in terms of section 39(1) of the said Act. In terms of section 39(4) of the Act the EMP must be approved by the DMR prior to the commencement of any mining or related activities.

Your involvement

This consultation process is important as it raises your awareness on the nature of the operation and grants you the opportunity to raise any comments you might have on the mining venture. You are therefore requested to submit your comments/observations/concerns in writing by means of completing, as a minimum, the accompanying comment and registration sheet. Should any observation/concern be identified as definite and significant environmental/social impacts, the relevant matter will be investigated, assessed and where necessary, mitigation measures will be developed and captured in the Environmental Impact Assessment (EIA) & Management Plan (EMP) to address any identified impact satisfactorily. In order to ensure that your comments are

captured in the response report to be submitted to the Department of Mineral Resources, your comments on the application as well as any provisional environmental comments are required in writing no later than 22 June 2012.

Way Forward

1. The outcome of this consultation process will be submitted to the DMR for decision making.
2. Thereafter, an EIA & EMP will be submitted to the DMR and other affected Government Departments for evaluation and decision making.
3. If the application is found acceptable by the DMR, a financial guarantee that will cover rehabilitation costs will be submitted to cover costs related to disturbances that may be caused by invasive mining activities.
4. If the DMR's decision making process results in approval of the mining venture, a Mining Permit will be granted and the EMP will be approved. You will be notified of when the Mining Permit is issued.
5. Mining activities will then be conducted in accordance with the approved mining work programme and EMP.
6. Annual environmental performance assessments will be conducted and the outcome submitted to the DMR for evaluation and any appropriate decision making.
7. On completion of mining activities, an application for closure and final environmental performance assessment, which will include your comments on the status of the mining areas, will be lodged with the DMR for decision making and the issuing of a closure certificate.

Please refer to the attached information regarding the applicant and mining areas of the proposed project. Please note it is not intended to provide all details on the project or to replace the EIA/EMP. Should you wish to discuss any aspect of the application please do not hesitate to contact us.

Should you wish the applicant to consult any other party during the EMP process, please provide *SES* with the relevant contact details.

Yours sincerely



J. A. van As
STELLENRYCK

Member: J. A. van As: B.Sc (Botany & Zoology), B.Sc (Hons) (Eco-Physiology), M.Sc (Plant Physiology)

**PUBLIC PARTICIPATION REPLY FORM FOR MINING PERMIT APPLICATION
ON PORTION 61 (A PORTION OF PORTION 3) OF FARMS 648, EAST LONDON**

Please return by fax or registered post to:

Fax: 041-3672049

J. A. van As
Stellenryck Environmental Solutions

Postal address:

Stellenryck Environmental Solutions
4 Josephine Avenue
Lorraine
6070

Contact details of Interested & Affected Party

Name:

Property/Organization

Postal address

Telephone Fax No.....

Mobile E-mail.....

Please list your comments on the project (Should you require more space use additional page):

1.....

2.....

3.....

4.....

5.....

or

I have no comments on the proposed Superspot 2 CC mining venture.

I, _____ confirm that I have received the
Public Consultation Notice from Superspot 2 CC regarding weathered dolerite mining on a
portion of farm 648, East London.

Signature

ID Number

Date

Name of any other person whom you think should be consulted

Name and Surname.....

Farm Name and Portion.....

Telephone.....**Fax**.....

Address.....

PARTICULARS OF APPLICANT

Superspot 2 CC
P.O. Box 2417
BEACON BAY
5205

Reg no: 2004/049719/23

Tel: 043 -745 1408

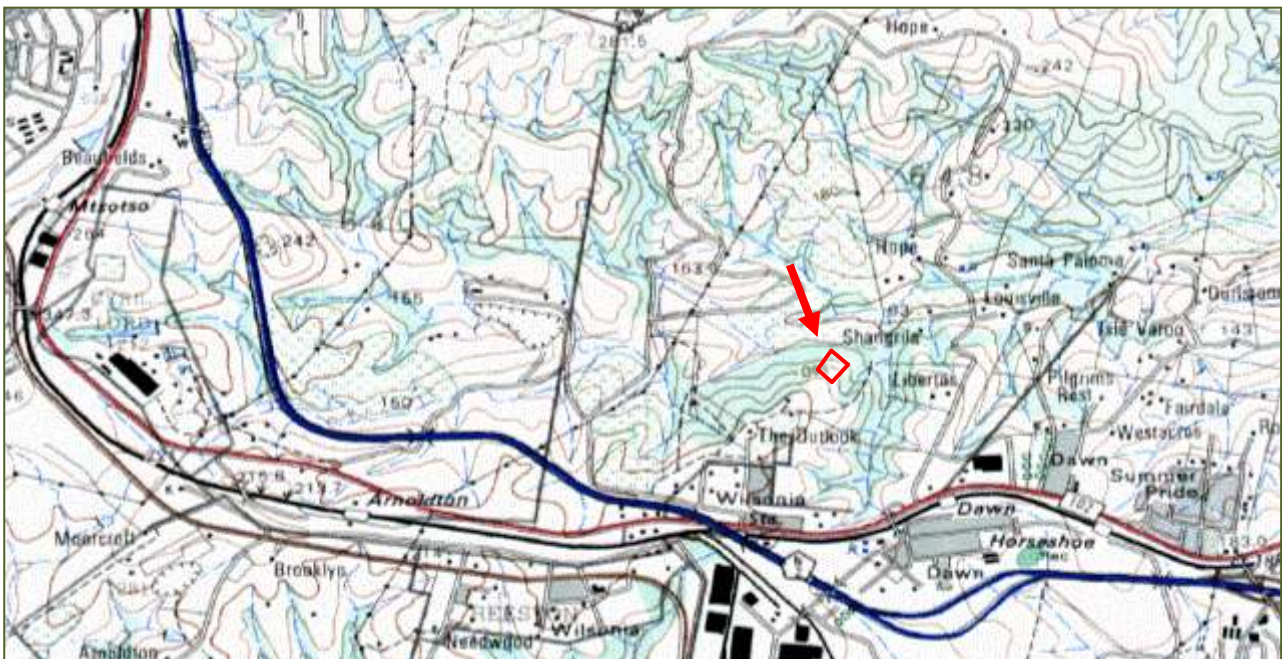
Fax: 043- 745 1233

LANDOWNER

Mr. G.J. Hawkins

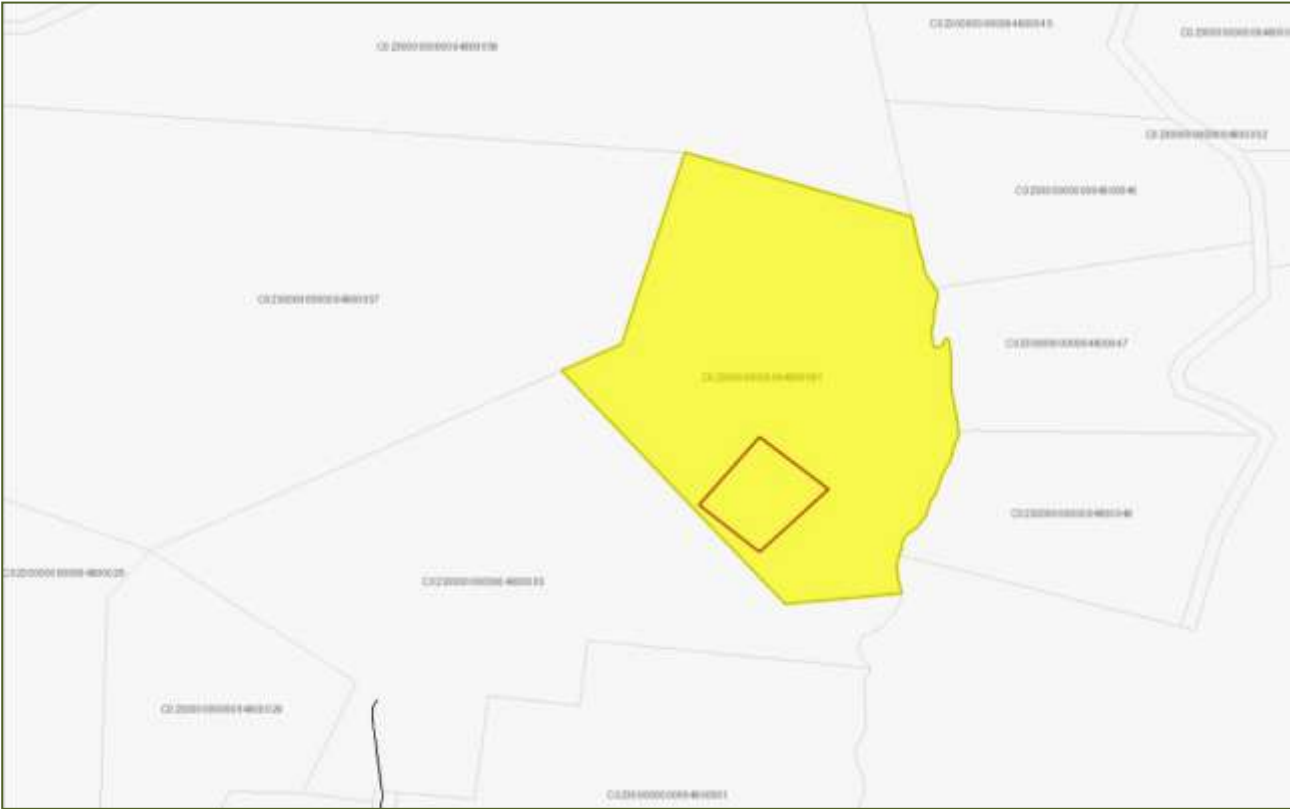
PLAN SHOWING THE PROPERTY AND MINING AREA CONCERNED

The study site is situated approximately 14 km west of East London town centre and 46 km east of King Williams Town. Eureka suburb is approximately 600m south-west from the site, whilst Dawn residential area is located approximately 950m south-east. Small industrial site is located 750m south-east. Property owner's residence is located 470m south-west whilst the nearest abutting properties are located 500m and 600m to the north-east and north-west respectively. The R102 and gravel access road, connecting the proposed mining site with East London and King Williams Town, are located respectively 900m and 530m to the south and east respectively.

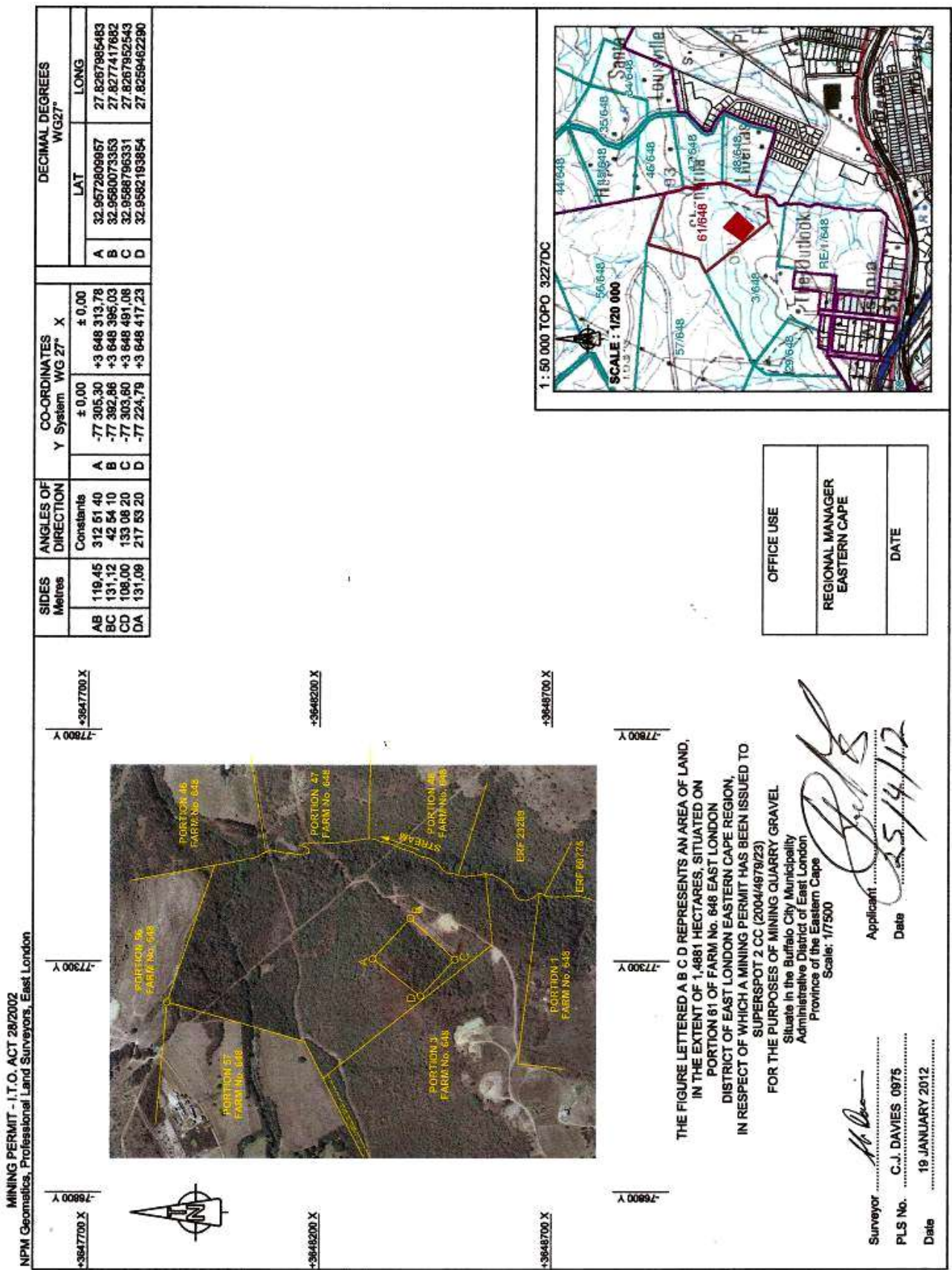


Access to the site and various farms is via a gravel road leading from the R102 (Voortrekker Street) to the south. The site is situated in a rural area surrounded by farms with residential and industrial areas outside a 500m radius. There are no overheads (e.g. a power line, telephone line servitude, etc) in the proposed quarry area.

Mining area in relation to property boundaries – All abutting properties owned by applicant save for 57/648



Mine Plan



Member: J.A. van As: B.Sc (Botany & Zoology), B.Sc Hons (Eco-Physiology), M.Sc (Plant Physiology)

The consultation letter was e-mailed to the following entities:

From: Stellenryck [mailto:stellenryck@telkomsa.net]
Sent: 11 June 2012 09:38 AM
To: Albie Kotze
Subject: Mining Permit Application: Superspot 2CC

Dear Mr. Kotzé,

Please see the attached document for your perusal and response.

Kind regards

Vanessa van As

pp: J.A. van As
Stellenryck Environmental Solutions
4 Josephine Ave
Lorraine
6070
Tel/Fax: 041 - 367 2049
Cell: 082 414 0464
E-mail: stellenryck@telkomsa.net

Stellenryck

From: "Stellenryck" <stellenryck@telkomsa.net>
To: <mbulelo.songqishe@dpw.ecape.gov.za>
Sent: 11 June 2012 09:42 AM
Attach: PPP1.pdf
Subject: Mining Permit Application: Superspot 2CC
Dear Mr. Songqishe,

Please see the attached document for your perusal and response.

Kind regards

Vanessa van As

pp: J.A. van As
Stellenryck Environmental Solutions
4 Josephine Ave
Lorraine
6070
Tel/Fax: 041 - 367 2049
Cell: 082 414 0464
E-mail: stellenryck@telkomsa.net

Stellenryck

From: "Stellenryck" <stellenryck@telkomsa.net>
To: <ntasefni@ruraldevelopment.gov.za>
Sent: 11 June 2012 09:47 AM
Attach: PPP1.pdf
Subject: Mining Permit Application: Superspot 2CC

Dear Ms. Tasefni / Mashologu,

Please see the attached document for your perusal and response.

Kind regards

Vanessa van As

pp: J.A. van As
Stellenryck Environmental Solutions
4 Josephine Ave
Lorraine
6070
Tel/Fax: 041 - 367 2049
Cell: 082 414 0464
E-mail: stellenryck@telkomsa.net

E-mails read:

Page 1 of 1

Stellenryck

From: "Albie Kotze" <AlbieK@buffalocity.gov.za>
To: "Kamva Qwede" <KamvaQ@buffalocity.gov.za>
Cc: <stellenryck@telkomsa.net>
Sent: 11 June 2012 09:39 AM
Attach: PPP1.pdf
Subject: FW: Mining Permit Application: Superspot 2CC

From: Stellenryck [mailto:stellenryck@telkomsa.net]
Sent: 11 June 2012 09:38 AM
To: Albie Kotze
Subject: Mining Permit Application: Superspot 2CC

Dear Mr. Kotzé,


Please see the attached document for your perusal and response.

Kind regards

Vanessa van As

pp: J.A. van As
Stellenryck Environmental Solutions
4 Josephine Ave
Lorraine
6070
Tel/Fax: 041 - 367 2049
Cell: 082 414 0464
E-mail: stellenryck@telkomsa.net

List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
 (With an insurance option/met 'n versekeringsopsie)

Hawkins PPP 
 Post Office

Full tracking and tracing/Volledige volg en spoor

Name and address of sender *Stellenryck Environmental Solutions cc*
 Naam en adres van afsender
 CC No.: 2008/144543/23
 4 Josephine Avenue
 Lorraine 6070
 Tel./Fax: 041 367 2049

Enquiries/Navrae
 Toll-free number
 Tolvry nommer
0800 111 502

No	Name and address of addressee Naam en adres van geadresseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor-Klientafskrif
1	Mr. A. Kotze, Land Use Management, Buffalo City Municipality P.O. Box 134 East London 5200					REGISTERED LETTER (with a domestic insurance option) Skemaal 0800 111 502 www.ppp.co.za RD 734 820 216 ZA CUSTOMER COPY 301029H
2	Ms. N. Masholou Chief Director: Rural Development P.O. Box 1958 East London 5200					REGISTERED LETTER (with a domestic insurance option) Skemaal 0800 111 502 www.ppp.co.za RD 561 975 075 ZA CUSTOMER COPY 301029H
3	Mr. M. Songqishe District Roads Engineer Dept. Public Works P/Bag x 13004, Cambridge 5247					REGISTERED LETTER (with a domestic insurance option) Skemaal 0800 111 502 www.ppp.co.za RD 734 820 220 ZA CUSTOMER COPY 301029H

Number of letters posted **3** Total Totaal **R R R R**
 Getal briewe gepos

Signature of client *[Signature]*
 Handtekening van klient

Signature of accepting officer *[Signature]*
 Handtekening van aanneembeampte

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R2 000,00 is available and applies to domestic registered letters only.
 Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.



- a) The owner of Superspot 2 CC personally consulted with the abutting landowners, Mr. van Eek and Mr. Kay who provided the following written consent:

ROBERT PAUL VAN EEK
7 Bella Vista Avenue.
Cambridge
East London
0787317771

TO WHOM IT MAY CONCERN;

I ROBERT PAUL VAN EEK (ID No. 4506205013081)
THE SOLE OWNER OF FARM 648/57 HEREBY DECLARE THAT I HAVE NO
OBJECTION WHATSOEVER TO THE MINING PERMIT APPLICATION
SUBMITTED BY SUPERSPOT 2 CC. ON FARM NO 648/61 WHICH IS ADJACENT
TO MY FARM .

SIGNED AT EAST LONDON ON THE _____ DAY OF _____ 2012

SIGNED RPo Eek ROBERT PAUL VAN EEK

WITNESS 1) [Signature]

WITNESS 2) [Signature]

From : SUPERSPOT 2 CC.

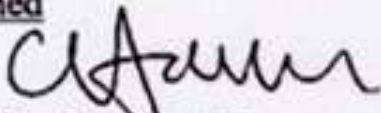
Address : P.O.BOX 2417
Beacon Bay 5205
East London
Phone 0826512649

TO WHOM IT MAY CONCERN


We Griffin John Hawkins and Patrick Anthony Kay , sole shareholders of SUPERSPOT 2 CC the owner of Portion 48 of Farm 648 hereby confirm that we have no objection to the application (REF C30/5/1/3/2/10032MP)for a mining permit on Portion 61 of Farm no 648 . which is adjacent to our property .

Signed at East London on the 10th Day of April 2012 .

Signed



Griffin John Hawkins



Patrick Anthony Kay

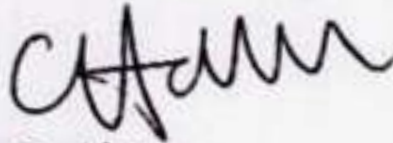
From : Griffin John Hawkins
I.D . No 02/4804195119087
Address : Portion 3 of Farm 648
Eureka
East London
Phone 0826512649

TO WHOM IT MAY CONCERN

I hereby confirm that I am the sole owner of Portion 3 of Farm no. 648 Eureka and that I have no objection to the application by SUPERSPOT 2 CC for a mining permit on Portion 61 of Farm no 648 .

Signed at East London on the 10th Day of April 2012 .

Signed



Griffin John Hawkins

Up to date no further responses were received from I&APs
