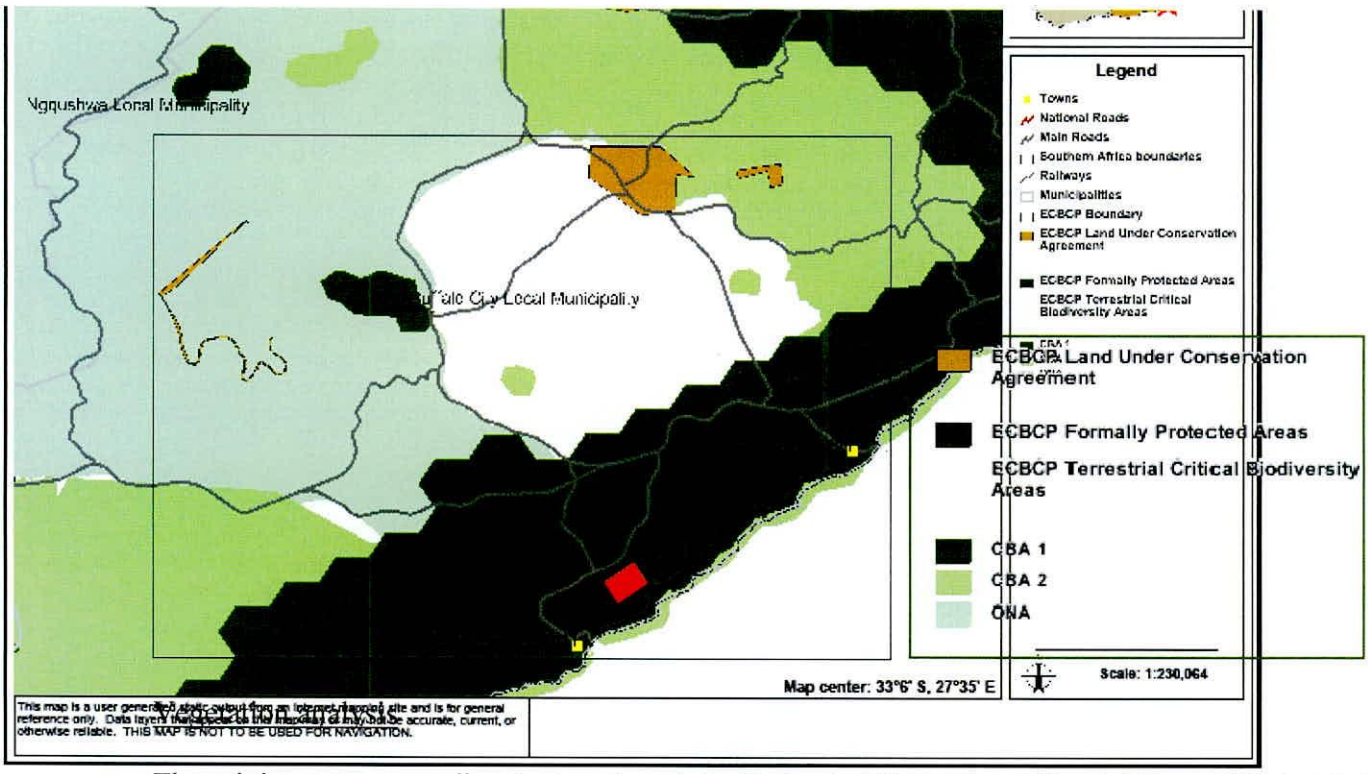
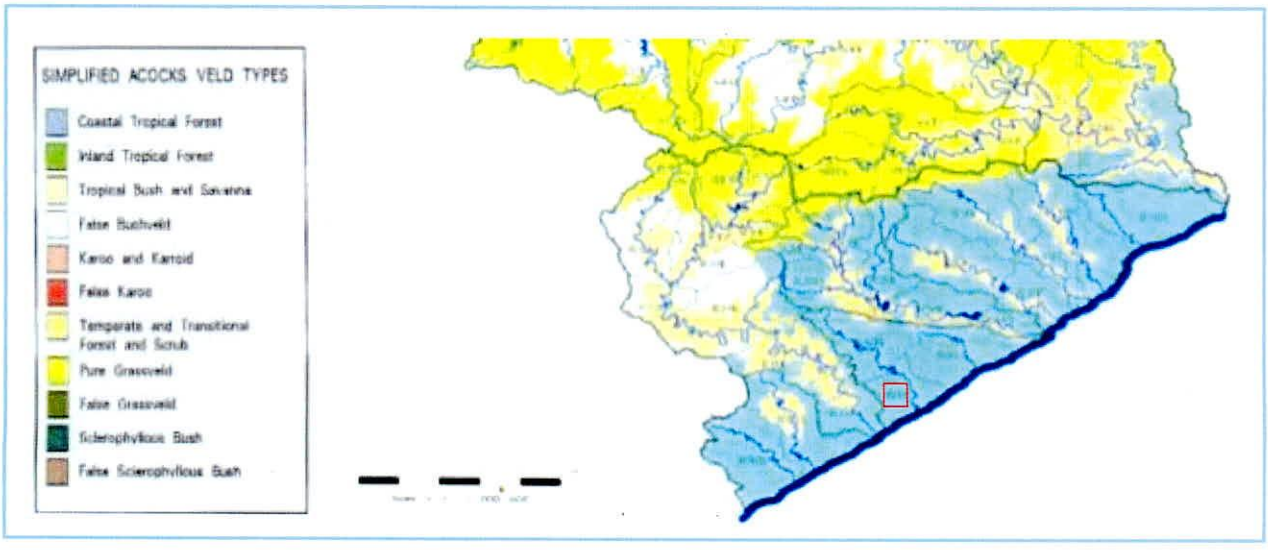


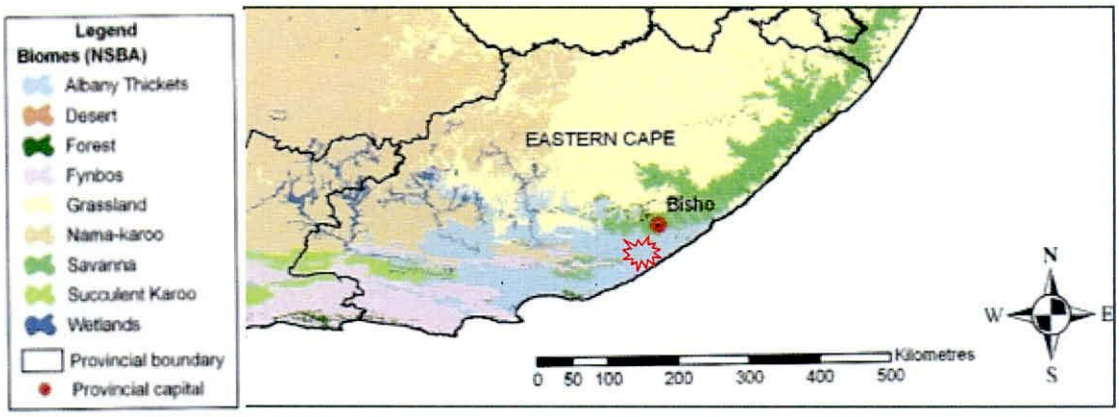
The mining area, according to Acocks originally hosted Transitional Coastal Forest (1), but today the veld type inland of the coastal forest belt is grassland of which extensive tracts within the larger area were turned into pastures and arable land. In addition, historic disturbances caused extensive invasion by alien tree species, a characteristic of the greater area.

Acocks

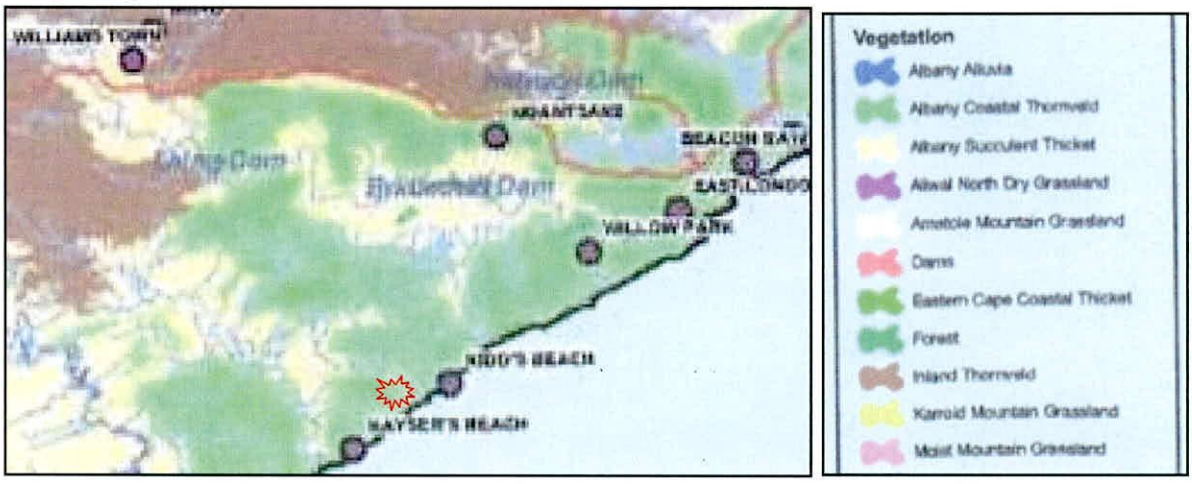


According to the STEP Programme, the mine area is located within the Albany Thicket biome and Albany centre of endemism. The study area is represented in a broad band of vegetation parallel to the coast consisting of a grassland /savanna mosaic, which comprises a large part of the District. The savanna biome comprises various open thorn tree savanna vegetation types, which are characterized by a grassy ground layer and a distinct upper layer of woody plants. The dominant savanna types in the study area are Albany Coastal Thicket. Within the Amatola District intersecting all these ecosystems perpendicularly to the coast are incised valleys that are dominated by thicket vegetation. Closer analysis reveals that the grasslands are situated within the Albany Coastal Thornveld, but very little has

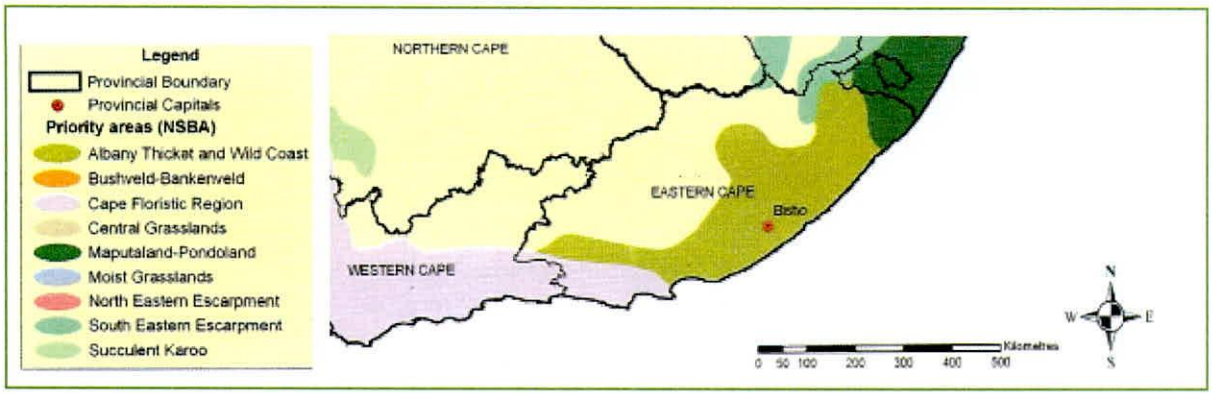
remained of the shrubs and trees as mentioned earlier and mostly grass species with herbs have remained. This is most probably the result of farming practices and pastoralism.



Step Programme



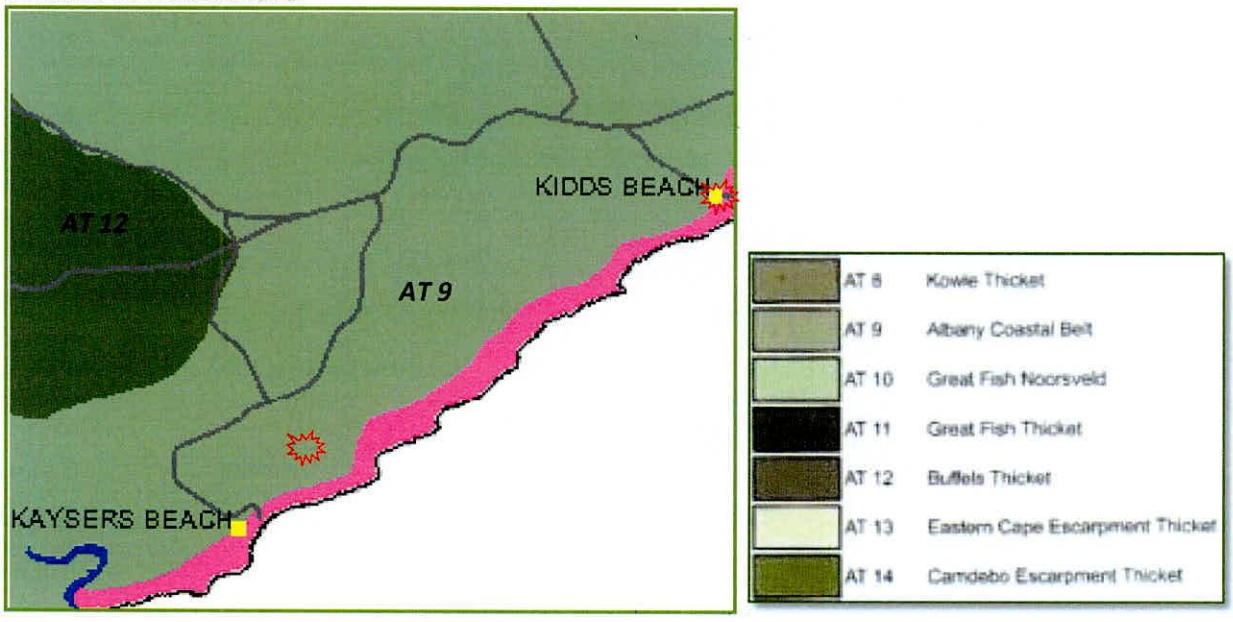
In terms of the National Biodiversity Plan, the study area forms part of the Albany Thicket priority area, but no definite strategy is in place for conservation on private land in this particular area. However, approximately 17% of Eastern Cape Coastal Thornveld is conserved in the Amatola District, which exceeds the recommendations for this veld type.



On the property concerned only a small portion of the grassland was disturbed and mining a small portion thereof will not detrimentally affect the functionality of the grassland. It is however, important that the grassland be reinstated to ensure future functionality of the corridor.

In terms of the latest vegetation classification system, the study area hosts Albany Coastal Belt Vegetation. Details on this veld type are provided below. This particular vegetation type has a 'least threatened' status, but is poorly protected. The decision to protect at least 50% of it in on the farm, is therefore in line with conservation objectives.

Musina & Rutherford



AT 9 Albany Coastal Belt

Name of vegetation type	Albany Coastal Belt
Code as used in the Book - contains space	AT9
Conservation Target (percent of area) from NSBA	19%
Protected (percent of area) from NSBA	1% (+4.9%)
Remaining (percent of area) from NSBA	80.9%
Description of conservation status from NSBA	Least threatened
Description of the Protection Status from NSBA	Poorly protected
Area (sqkm) of the full extent of the Vegetation Type	3269.15
Name of the Biome	Albany Thicket Biome
Name of Group (only differs from Bioregion in Fynbos)	Albany Thicket
Name of Bioregion (only differs from Group in Fynbos)	Albany Thicket

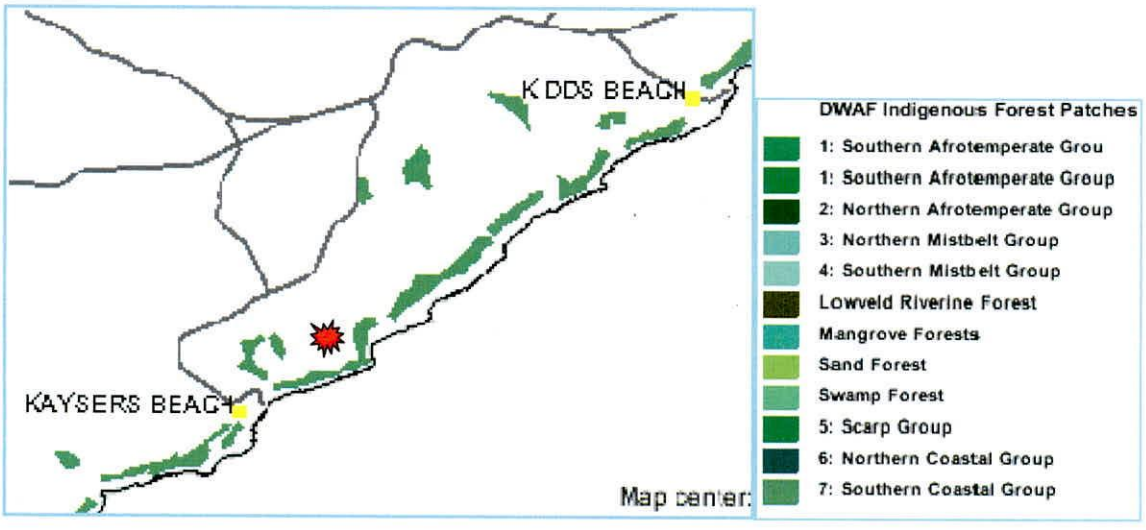
Distribution

Eastern Cape Province: Within 15 km (sometimes up to 30 km) of the Indian Ocean coastline, from Kei Mouth to the Sundays River, interrupted by many valleys. Altitude 10–400m.

Conservation

Least threatened. Target 19%. Only 1% of this vegetation unit is protected in 20 local-authority and provincial nature reserves as well as in the Greater Addo Elephant National Park (including Alexandria Coast Reserve West) as well as in number of private conservation areas. About 12% of the Albany Coastal Belt has recently been altered by cultivation, 1% by plantation forestry and 4% by urbanisation. According to land-cover data, at least 7% consists of degraded vegetation. It is difficult, however, to determine the proportion of the vegetation that is in a secondary state, since land-cover data do not distinguish between primary and secondary vegetation. Erosion is very low to moderate.

The proposed mining site is also not located in close proximity to any indigenous forest area under protection of the Department of Water Affairs & Forestry and therefore poses no threat to these isolated forest patches.

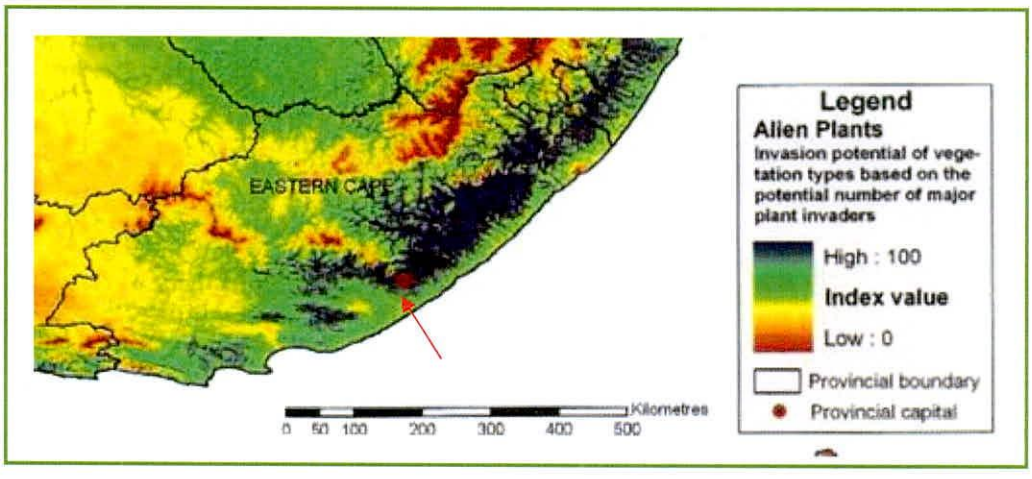


The primary dune constitutes a definite vocal point in the landscape and therefore the proposed mining area is rated as a site of moderate visual character and therefore contributes to the aesthetics of the area, especially considering the percentage of transformed land on surrounding arms and extensive alien tree

stands on some properties. In terms of the Amatola State of the Environment Report the land hosts no species of special concern. The following grass species occur within the study area:

Themeda, Digitaria, Hyparrhenia Cymbopogon, Tristachya, Heteropogon, Panicum, Cloris, Eragrostis and Cynodon species.

Considering the status of the study area and the immediate surrounds, the impact on indigenous flora is rated of moderate significance without mitigation measures in place. In order to achieve effective re-vegetation of the mine area, a heterogeneous grass cover needs to be established. According to land classification, the invasion potential of the land concerned is rated medium-high and disturbed land should be treated with utmost care. To achieve a proper surface cover, it is essential that soils are upgraded to ensure that grass species are able to out-compete the alien vegetation.



The impact of invasion is clearly noted on all properties in the area and spreading of Blue gum, Port Jackson, Black Wattle and Wild Guava is identified as a major risk. Once re-vegetation of disturbed areas commences, this impact could emerge as a significant impact since these plants are able to thrive in nutrient deficient soils, due to special adaptations in their nutrient uptake mechanisms, as well as nitrogen fixation bacteria living in their root systems. The necessary control measures must therefore be implemented.

Grassland in the mining area with a few bush clumps at the eastern perimeter of mine

With remedial measures in place the impact on vegetation is rated of low significance.

Impact on flora

	OPERATIONAL (no mitigation)	*WEIGHT*	*OPERATIONAL (with mitigation)*	*WEIGHT*	*CLOSURE*	*WEIGHT*
Extent	Local	2	Site Specific	1	Site Specific	1
Duration	Long Term	3	Medium Term	2	Short Term	1
Intensity	Medium	4	Low-Medium	3	Low	2
Probability	Definite	4	Definite	4	Probable	2
Status	Negative		Negative		Negative	
Confidence	High		High		Medium	
Significance	**Moderate**	**36**	**Low-Moderate**	**24**	Very Low	8

Remedial measures to be implemented are:

It will be possible to restore grassland areas with reasonable success with correct seeding methods, fertilizing and aftercare. With a dedicated re-vegetation programme, certain species will re-colonize affected areas immediately, whilst others will naturally establish themselves over time in the mine area. The specie composition will slowly improve, but will only reach maturity over the medium term. The success rate of re-vegetation will, however, depend on concurrent rehabilitation process, curbing of erosion and eradication of alien tree species.

- Mining will be restricted to the areas demarcated by the mine plan and no grassland vegetation outside the demarcated mine boundaries will be removed.
- The vegetation around the quarry must be retained as limited screens to protect the area against wind erosion and limit the visual impact.
- All topsoil will be conserved, reintroduced to disturbed areas, stabilized and vegetated during the rehabilitation phases.
- Only the approved haul roads will be used and vehicles will not traverse any virgin land.

- All slope areas will be properly stabilized through correct profiling and compaction of sub-soils.
- Disturbed areas will be revegetated with a grass cover by seeding with:

Cloris gayana	Eragrostis curvula	Themeda trianda	Digitaria eriantha

- 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. During the latter period barley could be added.
- Seed will be broadcasted by hand, where after seeded 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 improve the visual appearance of the site within a short time. Maintenance will be carried out until closure was granted.
- Water for irrigation purposes will be drawn from the farm reticulation system and should re-vegetation be exceptionally slow due to dry conditions, seeded areas will be irrigated once per week until a sufficient ground cover has been established.
- All natural vegetative matter removed will be reintroduced into the soil to possibly resprout, or as mulch that will improve soil properties.
- Once the area has been vegetated, an alien control programme will be implemented and if necessary, an herbicide such as Garlon will be applied. Solanum, Datura, Cisium, Ricinus Sesbania and Lantana could be a possible threat but can be pulled or chopped down since it does not coppice. *Acacia mearnsii* & *Acacia longifolia* do coppice and must be pulled in the juvenile stage or be treated with the said herbicide. All invaders will be removed before they reach seed bearing stage.
- Removed alien vegetation, if any, would not be burnt on site, but will be removed to the nearest waste disposal site.
- Once an area is vegetated, no traffic will be permitted in such area, except for on the internal haul road.
- Veld fires will be prevented, since it could affect the vegetation of the entire area, as well as impact on soil stability and fertility. No fires will be permitted in the mining area and the required fire extinguishers will be available in at least one vehicle that remains on site during the day. The necessary fire fighting protocol will be established with employees onsite.
- Grazing of domestic stock on re-vegetated areas will not be permitted within the first two years to provide for stabilization of soils and proper root development.
- 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.
- Should re-vegetation fail due to climatic conditions, it will be repeated the following growing season.
- If the applicant is not capable of rehabilitating phase 1 of the mining of the area, the operation will be temporarily suspended to address any outstanding matters.

FAUNA

Animals play an important role in maintaining ecosystem functioning, for example pollination, distribution of seeds, removing of insects, trimming of vegetation and therefore determining penetrability of vegetation and generation of manure, etc. The coastal grassland poses a definite ecological niche for animal species since it can provide adequate forage, nesting place and protection,

but only if not extensively grazed. Due to the resources that this veld types offer, faunal species diversity would be low-moderate and with specific emphasis on avian fauna. However, the area north of the mining area and most of the abutting surrounds, have been largely transformed to grazing and cultivation land with wild animals becoming increasingly scarce. Larger mammal sightings have become restricted and due to anthropogenic pressures, have come nocturnal. In addition, the close proximity to people would cause most wild animals in this area to move towards areas that are more secluded, for example the forest community to the south and to the riparian environments to the distant west and east. Considering that this section of grassland is the only remaining grassland in a relative big area and due to its status as corridor area, it will be essential to re-establish it as closely as possible to the original and an impact of low significance is anticipated.

Removal of the grassland will not result in the extinction of any specie, since any faunal species can be easily spotted in the study area and be relocated. This will result in a negligible impact on species diversity. Mining would be restricted to a limited area and the slow extraction rate would provide adequate time for migration of any animals remaining on site to be sustained in similar adjoining habitats. In addition, noise generated by vehicles will cause most animals to vacate the site temporarily. If certain species are to be affected, they would simply vacate the proposed mining areas during the day and return during the night and over the weekends, or once disturbed areas have been revegetated, especially as such areas will be withdrawn from grazing. Site visits conducted, revealed no small to large mammals, but a limited number of avian fauna was spotted, although no nesting was observed. The impact could be rated as low, due to the number of individuals and species that will be affected.

The positive economic impact of the proposed concern will outweigh the potential impact on fauna in the area. Subject to that animals are not disturbed/hunted by humans, it is known that animals grow accustomed to noises and would eventually return to their former niche area during quieter times or when disturbed areas are adequately rehabilitated.

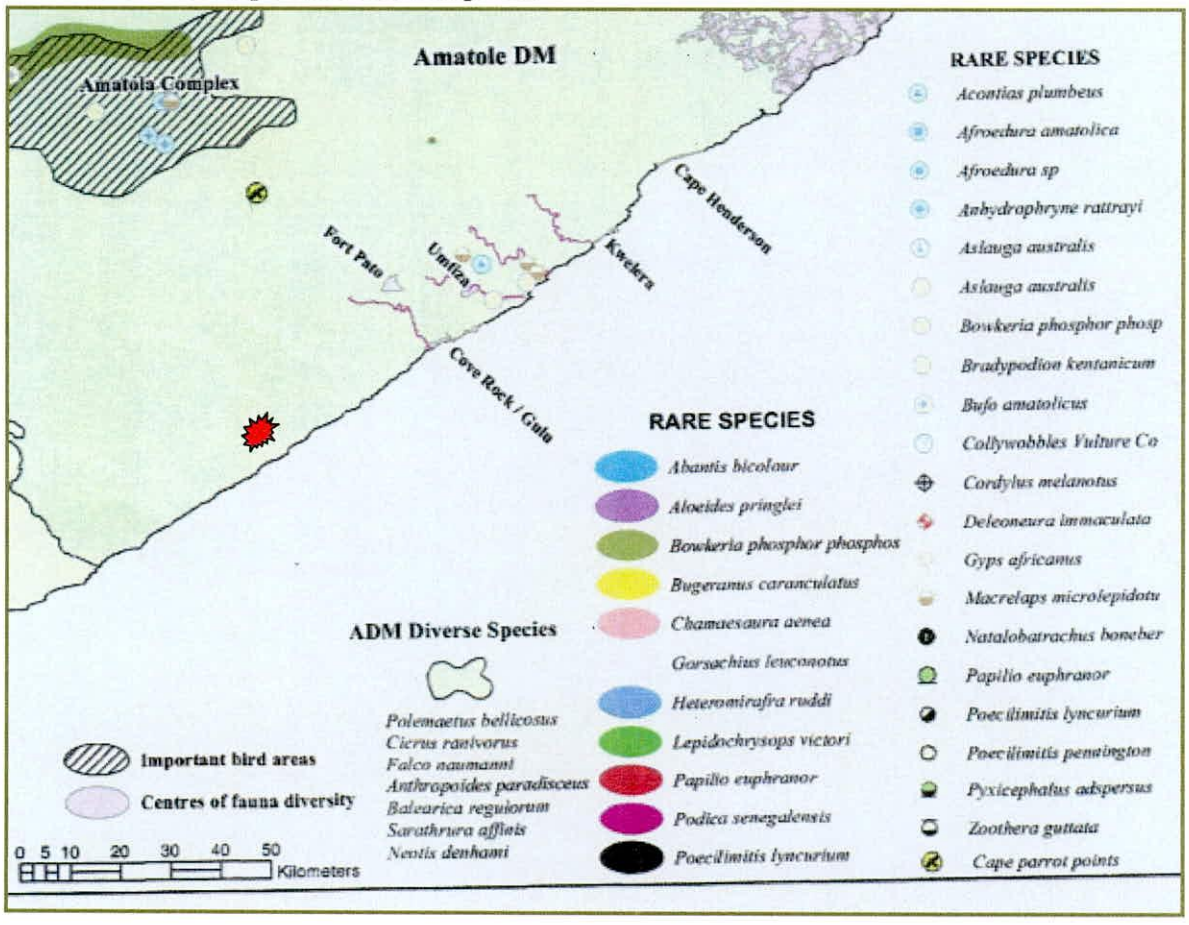
The noises generated on the site will be from a limited number of people communicating with each other and from the excavator, trucks and possibly a screen, but would not be excessive and noise levels are anticipated to range between 50 and 70 decibels at the mine boundaries. Most of the noises would be low-pitched and would have a lesser impact on audio systems of animals than what high-pitched noises would have. Should animals find 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 have to be enforced, with specific reference to the abutting eco-estate. The applicant will take responsibility for any animal that is proved to be killed by members of the quarry staff complement. Strict control measures will be put in place and severe penalties will be applicable if any animal on site is poached.

Of the more important species, the following could be located within the study area or surrounds or could visit the site from time to time:

Golden Mole (Chrysospalax trevelyani – Endangered), Blue Duiker (Philantomba monticola – Rare), Bushpig, Common Duiker (Sylvicapra grimmia), Large Spotted, Genet (Genetta tigrina), Scrub Hare (Lepus saxatilis). Bushbuck (Tragelaphus scriptus), and Porcupine (Hystrix africaeaustralis), Caracal (Felis caracal), Vervet Monkey (Cercopithecus aethiops), Honey Badger (Mellivora capensis) Ground Hornbill (Bucorvus leadbeateri – Vulnerable), Stanley bustard (Neotis denhami - Vulnerable), Grey crowned crane (Balearica regulorum - Vulnerable) and Grass Owl (Tyto capensis - Vulnerable) Blackwinged plover (Vanellus melanopterus, Near Threatened; aardvark (Orycteropus afra – Vulnerable

It is not anticipated that any of these animals will be extensively disturbed through destruction of feeding grounds and nesting sites and none should be killed in the mining process. It has been noticed at many other quarry sites that buck species, for example, visit quarry areas during the night and the same should apply to other faunal species, except maybe for avian fauna. According to recognized faunal surveys, the greater East London hosts a number of rare or red data species depicted on the map included, but it seems as if these species do not occur in or near the mining site. Rehabilitating the quarry site would provide the opportunity for animals to re-colonize the mine area. During the operational phase, the impact on the fauna is rated low, but at closure the impact is rated insignificant.

Distribution of important faunal species



Impact on fauna

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

Remedial measures to be implemented are:

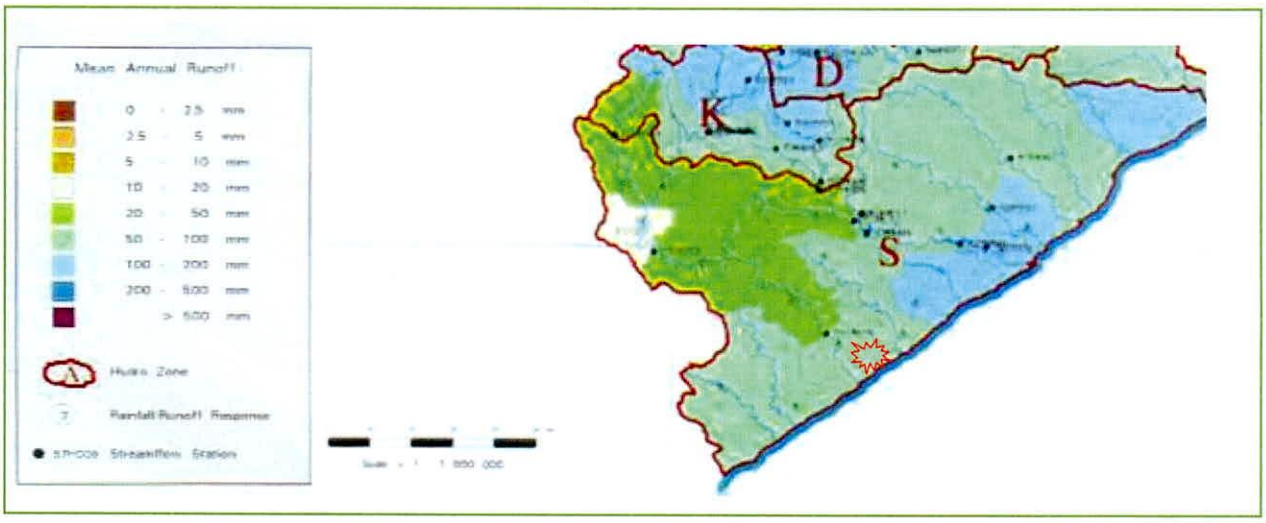
- Vehicles may not leak any fuel, oil or lubricants and will be maintained properly at all times.
- Fuel spills will be cleaned up immediately and the soil from spill areas will be removed to a registered waste site. When necessary, a substance such as saw dust will be used to reduce impact of spills.
- Handling of fuels will be in accordance with all applicable legislation to prevent pollution incidents.
- Vehicles will not drive within any vegetated areas and their movement 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 a limited environmental awareness programme that will be followed with workers.
- 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 permanently remove any of the staff caught interfering with wildlife from the site.
- All animals found in working areas where they may be injured, will be relocated to areas outside the mine area.
- The quarry area will be developed in phases and clearing of vegetation will be restricted to the minimum area required for optimal extraction of sand.
- Areas to be cleared at the quarry must be swept before vegetation and topsoil are removed. Relocate any herpentofauna 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.
- No vegetation outside the mine areas will be removed and spread of alien vegetation will be prevented.
- Veld fires will be prevented by not allowing any open fires in the mine area. Fire fighting equipment will be stationed in one of the vehicles that will remain onsite and/or at the residence of the landowner.
- 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 process.
- No pesticides will be used in a careless or uncontrolled manner in the mine area. No poisons may be placed in the veld.

SURFACE & GROUNDWATER

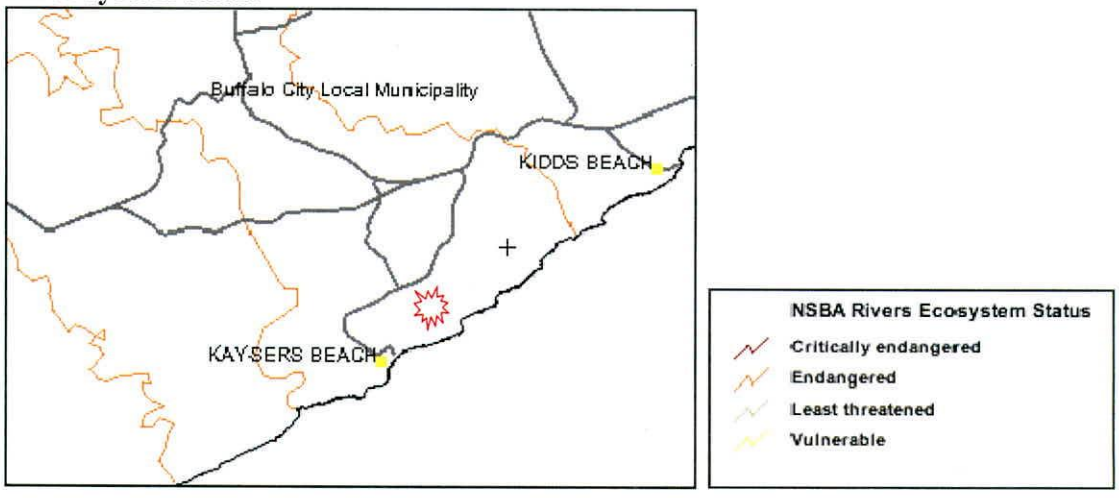
According to hydrology maps, the area falls within Hydro Zone S and Rainfall Zone R4A with an annual precipitation of 675mm and MAP-MAR response of 7. East London falls within the summer rainfall area. Annual evaporation is approximately 1400mm and surface water is not readily found in the study area, due to the high porosity of the mineral deposit. The moderate rainfall that the area receives would expedite the re-vegetation of the mine area and irrigation thereof might not be necessary during normal climatic conditions. Mean annual runoff varies between 100mm to 200mm. The site is also located in quaternary sub-catchment R40A and is administered under the Water Management Area: Umzimvubu to Keiskamma. The perennial Ncera River located further east of the mining area drains the area and is rated as a Class C system carrying an endangered rating and represents a moderately modified river system from which perspective silt loads of all runoff towards

the river should be minimized. Surface water of the East London area is well buffered and tends to be alkaline with bicarbonate salts dominating.

Runoff

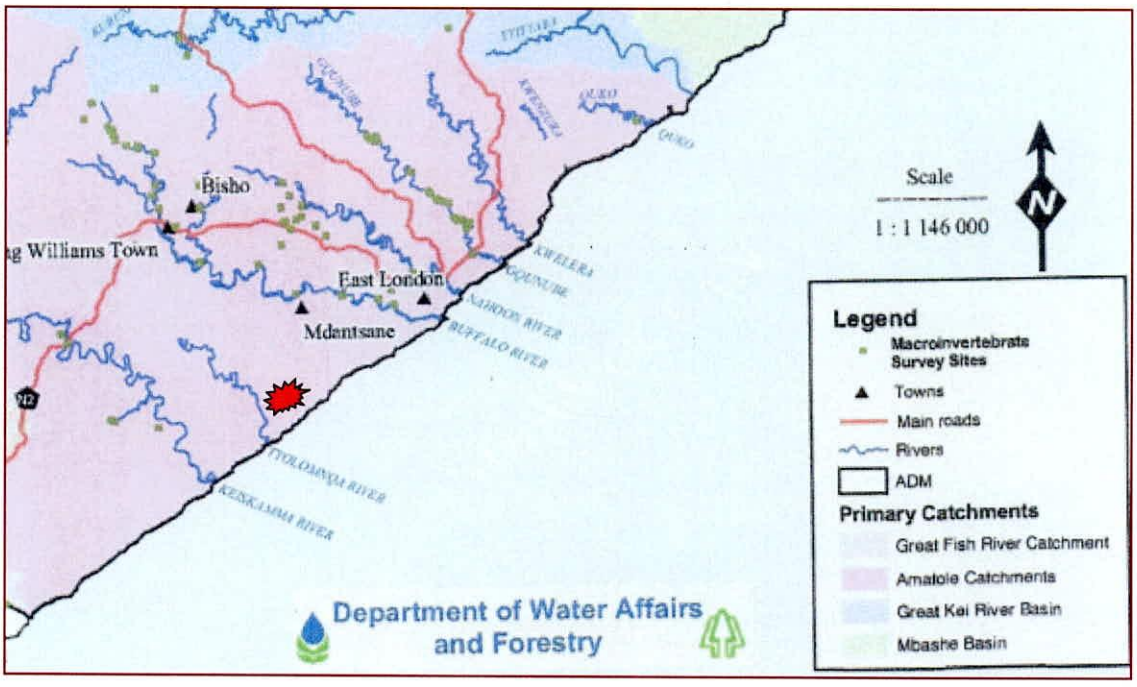


River system status



The larger catchment of the study area, which constitutes part of the western portion of the Amatola Catchment, reflects undulating dunes with gentle slopes covered mostly with grasslands. The area to the immediate north, reveals a flatter topography and different soil types disposing adequate clay content to facilitate temporary concentration of surface water. A few farms dams have been established in this lower lying area. In the study area the extensive E- horizon acts as a sponge and in combination with the vegetation in the area, causes runoff to be almost absent and surface flow is not readily observed. This scenario results in low erodibility index of 15. Due to the extensive 'vegetation filter' in place between the excavation and watercourses, it is not anticipated that any silt or waste from disturbed areas will reach any watercourse. Nevertheless, it is still necessary that rehabilitation of destabilized soils be progressively executed to prevent soil erosion and increase the visuals of the property. Drainage will mostly be by means of subsurface flow to either the coast or low lying areas to the north. The mining area falls within the sediment yield region 9 resulting in a low quaternary sub-

catchment sediment yield of approximately 30 000-60000 tonnes per annum. Water quality can be affected through an increase in suspended and dissolved solids and chemicals. In terms of the aforesaid, the land in this area is generally not susceptible to erosion and silt transport.



There is no water transfer scheme located close to the site. Because of the extensive distance to drainage lines and boreholes used for human consumption, emergency maintenance of vehicles may take place onsite. Increased use of the existing access road to the quarry would not readily contribute to increased sediment yield and can be considered negligible.

There is no natural surface water in the study area and it is drained by percolation into the sand body followed by horizontal flow towards the sea or drainage lines to the north-east. Removal of a portion of the E-horizon could result in decreased absorption capacity and increased seepage from the existing production faces, which in turn will result in increased surface flow along the quarry floor. It is anticipated that runoff will pick up some silt along the way resulting in a low TSS and TDS. Potentially it could also be contaminated with hydrocarbons. This water will be retained in the excavation and any pollutants will be filtered out by the extensive subsurface sand column.
Due to the anticipated mining, drainage patterns will be altered in a limited manner, but with no significant impact since water will still drain into the sand body and percolate down to bedrock and drainage channels located to the north-east and coast. As mining progresses and the disturbed area becomes larger, water will increasingly run off the faces and quarry floor, which could result in erosion and increase the silt load of runoff. Fortunately, all runoff will be restricted to the excavation with no significant impact on surface water quality.

No water abstraction points are in close proximity to the study area. The extensive distance to the nearest surface water would preclude that minor or even larger hydrocarbons spills would reach it and cause water pollution; soil pollution would be a more pronounced impact. Irrespective thereof, it is still necessary to maintain strict control over hydrocarbons, waste and sewage handling. No water will emanate from the quarry sites, but will be retained by the sand deposits encircling it. Only once

disturbed soils have been adequately stabilized and vegetated, the northern and eastern quarry faces will be levelled out and integrated with the immediate surrounds.

Once sand is extracted, increased surface volumes may occur for short periods since the sponge capacity of the area will be decreased substantially, but will be dependent on cut-off layers and depth of sandstone/clay mother material. Considering the extensive reservoir that the surrounding E-horizon creates in this area, the potential ponding of runoff for limited periods will pose no significant environmental impact and could in fact stimulate re-growth. Despite the above-mentioned, denuded areas still need to be vegetated as soon as possible. Increased runoff from the haul roads is not anticipated, due to the sponge capacity of the area, but the proposed cross drains will control any surface flow effectively.

Groundwater

The main groundwater aquifer in this area will be restricted to the Table Mountain sandstones at depth and the impact on the main aquifer would be negligible, especially taking into consideration the magnitude of the operation and the size of the mine area. Due to the high permeability of the sand horizon and the thickness thereof, perched aquifers will develope through infiltration and downward percolation of water, especially at the contact zone with the mother material. This aquifer will not be affected due to the depth thereof. In terms of quantity it will not be affected, except for the portion lost through possible evaporation when surface water accumulates for brief periods. The perched aquifer is not a reliable source of water, since it is highly dependent on precipitation and thus susceptible to even short periods of droughts. Yields from this secondary aquifer have been measured as between 0,1-1 L/s. The geology of the mine area causes this secondary aquifer to be between 10-20m meters below ground level. Mining to a depth of 3 meters would thus not affect ground water quality or availability. Since this perched aquifer is not commercially used and the site is distant to any boreholes, the impact is rated insignificant. 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 20m. Since there would be 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 and since no runoff will leave the site during the operational phase, recharge of the aquifer will also not be affected and the impact can be rated as insignificant. The aforementioned reasons will also prevent any impact on groundwater quality or yielding of boreholes in the larger area.

Groundwater quality

Sewage facilities

The proposed chemical toilet may potentially cause a negligible increase in coliform levels of perched aquifers if the required maintenance is not conducted, but not the main aquifer. Two factors will reduce this impact, namely that the subsurface material (E-horizon) has a very large sponge capacity and would be able to absorb any limited contamination of the soil horizon and since the E-horizon is not the main water bearing strata and only poses a secondary or perched aquifer, is limited and not used for human consumption within the immediate surrounds. The limited time that this facility will be in place will reduce the impact to some extent which would be less than the impact of sewage systems at residences on the farms in the area. The high internal drainage may on the other hand cause increased

vertical percolation of contaminants, but since the area have a negative water balance, the impact would remain low. The main aquifer is located within the Table Mountain Sandstones, which will be protected through dilution factor due to the extent of the E-horizon.

Hydrocarbons

Handling and storage of hydrocarbons onsite will be controlled as discussed under the chapter dealing with soil matters and no extensive spills are anticipated taking into consideration the volumes of hydrocarbons involved. Possible storage of fuel in fuel tanks of vehicles and the generator of the screen could pose a limited groundwater pollution risk, but with the mitigation measures stipulated, the risk would be substantially reduced. The limited spills that could occur will not affect the main aquifer due to depth involved and the impact therefore is rated insignificant. Perched aquifers could be affected more substantially, but the extent and absorption capacity of the aeolian deposit will result in a temporary impact of very low significance. It should be recognized that hydrocarbons are biodegradable and small spills will be naturally remedied in short period of time. The fact that vehicles will not be cleaned or serviced onsite and that no hydrocarbon storage facilities be established, will ensure a very low impact.

Waste

The mining site will house very little waste that could affect groundwater quality. The waste stream will be restricted to household waste, which will be deposited in 200l drums fitted with a proper lid. When filled, it will be emptied at the nearest approved waste site, which will either be the Kidds Beach waste facility, or the Kaizer's Beach facility. 'Industrial waste' will be restricted to limited scrap metal and machine parts, which will not be stored onsite, but immediately be disposed of at a registered recycling facility. Considering the above, no treatment facilities are required for the site. The impact is rated negligible.

Water Consumption

Potable water will be brought to site from the landowner's residence. Irrigation water would be drawn from the farmer's borehole, but will on average not exceed $7m^3$ per day every third day during extreme dry periods and 10 cubic meters every week during the initial stages of germination and will not cause over utilization of the main aquifer, since it will constitute a mere 45 minutes of pumping every third day. Water for dust suppression should not exceed 10 cubic meters per day, but then only during periods of high winds. It is important that the irrigation system does not constitute the normal sprayer system, but rather a finer mist spay to reduce water consumption. The impact of water usage by the proposed quarry concern is rated low and will not exceed water consumption that is relevant to farm households or residential developments.

Impact on ground water quality and reserves

	OPERATIONAL (no mitigation)	***WEIGHT***	***OPERATIONAL (with mitigation)***	***WEIGHT***	***CLOSURE***	***WEIGHT***
Extent	Local	2	Site Specific	1	Site Specific	1
Duration	Short Term	1	Short Term	1	Short Term	1
Intensity	Low	2	Very Low	1	Negligible	0
Probability	Probable	2	Probable	2	Unlikely	1
Status	Negative		Negative		Negative	
Confidence	High		High		High	
Significance	Very Low	10	Insignificant	6	Insignificant	2

Surface Water

Due to the high internal drainage of the E-horizon, the extent thereof and extensive vegetation cover around the site, runoff is seldom witnessed on the coastal dunes and is channelled via sub-surface sheet flow to low-lying areas north-east of the mine areas, the coast or percolate into TMS at depth and therefore responsible for recharge of primary aquifer. Exposed quarry faces will therefore not experience any surface flow. Cut-off layers or calcrete lenses at lower levels may result in short term ponding with no significant environmental impact, except for possible increased vegetation growth.

Water quality can only be affected through an increase in suspended and dissolved solids eroded from the exposed quarry and plant surfaces. In addition, chemicals in hydrocarbon spills could limit toxic aquatic environment. Since surface water is not readily expected to accumulate on site and the possibility of extensive hydrocarbon spillages is limited, a negligible impact is predicted.

Topsoil will be positioned on the perimeter of each phase on higher levels and therefore out of reach of any runoff. The sand has been leached over many years and contains very little silt and limited potential for siltation of surface or groundwater is predicted. The access road could be a source of increased silt laden runoff because of the pulverizing effect that vehicle movement will have on the wearing course, but it will be discharged via proposed drains into vegetated areas and will be absorbed by the sand deposits in these areas.

Storm water could also facilitate the movement of spilled hydrocarbons to the low-lying areas, which could potentially affect chemical and oxygen levels of surface water. The limited extent of anticipated spills and the high internal drainage of the strata in this area would prevent any such surface flow. Maintenance of vehicles will take place off site within a designated workshop and vehicles will be maintained to leak-free condition. No regular maintenance of vehicles will take place on site and no oils and lubricants or used hydrocarbons will be stored within the mine areas. No used hydrocarbons will be drained into the soil, but will be sold to a recycling company.

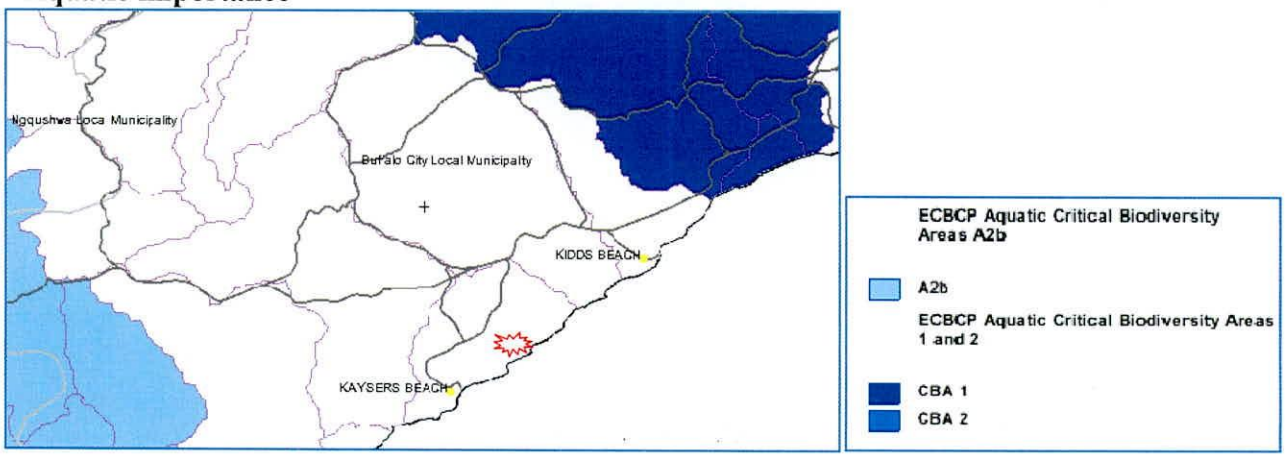
River morphology and in-stream activities

Due to the distance to the nearest watercourse, no impact on river morphology is possible.

No movement of machinery is taking place within any stream or ephemeral watercourse, hence the impact on water quality would be insignificant. Because of the extensive distance and vegetation buffer between the concern and any watercourse or water accumulation point, no silt or hydrocarbons will reach it. Therefore, aquatic life or general ecological status of any watercourse or water accumulation area below the proposed concern, will not be affected. The overall impact is rated negligible.

In terms of the Eastern Cape Biodiversity Conservation plan the study area is not a sensitive/important site

Aquatic importance



Water abstraction & flow volumes

No water will be abstracted from any watercourse. Because of the reduction in sponge capacity, surface flow could be negligibly increased with no significant environmental impact.

Impact on surface water

	OPERATIONAL (no mitigation)	*WEIGHT*	*OPERATIONAL (with mitigation)*	*WEIGHT*	*CLOSURE*	*WEIGHT*
Extent	Local	2	Site Specific	1	Site Specific	1
Duration	Short Term	1	Short Term	1	Short Term	1
Intensity	Low	1	Low	1	Negligible	0
Probability	Unlikely	1	Unlikely	1	Unlikely	1
Status	Negative		Negative		Positive	
Confidence	High		High		High	
Significance	Very Low	4	Very Low	3	Insignificant	2

Remedial measures to be implemented are

- Chemical toilet will be maintained to specification and will be inspected on a regular basis.
- No storage of hydrocarbons will take place onsite, except for fuel in fuel tanks of vehicles.
- Mining will be restricted to the proposed depth and footprint.
- Production faces will be protected against erosion to prevent increased overland silt transport by means of the mechanisms stipulated in the chapter on 'Soil & Vegetation".
- Disturbed areas of the mine will be vegetated as soon as possible and as per rehabilitation plan.
- No foreign or unapproved material/substance will be dumped or stored within the footprint of the mine or office areas.
- No stockpile of any nature will be placed in close proximity to any drainage area and will be restricted to the quarry floor and if necessary, next to the screening plant.
- Haul roads will be protected against erosion by construction of cross drains.
- Vehicles will not use alternative roads or damage vegetation outside the approved mine boundary.

- Waste will be contained in receptacles stationed at appropriate areas and will 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.
- Refuelling of vehicles will be done with appropriated funnels to limit spills.
- Emergency repairs must be limited, but if necessary, will be done over suitable drip trays but should preferably be restricted to the workshop of the landowner.
- 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 removed from the property on a daily basis to an approved facility.
- If spills do occur, the affected soil will be removed to an approved waste site or in case of minor spills, the soil can be treated with fertilizer to facilitate in breaking down hydrocarbons.
- In case of large, critical spills, the Departments of Water Affairs and DME will be informed immediately for assistance and advice and a competent company conversant with bio-remediation will be appointed to address the possible impacts of such spill.
- Management will not entertain hydrocarbon spills on site and where necessary, financial penalties would be imposed on workers in cases proving 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 removed from site immediately.
- The applicant accepts the principle of 'polluter pays'.

AIR QUALITY

The air quality of the mine areas and immediate surroundings, is excellent due to its rural status. Decreases in air quality are short term and in most cases relate to an increase in dust generated by gravel roads, or an increase in smoke related to cooking fires from farm labourers, occasional burning of domestic waste or veld fires. However, large tracts of land are annually ploughed to create pasture areas or produce fodder for livestock and it was observed that extensive dust is generated in these areas. This phenomenon is therefore well known to local inhabitants and is accepted as part of the farming industry. Air quality is therefore substantially reduced during adverse climatic conditions.

Dust

Since the properties involved are still zoned agricultural and rural, it would cause maximum tolerable ambient levels to be slightly higher than those for residential areas. It would, however, still require that the applicant implement measures to keep disturbed areas as small as possible and to reduce dust generation from topsoil stockpiles either through re-vegetation processes,or irrigation.

The mineral *per se* is not a harmful substance and should not cause any discomfort to people, except for being a nuisance factor. The amount of dust generated in a mining area, is directly linked to the type of material that is extracted, mechanical processes involved, traffic volumes, wind speed and soil moisture content. The finer the material (more easily airborne) and the higher the clay and silt concentrations, the more severe the impact will be. The dryer the soil becomes, the more dust it generates and therefore topsoil must be replaced, seeded and irrigated as soon as possible. As an alternative, it could be covered with tree branches or Hessian sheets.

Aeolian sand deposits normally contain only small amounts of dust, which are derived from the geological formations in the area and therefore aeolian sand deposits will not have a detrimental impact on the abutting landowners and can for example not be compared to the dust generated on farms in the Free State, which dispose of an extensive amount of clay and silt particles. Deeper sand layers are even more course and will further reduce the affect of wind erosion. Mechanical processes are restricted to mining, loading and possibly screening and no pulverizing of sand particles will take place hence dust generation during normal climatic conditions would be very low. The strong western and eastern components of the East London wind rose may during dry periods, which are quite frequently experienced, liberate moderate amounts of sand particles from the quarry areas into the atmosphere and may cause deposition of small amounts of sand near the farm residences, but particularly in the area abutting the eco-estate area. This impact would not necessarily be the result of the quarry activities alone, since sand/dust movement is a common phenomenon on all properties during the drier periods. Dust impact on the abutting properly will mostly be restricted to winter months when north-easterly winds dominate. Since calms along the coast are rare, adverse impacts caused by air inversions at night are not a consideration.

The nearest residences are located approximately 700m to the east and northwest and might receive a minimal amount of sand/dust when high winds prevail. The applicant is, however, confident that with mitigation measures in place, no impact will be imposed on these residences. It is generally accepted that most dust particles are deposited within a few hundred meters from the source and should particles get airborne, it will be deposited within the environment before these residences are reached. However, due to the closer proximity to the Eco-Estate, it could mainly during the winter months experience a more significant impact and the prescribed mitigation measures must be implemented. Once mining has reached phases 2 & 3, the significance of the dust impact will be less significant. In addition, since residences within this area have not been established, it is anticipated that the deposit will be mostly mined out by completion date of the Eco-Estate development. It should also be taken into consideration that clearing of vegetation at building sites will equally produce dust during adverse climatic conditions. Should the mine area be limited to the smallest possible area and if concurrent rehabilitation is affected and irrigation of disturb areas take place during periods of high winds, low-moderate impact is anticipated during phase 1 and a low impact during phases 2 & 3. As a precautionary measure windbreaks will be established across the wind path, which will reduce dust/sand transport significantly. With the aid of the proposed dust suppression system, the significance of the impact can be reduced to acceptable levels. On the other hand, if no mitigation is implemented, an intolerable scenario can be created once residences in the Eco-Estate have been built. However, it should be borne in mind that the worst-case scenario will occur in less than 20% of the year and will be an intermittent event. It is anticipated that the dust count in the abutting area will not be increased with more than 250mg/m^2 per day if dust impacts at other quarry concerns in the Province are taken into account. Although this level falls within the DEDEA limits, it will result in sporadic complaints. With mitigation, dust levels will be reduced to approximately 100mg/m^2 and should be acceptable to any resident in this particular area.

The removal and storage of topsoil will pose a much higher risk in terms of dust generation and this need to be controlled effectively, especially during high wind events since it could result in a significant nuisance impact on residents of the Eco Estate. If the mentioned targets cannot be met during adverse climatic conditions, alternative measures such as full time irrigation will be considered and under extreme conditions, the cessation of quarry operations. In order to reduce the possible impact, stockpiles of sand and production areas must be limited to only the necessary. When removed or reintroduced to disturbed areas, topsoil should be irrigated and seeded as soon as possible. Stored topsoil heaps must be properly covered with Hessian.

The demand for sand will increase vehicular traffic extensively and will result in the powdering of wearing course material and will cause a much more pronounced dust impact along the road which may affect nearby residents and as worst case scenario, a small dust plume may appear and would have an impact on the aesthetics of the area. It is anticipated that at least six trips per hour will be applicable which means a trip every 10 minutes. The impact of this activity will, however, be reduced by the distance to farm residences and the use of a proper weathered dolerite wearing course. This material is ideally suited to reduce dust generation on gravel road. Under normal climatic conditions, the impact will be low but during windy periods, the impact could be of low-moderate significance. Since dust generation is also determined by speed in conjunction with axle number, it is imperative that the applicant reduces haul speeds to 30km/h and strictly enforce this. In worst case scenarios, applicable sections of the road can be watered down occasionally if dust levels are elevated above acceptable levels.

The mentioned impact might affect people struggling with acute allergies for dust marginally, but due to the anticipated intermittent nature of the impact, the significance of the impact and the amount of people that could be affected cannot render this impact a fatal flaw. In the author's opinion, pollen from the numerous alien trees in the greater area (Acacia species) and dust generated on farm land would play an equally pronounced role than the liberation of dust from the quarry area. It would therefore be unfair to single out the proposed quarry as the sole perpetrator for causing allergies, although it could cause a cumulative impact.

With any rain, dew, or mist, which the coastline is frequently exposed to, the dust liberated into the air will decline drastically. The impact of dust on photosynthetic activity of plants is not well researched, but such impact would be negligible taking into consideration the levels of dust. The vegetation of abutting former quarries in this area revealed no visible impact in terms of biomass accumulation. Since no crop production is taking place within the immediate area, no impact in this regard is anticipated. No odours will be generated by the mining operation.

Emissions

Vehicular emissions will be related to one frond-end loader and a number of trucks and it is anticipated that the impact would be much less than the impact caused by traffic on the other roads in the area.

Smoke Generation

People would not reside on the property, therefore no burning of wood fires or waste generating harmful smoke or any other form of chemical air pollution is envisaged. The overall impact on air quality could be rated as insignificant.

Health & Safety

In terms of the Mine Health and Safety Act, the silica content can be established to determine whether any special precautionary measures are required. Under normal circumstance respirable counts at sand quarries are very low since material is not processed and fines generated. The impact can be rated as intermittent (based on wind direction), local and very low, considering the amount of people that might be affected. If the DME requires dust analysis, gravimetric dust sampling could be done to establish whether the health of abutting landowners will be adversely affected.

At closure, all sand and topsoil stockpiles will be removed and disturbed areas will be vegetated or tunnels will be established with the result that dust generation on site would be almost eliminated.

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. The perception of noise impact is more intense in the morning and evening than during the rest of the day and is 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 can be expected from communities/residents.

The rural setting of the area would, under normal circumstances, probably cause the ambient noise levels to be well below 45dB, but levels will be intermittently elevated to approximately 65dB close to the gravel roads and farming activities. It is accepted that the objective of residents buying property in the Eco-Estate area, was to experience the serenity and ambiance which it offers, but also need to accept that it is a farming community where noise generating activities are taking place. Aspirations of new land owners should also be weighed against those of long term property owners in the area and such landowners cannot be prevented to conduct business that will ensure their livelihood, provided that such activities are conducted within the parameters' provided by legislation. It is therefore important that the applicant reduce noise levels to the best of its ability and that abutting landowners adopt the approach of 'live and let live' without insinuating that unacceptable conditions must be accepted .

Noises to be generated will generally be low-pitched and no complaints are expected. Adverse conditions such as low cloud cover or strong winds blowing towards recipients could increase noise levels between 3 & 7dB, but considering the distances of approximately 700m to farm residences, the impact is rated of very low significance. However, noises will be more pronounced in the abutting Eco-Estate once owners have moved to the site, but this impact will be reduced substantially once phases 2 & 3 are reached. Considering that it will take time to complete residences in the Eco-Estate, it is anticipated that mining will be mostly completed by the time that residents occupy the land. It is anticipated that no residents will be located within 200m from the site and thus a low-moderate impact is anticipated if no mitigation measures are implemented.

Sources of noise will be the excavator, loader, screen (possible) and trucks at the mine area and noise levels will be raised to between 60dB and 65dB at source. Within 200m from the quarry, noise levels will abate to approximately 55dB, and within 500m to ambient levels. Noise levels at the nearest residences will therefore not be raised above 55dB during the inception of phase 1 and not above 50dB at the start of phases 2 & 3. Since the mine will slowly move downhill, the difference in elevation level will increase over time and will result in a further reduction of noise levels on the western boundary. The most prominent and irritating noise will be the reverse hooters of the front-end loader and trucks. If this impact causes significant complaints, the use of an excavator should be considered. Mining

during the early morning hours or at dusk or over weekends is not anticipated which will further reduce the significance of the noise impact. The noise impact of the quarry is rated of low significance with mitigation measures in place.

Trucks on the service road will cause noise disturbance of approximately 65dB all along the road. Considering that the distances to residences are in excess of 200m, it will be reduced to approximately 55-60dB, which is acceptable, although it will approximately be experienced every 10 minutes. Reduction of vehicle speed should therefore be enforced to reduce noise levels. The locality of the Lilyvale School is of some concern as it was built directly along the western side of the road and will therefore experience a cumulative impact, which cannot be mitigated and the impact is rated moderate.

No workers will be housed on the property, therefore noise generated at night would not become a nuisance. 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.

Impact on air quality

	OPERATIONAL (no mitigation)	***WEIGHT***	***OPERATIONAL (with mitigation)***	***WEIGHT***	***CLOSURE***	***WEIGHT***
Extent	Local	2	Local	2	N/A	0
Duration	Short Term	1	Short Term	1	N/A	0
Intensity	Low-Moderate	3	Low	2	N/A	0
Probability	Likely	3	Likely	3	N/A	0
Status	Negative		Negative		N/A	
Confidence	High		High		N/A	
Significance	**Low-Moderate**	**18**	Low	15	N/A	0

Remedial measures to be implemented

- Vehicles to be maintained properly and fitted with standard exhaust systems and will not be left idling unnecessary.
- No cooking fires will be allowed on the property.
- No chemicals will be stored or be disposed of on site.
- Waste will not be burnt on site. Waste will be retained in proper receptacles placed at the plant area, offices or quarry and be removed to the waste site regularly. The waste stream will be limited and be removed from site weekly to prevent odours from occurring.
- Wearing course of roads will be regularly upgraded with weathered dolerite and watered down when dust levels require.
- The mine will be developed in phases to reduce the extent of exposed areas.
- The minimum area required for optimal mining will be denuded.
- Disturbed mine areas will be re-vegetated as soon as possible as per the re-vegetation plan.
- If dust generation reaches unacceptable levels, Hessian will be used to cover topsoil stockpiles and production faces and shade cloth windbreaks will be established across the wind path within disturbed areas.
- During periods of high winds and liberation of excessive dust volumes, disturbed areas will be watered down by means of a sprinkler system. Equipment for this purpose must be obtained prior to commencement of mining operations.

- Should the service road liberate unacceptable dust volumes into the air, appropriate sections of the road will be watered down.
- Sand and topsoil stockpiles will be kept as small as possible and their height restricted to 2m to reduce dust generation and wind erosion potential.
- Handling of topsoil and sand during periods of high wind action will be avoided when possible. 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.
- 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.
- Trucks should not follow one another when exiting or entering the quarry surrounds, to limit the duration of noise and dust impact.
- Travelling speed on the gravel haul roads will be reduced to 30km/h.
- Moving parts of machinery/screen will be regularly lubricated, replaced and serviced.
- Normal working hours will apply for weekdays (7.30am-5pm in summer and 8am-4.30pm in winter). No work should be considered on public holidays, weekends or Sundays.
- Workforce and contractors will be properly managed in terms of noise generation and be informed on acceptable behaviour.
- Truck drivers will be tasked not to unnecessary use exhaust brakes when entering the property or mine area or when turning into the access road to reduce noise generation at the school. Travelling speed should be substantially reduced when nearing the school area.
- Protective ear devices will be provided to all operators of machinery/vehicles generating noise above 60dB at source.
- If disputes develop between the applicant and any affected landowner regarding the impact on air quality, the necessary noise and dust measurements must be done and all parties should accept the outcome and make the necessary adjustments required.
- The applicant should liaise with abutting landowners on the impact of the mine on a regular basis and together devise strategies to resolve such impacts.

WASTE GENERATION AND MANAGEMENT

Building rubble

No construction activities are anticipated for the quarry, therefore no cement residue, brick residue, corrugated plate cut offs, ceramic waste or PVC residue would be generated. The screen, if required, will be mobile and established within the pit and therefore no construction activities are anticipated in this regard. At closure the screen will be removed from the farm within 1 month after cessation of mining activities.

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

Industrial waste

Very little industrial waste will be generated and will be restricted to the odd tire casing and dysfunctional equipment, which will be removed from the property on a weekly basis. No impacts on soils, water vegetation, air quality and humans are anticipated.

Domestic waste

The waste stream consisting mainly of domestic waste (food, bottles, plastic bags, paper, clothing, rags, etc.) will be small and deposited in the containers provided for this purpose. Refuse bins will be clearly marked and placed at the entrance to the property concerned and at the entrance to the quarry in strategic areas to encourage workers to use them. 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 and poor visuals. Due to the limited number of people that will work onsite, the limited waste stream will have negligible impacts on soils, water vegetation, air quality and humans.

Mine residue

The geology of the area restricts the type of potential residue to potential calcrete nodules and root mass that could be screened from the sand, but it should be noted that screening was not necessary at any of the other quarry areas in the Kidds Beach/Kaizers Beach areas. If calcrete material is screened out, it will be returned to the excavation and be covered with topsoil on a monthly basis, whilst vegetative matter will be worked into the topsoil. Storage and reintroduction of this material will have no impact on environmental parameters. The amount of surface vegetation to be removed will be low and will be reintroduced to profiled areas to improve the percentage organic matter in the soil.

Since no chemical processes, mineral processing or washing plant is required on site, no chemical/mineral waste or effluent will be generated. The cumulative impact on soils, vegetation, and aesthetics is rated of low significance.

Sewage system

The sewage system will consist of a chemical toilet. Due to the limited number of people on site, the effluent stream will be limited to approximately $0,5m^3$ per month and impacts on soils, groundwater, air and humans are rated of low significance.

Hydrocarbons

The mine area could produce small amounts of used hydrocarbon waste such as used oil, lubricants and hydrocarbon-contaminated filters through emergency servicing of equipment and vehicles and could generate a small amount of hydrocarbon waste. These will be stored in a container and will, with dysfunctional parts, be removed to respectively a registered recycling facility and hazardous waste site at Berlin periodically.

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

Salvage yard / Scrap metal

Since it is a mechanized operation a small amount of scrap metal will be generated, but will be removed on the same day, therefore the impacts on soils and aesthetics are rated very low.

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

Impact on air quality

	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Local	2	Site Specific	1	Site Specific	1
Duration	Short Term	1	Short Term	1	Short Term	1
Intensity	Low	2	Very Low	1	Negligible	0
Probability	Probable	2	Unlikely	1	Unlikely	1
Status	Negative		Negative		Neutral	
Confidence	High		High		High	
Significance	Very Low	10	Insignificant	3	Insignificant	2

Remedial measures to be implemented

- The odd tyre casings that will be generated will be disposed of immediately at the nearest registered waste facility.
- A chemical toilet will be placed at the quarry and it will be serviced and emptied at an approved waste site on a regular basis.
- The sensible use of water and ablution facilities will be incorporated into the environmental awareness programme.
- Strict controls will be enforced to ensure that the surrounds are not used as ablutions and this aspect would be included in the environmental awareness programme.
- Domestic waste generated ancillary to the mining process will be deposited in containers with scavenger proof lids placed at the office and quarry. It will be removed weekly from the site to the nearest waste facility and should not be 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.
- Waste will not be burnt or buried on site.
- Staff will be equipped to distinguish between domestic waste and industrial waste.
- Calcrete nodules will be returned to the quarry floor and be covered with topsoil.
- No day-to-day repairs or servicing of vehicles or equipment will take place on site. If required, emergency repairs will be done over suitable drip trays and all lubricants and oils drained during servicing of vehicles, will be funnelled into appropriate receptacles and removed offsite to a recycling company on the same day.
- Appropriate receptacles will be stored at the farm workshop for storage of used hydrocarbons drained during emergency repairs/services. Additional receptacles will be provided for contaminated filters, gaskets, spares, and removed off site on a daily basis to an approved hazardous waste facility.
- No hydrocarbons will be drained into the soil.
- All hydrocarbon-contaminated material, including soil, will be disposed of at a hazardous waste facility and the affected area will be treated with fertilizer or bio-remedied by a specialist in case of any large spills.
- The handling of hydrocarbons will be included in an environmental awareness programme to be developed at a later stage.
- No washing of vehicles will take place on the property.
- Any unusable scrap metal or dysfunctional machinery in the mine area will be collected and removed on a weekly basis and no permanent storage space will be earmarked for this purpose.
- All vegetation removed will be used as organic material in the rehabilitation process.

- At closure all remaining sand and topsoil stockpiles will be flattened and reintroduced to disturbed quarry area.
- A general clean up of the property will be done before closedown at the end of each year.

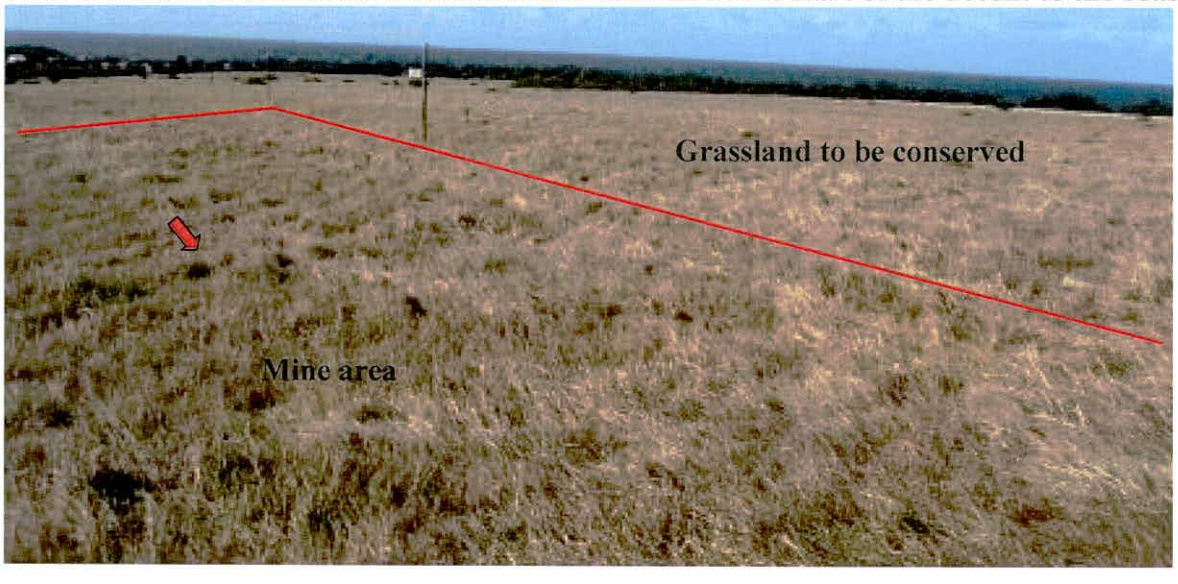
VISUAL/AESTHETIC IMPACT

The current landscape can be described as moderately attractive due the prominence of the high dune and the absence of infrastructure in the study area. However, the establishment of pasture areas, roads, the Eskom substation, power lines, the homogeneous grassland and the few residences in the surrounds to some extent impact on the aesthetic value of the area. Onsite assessment of immediate landscapes revealed that the proposed mine is bordered on the northern side by transformed land with low aesthetic value, whilst very pleasant views of the coastal flats to the south with the ocean in the background have been recorded.

View to the east with Seavale residential area and farm residence in the distance

View to the south-east with farm residence and sea in the distance

View to the south with coastal thicket in the distance at the start of the decent to the coast



Transformed grassland and visuals to the north

Visuals to the north with mining area and Eskom substation located in the distance

Since the study areas and surrounds are sparsely populated and because of the undulating nature of the dune system, as well as the difference in elevation levels, the proposed mine will not be easily observed from the north and not from any road in this area. The mine will only be visible from a distance from the Seavale Residential area and from the southern part of the Eco-Estate road. It is not anticipated that the quarry will be visible from future residences in the Eco-Estate. The fact that the mine area does constitute a focal point in the landscape will result in the visual impact being increased. It should however be taken into consideration that only 1,5ha will be developed and that disturbed areas will progressively be rehabilitated. The fact that surrounding areas already dispose of low quality landscapes, results in that cumulative impacts should be avoided by a concurrent rehabilitation process and in the process, prevent the mine from being an eyesore in the landscape.

Since the proposed mining sites are not readily visible from roads to the north and since the study area does not constitute a major tourist destination, the impact on tourist potential is rated very low.

Since the concern is located in homogeneous grassland, environment disturbances will not be absorbed very well by the general landscape and the disturbed area must be kept as small as possible. The fact that mining will change the texture and colour of the area will increase visibility in a limited way and will still necessitate that production areas be profiled and re-vegetated concurrently with extraction activities. The fact that the mining process will recreate the same slope, although at a lower level, and because the production faces will be properly profiled and later integrated with landscape levels to the east and north, will mitigate the above mentioned impacts significantly. If rehabilitation is properly conducted, the post mining site will be successfully absorbed in the landscape.

Infrastructure required on the property concerned, if any, will be limited and positioned within the excavation hence visibility will be reduced. This impact would be temporary since all infrastructure will be mobile and will be removed at closure. Visibility from the air would be low, since aircraft would at this chainage already have reached substantial heights and this impact is rated very low. It nevertheless remains important that a phased rehabilitation approach should be followed to ensure that the minimum area is disturbed at any given time and that progressive rehabilitation takes place. Uncontrolled dust generation will enhance visibility of the site significantly, due to its prominent locality on higher levels and must therefore be controlled effectively.

No visible stockpiles would be established on the quarry floor which will cause the quarry operation to become more visible. Dust generation on the haul roads will cause a dust plume to hang in the air during periods of high extraction and adverse climatic conditions and this aspect need to be addressed through the placement of a proper wearing course and damping down appropriate sections of the haul road. The mining operation and screening process will liberate insignificant dust volumes into the air and the impact is rated of low significance.

Visual Impact

	OPERATIONAL (no mitigation)	***WEIGHT***	***OPERATIONAL (with mitigation)***	***WEIGHT***	***CLOSURE***	***WEIGHT***
Extent	Local	2	Local	2	Site Specific	1
Duration	Medium Term	2	Medium Term	2	Short Term	1
Intensity	Medium	4	Low-Medium	3	Low	2
Probability	Definite	4	Likely	3	Probable	2
Status	Negative		Negative		Positive	
Confidence	Medium		High		High	
Significance	**Moderate**	**32**	Low	21	Very Low	8

Remedial measures to be implemented are:

- No vegetation clearing will take place outside the proposed mine area.
- No vegetation along the western fence line will be removed and the 30m buffer zone will be maintained at all times.
- No vehicle movement will be allowed outside the mine boundaries, except on designated roads.
- The proposed mine areas will be kept clean and free of litter on a continuous basis. A monthly clean up of the entire property 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'.
- Clearing of vegetation will be restricted to the minimum required for optimal mining.
- The faces of the quarry will be rounded off through a cut and fill action to create a minimum slope of 1:3.
- Cuts will follow curvilinear lines, which will blend in with those of the surrounding landscape, rather than straight geometric lines.
- If needed, storm water control structures will be put in place to maintain the stability of the soil on the quarry floor.
- No erosion will be tolerated onsite and will be immediately addressed as stipulated in this report.
- Alien vegetation will be removed on a continuous basis to ensure that established vegetation blends in with surrounding vegetation.
- Excessive dust plumes will be eliminated through wetting of haul roads and stockpile areas.
- At closure, all disturbed areas would have been rehabilitated as per the re-vegetation plan or new tunnels would have been established.

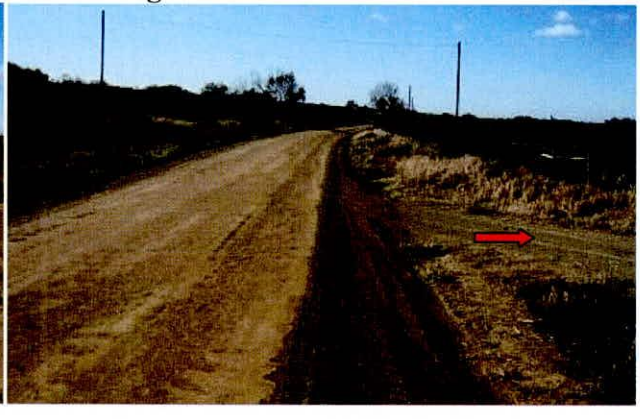
TRANSPORT IMPACT

The existing, approved access to the Kaizers Beach road will be used to reach the quarry site. Access to the R72 could be via the tarred Kaizer's Beach road, or via the northern extension of the Eco-Estate road located directly across the Lilyvale School. Members of the community have severe concerns regarding the use of the former road, since local residents have contributed to the upgrading of this road and it may not be designed to carry heavy loads on a continuous basis. The road surface is currently in a good state and should be maintained in this condition for as long as possible. This road should only be used if the applicant undertakes to maintain it to the satisfaction of local residents and to the current standard. The alternative road should rather be used and will also reduce the amount of heavy vehicle traffic on the Kaizers Beach road with at least 48 trips per day. This condition will be subject to an agreement with the District Roads Engineer to upgrade and maintain the road to a decent standard. Continuous heavy vehicle traffic normally results in the development of potholes over the medium term and needs to be monitored on the roads mentioned and timeous engagement with the DRE on this matter must take place to implement the required remedial measures.

Access to the Kaizer's Beach Road is via an approved Bell Mouth structure and deterioration of the access is not readily expected. If upgrading becomes necessary, it will be done in conjunction with the Department of Roads and Transport. Line of sight in both directions is good and the safety impact is rated low-moderate considering the amount of trips involved and the low-medium traffic load that the road carries.

Line of sight to the east

Line of sight to the west



Access to the proposed quarry will be along the Eco-Estate road. The chairman of the Estate objected to the use of this road, but it needs to be emphasized that the road was constructed on the Holdstock property and therefore have the right to use this road, provided that it is maintained to the same standard.

The road currently displays substandard wearing course and must be properly upgraded to facilitate hauling of sand. Traffic flow on this particular road will increase substantially and might impact on residents of the Eco-Estate once their houses have been built. Very little can be done to reduce this impact accept for construction of pass by areas every 300m and implement courteous driving. Taking into consideration that the Eco-Estate will be a low density development, the impact on traffic flow would be very low. An alternative access via the Seavale Residential development is possible, but will impose a moderate-high impact on these residents since hauling will take place through the residential area and should rather be avoided. This road will only be used as an emergency road should the Eco-Estate road become inaccessible.

Drivers will have to be sensitized on safety procedures, but since the applicant is a well known quarry operator, drivers of the company should be already skilled in this regard. 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 very high hauling rates, a flagman should secure the access.

Eco-Estate road with transformed land to the west and visuals to north-west

The upgrading of all roads rests solely the District Road Engineer (DRE) for the central region and he should therefore be kept informed on the status of the wearing course of the roads mentioned, to ensure timeous resurfacing or addressing edge breaking or structural damage. The applicant is therefore not authorized to perform upgrading of roads, unless with the permission of the DRE.

The impact of hauling on the N2 is rated low considering the contribution to the overall freight that is hauled on this road. The impact of hauling on the Kaizers Beach road is rated moderate considering that the road may not dispose of an adequate surface structure. The impact on the alternative access to the N2 is rated very low since the road is generally not used by the residents of the area. The impact on the Eco-Estate road will be moderate and continuous upgrading will be required to ensure that residents of the Eco-Estate are not affected. Liaison with the chairmen should take place on a regular basis and the owner of GVY TRADE needs to inspect this road on a weekly basis.

Cyclists and pedestrians on the roads concerned are a given and they will experience a similar risk as motorists. Drivers of haul trucks should be sensitized on the matter and provided with the necessary training, if necessary. The use of the alternative road is strongly advised.

The R72 is a single lane surfaced road with adequate shoulders and is in good condition and has been constructed to carry heavy loads. If vehicles are not overloaded, the impact on the road is rated of low significance. It is understood that some accidents have occurred in the past at the turnoffs and that heavy vehicles slow down traffic. It is therefore important that the shoulders of this road be used when turning off or onto the road to prevent hampering of traffic flow or causing accidents.

Road safety for motorists is of importance and truck drivers will be informed accordingly and be sensitized towards displaying proper road etiquette. Development of the quarry will result in increased safety risks and traffic impact due to the amount of trips anticipated per day. This impact is rated of low-moderate significance.

Access to Seavale residential area

Access to Eco-Estate road with Lilyvale School

Traffic Impact

	OPERATIONAL (no mitigation)	*WEIGHT*	*OPERATIONAL (with mitigation)*	*WEIGHT*	*CLOSURE*	*WEIGHT*
Extent	Local	2	Local	2	Local	2
Duration	Medium Term	2	Medium Term	2	Short Term	1
Intensity	Moderate	4	Low-Moderate	3	Low	2
Probability	Definite	4	Likely	3	Probable	2
Status	Negative		Negative		Positive	
Confidence	Medium		High		High	
Significance	**Moderate**	**32**	Low	21	Very Low	10

Remedial measures to be implemented are

- 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.
- Before entering the roads mentioned, vehicles will come to a complete stop and any transgressions in this regard will be heavily penalized. All contractors, if any, will sign a letter of agreement to this effect. 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 has been contravened.
- Hauling of material will not take place during the period 30 minutes before and 15 minutes after school commences and the period 15 minutes before and 30 minutes after the school closed.
- No vehicles may park outside the gate providing access the mine area, in order not to impact on the traffic flow to the Eco-Estate. It will be included in an environmental awareness programme.
- The appropriate signage (W107 & W108 –1,2m size) will be erected on both sides of the entrance to the quarry along the Eco-Estate road and both sides of the access to the Kaiser's Beach Road. The Eco-Estate Road will be maintained on a regular basis, in collaboration with the District Roads Engineer and to the satisfaction of the Eco-Estate residents. No rutting may be caused by trucks during wet periods. Regular meetings should be convened with the chairman of the Eco-Estate to deliberate the impact of the quarry and find solutions to impacts not properly controlled.

- District Roads Engineer will be consulted timeously on the maintenance of the Kaizers Beach Road if an agreement can be reached with local residents to use this road.
- If poor visibility or slow access of vehicles onto the Kaizers Beach Road or R72 could result in any accidents, a flagman will be used at these accesses.
- The internal haul road must be upgraded with a weathered dolerite wearing course before mining commences to reduce dust liberation into the air, prevent erosion and maintain safety standards.
- The Eco-Estate road will be provided with drains that can withstand the impact of continuous hauling and the road must in general be monitored for erosion and degradation.
- Gates to the property will be locked after hours.
- All loads will be covered with tarpaulins to prevent sand blasting of motorists driving behind trucks.

SOCIO -ECONOMIC IMPACT

Sand is currently in high demand and this scenario will remain until at least 2010 which is influenced by the current economic growth of the Eastern Cape, which is in turn fuelled by the development of the East London IDZ, construction activities linked to housing schemes and new businesses and the World Cup Soccer event. The sand quarry will over the short term play an important role in the development of East London infrastructure, especially taking into consideration the shortage of commercial sand quarries in the area. It is predicted that a severe shortage of sand will be encountered in the immediate future due to limited remaining reserves at existing commercial concerns, hence the development of the proposed quarry will be of extensive value to the building sector. In addition, the quarry will maintain a number of jobs at GVY TRADE and must be seen as a positive contribution to social upliftment of workers during the current economic downturn. Establishing the concern will definitely result in certain downstream employment and other spin-offs in the building industry or maintaining such economic activities.

The establishment of the concern will have a limited impact on agricultural activities, but a significant positive financial impact on the landowners during a time that the economic viability of farming is under pressure. Financial gains will mostly be appropriated for development of the farm and will therefore have a medium term positive impact on the agricultural output of the farm. However, if the stipulated mitigation measures related to noise and dust pollution and transport impact are not implemented, the property value of the Eco-Estate residents might be affected over the short term. Considering that the estate has not yet been developed and considering that owners most certainly have not purchased these properties for speculation purposes, the impact is rated of low significance provided that the prescribed mitigation measures are implemented. It is anticipated the proposed quarry will be largely worked out by the time the Eco-Estate is fully developed.

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 of low positive significance.

Social Impact

	OPERATIONAL (no mitigation)	*WEIGHT*	*OPERATIONAL (with mitigation)*	*WEIGHT*	*CLOSURE*	*WEIGHT*
Extent	Local	2	Local	2	Local	2
Duration	Short Term	1	Medium Term	2	Short Term	1
Intensity	Very Low	1	Low	2	Very Low	1
Probability	Probable	2	Definite	4	Probable	2
Status	**Positive**		**Positive**		**Positive**	
Confidence	Medium		High		High	
Significance	Very Low	8	**Low-Moderate**	**24**	Very Low	8

Remedial measures to be implemented are

Those described under previous headings.

SITES AND STRUCTURES OF ARCHAEOLOGICAL AND CULTURAL INTEREST

These sites represent the heritage of communities and are therefore protected in terms of current legislation. There is no known natural heritage or cultural sites close to the study area. No areas of social, cultural or historic value were identified onsite and the impact is rated insignificant. Considering the fact that the study area is a grassland area, the possibility of indigenous vegetation being used by local communities for medicinal use is not anticipated.

However, the site falls within 1km from the high-water mark and fragments of marine organisms and shell middens may be hosted onsite, since the area represents the historic roaming area of the Khoi-San. According to data captured for the Amatola District Municipality, there are no structures of archaeological and cultural interest in the area. Nevertheless, Dr. Johan Binneman of the Albany Museum has been appointed to perform a phase 1 investigation which will be submitted to the DME in due course.

Although no impact is envisaged, the operators of earthmoving equipment will be informed of the company's obligation in this regard and will inform management when anything of interest is noted on the site. Operators will be informed what to look out for. SAHRA's offices in East London and if necessary, Dr. Binneman at the Albany Museum in Grahamstown, will be contacted immediately. If any object that might seem to have historic or cultural value is observed, operations will be suspended immediately and the area fenced off. In such event, a formal assessment will be conducted and operations will only continue on receipt of approval from SAHRA.

PUBLIC PARTICIPATION

The setting of the land concerned is rural and surrounded mostly by transformed private farms. Current legislation (section 27(5) of the MPRDA) requires that interested and affected parties must be consulted and as part of the public participation process the following steps were taken:

1. GYV Trade CC consulted the landowner, Mr. Holstock in writing regarding his intension to mine sand on the above mentioned property and signed an agreement to this effect. This agreement was submitted in support of the permit application and is already in DME's possession.

2. Consultation letters were sent by registered post to abutting landowners and were supported by a response form and Background Information Document. Three responses were received of which two indicated no objection to the project and one, received from the Eco-Estate, objected to the sand quarry. The concerns regarding dust, noise, devaluation of the property and impact on the road were addressed in the EMP.

At closure, abutting landowners and affected departments will be consulted on the end result of rehabilitation.

The sand quarry is located in a rural areawhich is sparsely populated with only a few residents currently within 500m from the study area, hence a limited social impact is anticipated if the stipulated mitigation measures are implemented.

CONCLUSION

A. The proposed sand quarry can be developed without causing any significant environmental or social impacts. The development will result in the landowner to receive a handsome cash injection to improve the agricultural productivity of the farm. The main requirements to be met are:

1. Soils must be protected and upgraded as specified in the report.
2. A phased mining and rehabilitation approach must be followed.
3. Windscreens must be erected to control dust generation.
4. Disturbed areas must be irrigated to control dust generation during adverse climatic conditions and to stimulate re-vegetation processes.

B. The proposed quarry can meaningfully contribute to the building industry and economic growth of East London, since the city already experiences a crisis in terms of sand availability, due to the depletion of reserves at commercial concerns. Since the quarry will be financially sustainable, it would provide ample finances for the rehabilitation process.

FINANCIAL PROVISION

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 have to rehabilitate the area disturbed in case of liquidation or abscondence of the holder.

Analysis of rehabilitation costs:

General

Tendering process & advertisement = R3000
Transport of equipment = R4000
Supervision fees and reporting = R8000
Aftercare – erosion, alien eradication, seeding/planting and monitoring = R15 000
Closure documents = R4 000

Contingencies = R10 000

Sub-Total = R44000

Mine area

Cut and fill of production faces (1:3) 590m x 3 m^3 = 1770 m^3@ R11/ m^3 = R19470
Profiling of quarry floor = R3000
Spreading of topsoil 4500 m^3 @ R7 per cubic meter = R31500
Seeding and fertilising @ R3000 per ha = R4500
Introduction of organic material=R5000
Removal of waste, scrap metal and redundant equipment etc = R1000
Erosion control measures = R5000
Removal of sand screen = R500
Remove remaining quarry debris = R500
Irrigation = R10 000
Establishment of windscreens = R15000

Sub-Total = R95470

Total = R139470

Since the quarry will be developed in three phases an initial financial guarantee to the value of R50 000 will be made available to the DME. It is proposed that the applicant submit two further trimester payments of R45,000 each in August 2010 and February 2011. If the applicant is able to implement a successful rehabilitation process, the additional payments can be reduced to two payments of R20,000 instead of R45,000. Should the applicant not be able to properly profile and re-vegetated phase 1 on completion thereof, the guarantee should be increased to R14,000 to satisfy the requirements of the DME.

UNDERTAKING: IMPACT ASSESSMENT

I, K. Freitag, representative of GYV Trade CC, declare that the above information in my opinion is true, complete and correct. I undertake to implement the remedial measures at the proposed 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 at Port Elizabeth this ..... day of ..... 20....

.....
Signature of applicant

MONITORING AND PERFORMANCE ASSESSMENT

Inspections and monitoring

- Regular monitoring of all the environmental management parameters and implementation of measures 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.
- Various compliance areas will be identified with regard to the 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 disturbed areas, re-vegetation progress, die-off of established vegetation and storm water control.

Compliance reporting / submission of information

- Layout plans will be updated annually or should mining operations change drastically, updated copies will be submitted to the DME
- Any environmental emergency/accident will be reported to DME immediately and where applicable, to DWAF/DEDEA.
- Should the assessment of environmental impacts in future be proved incorrect or should impacts have been unknown when the programme was compiled, then additional assessments will 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 DME and other relevant Departments within 12 hours.
- An annual performance assessment will be compiled and submitted to the DME in December of each year.
- Once extraction is completed, a closure program will be compiled and submitted to the DMR to ensure that rehabilitation will be completed as per the EMP and applicable environmental legislation.
- A final performance assessment report will be submitted at closure to ensure that all potential impacts have been covered, that procedures followed were in line with the conditions of the management plan and that rehabilitation has been completed in accordance with the management plan. Should any major shortcomings be detected, an amendment to the EMP/closure plan will be drafted and submitted for approval to the DME.

The following site specific monitoring will be executed

- An environmental monitoring checklist will be developed immediately after approval to facilitate a formal assessment process. It should be in line with environmental matters addressed in the EMP.
- The entire quarry will be monitored on a weekly basis until closure is granted.
- The mining/rehabilitation activities will be visited regularly by the holder/manager to ensure that mining takes place within approved boundaries, that production faces are profiled and stabilized, provided with topsoil, vegetated and fertilised and that no erosion or unauthorized dumping are taking place on site.
- That vegetation cover is adequate.
- The minimum vegetation and topsoil are removed ahead of the mining face.

- Re-vegetation process is successful and that alien vegetation is removed.
- The area will be regularly visited by the holder/manager to ensure that the handling of hydrocarbons takes place according to approved guidelines and that the necessary precautionary measures for spills are adequate. Ensure that soils are not polluted with hydrocarbons
- General waste is handled correctly and effectively removed from the property.
- Dust control on the roads and quarry is effective to limit air pollution.
- That the mine is clean and tidy.
- Should any remedial measure fail, it will be adapted to suit circumstances or alternatives 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 until the problem has been remedied and financial penalties will be imposed.

REHABILITATION SHEDULE

Quarry

- Completion of profiling of production faces of phase 1 – within 1month after mining of phase 2 has started.
- Completion of spreading topsoil within phase 1 - within 2 months after mining of phase 2 has started.
- Completion of seeding, fertilizing and application of organic matter (manure) - within 3 months after mining of phase 2 has started.
- Phase 1 must be fully rehabilitated and profiling of phase 2 completed before mining of phase 3 may commence.
- Submit a closure plan & risk assessment three months before mining operations are to cease.
- Aftercare/maintenance – Two years after rehabilitation was successfully completed.

Plant

Remove screen, if established within 1 month after mining ceased.
Remove calcrete nodules/quarry debris to excavation, if any, within 1 month after mining ceased in each phase.

General

Quarterly eradication of alien vegetation until closure certificate is issued.
Light application of fertilizers in March and September for duration of mining, rehabilitation and aftercare phases if tunnel infrastructure is not immediately established.

CLOSURE OBJECTIVES

Closure objectives will be based on the following:

- Identify the key objectives for mine closure to guide the project design, development and management of environmental objectives
- Provide broad future land use objective(s) for the site
- Provide proposed closure cost
- The mine area will be rehabilitated back to grazing land.
- Production faces of the quarry will be profiled to 1: 3 slope by cut & fill method with the top edge rounded off to create a flowing landscape. The eastern and northern faces will be levelled out and integrated with the surrounding topography
- 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.
- The rehabilitated area will be kept clear of alien and invasive plant species.
- The area would be litter and erosion free.
- There will be no remaining stockpiles, equipment, waste, scrap metal/redundant equipment.
- Hydrocarbons, and contaminated soil, if any, will be safely removed from site.
- Safe drainage of the area towards the north-east will be facilitated and no erosion will be present on the slopes.
- Wild animals will be able to safely return to the site.
- The mining site will not become prone to unauthorised dumping.
- A sustainable land-use will be achieved within 2 years after rehabilitation has been completed.
- Nearby residents will not be subjected to any post closure social or environmental impacts.

CONTENTS OF CLOSURE PLAN

Closure would be affected by the submission of the following documents to the DME 30 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 description of the closure objectives and how these relate to the mine operation and its environmental and social setting;
- A plan contemplated in Regulation 2(2), coordinated according to generally accepted standards, showing the land or area under closure;
- A summary of the regulatory requirements and conditions for closure negotiated and documented in the environmental management programme or plan;
- A summary of the results of the environmental risk report and details of identified residual and latent impacts;
- A summary of the results of progressive rehabilitation undertaken;
- 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;
- Details of any long-term management and maintenance expected;

- Details of financial provision for monitoring, maintenance and post closure management, if required;
- A plan or sketch at an appropriate scale describing the final land use proposal and arrangements for the site;
- A record of interested and affected persons consulted; and
- 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 holder of the permits will be liable for any environmental damage or degradation emanating from his operation, until a closure certificate has been 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 in March and September
- 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 March and September
- Eradication of alien vegetation – Quarterly
- Maintain windscreens – ongoing
- Irrigation of disturbed areas - ongoing

POST CLOSURE MAINTENANCE

It is anticipated that the site will be completely rehabilitated but heavy rain events, drought or extremely windy periods could affect the rehabilitated site. It is anticipated that post closure maintenance will be restricted to six-monthly eradication of invasive vegetation, addressing erosion problems and reseeding of such affected areas. In order to provide the necessary funds for this task, the following funds need to be secured:

Eradication of invasive vegetation = R4000
Addressing erosion/stability problems = R10000
Re-vegetation and fertilizing of affected areas = R5000

Total = R19000

POST CLOSURE AESTHETIC ACCEPTABILITY

The quarry will be almost completely integrated with the surrounds in terms of topography and vegetation composition. On the southern and western side profiled faces of approximately 3m high will be visible, but should be absorbed sufficiently by the topography of the area if the northern and eastern faces are levelled out and integrated with existing contours. If these remedial measures are implemented, it will resemble a situation where the current steep slope on the northern side of the dune

is pushed back towards the coast and would visually be acceptable and hardly noticeable. The landscape will be re-vegetated back to grassland and since no major change in landform will take place, it will resemble similar landforms occurring in the surrounding area. From an aesthetic point of view, the landscape will have a marginally poorer visual quality, but this situation will be turned around within a few years when vegetation maturity has been achieved. Since the site is not readily visible from abutting properties or roads, changes in aesthetic quality will not be easily noticed, except from the Seavale development, southern section of the Eco-Estate Road and possibly from a few residences on the eastern perimeter of the Eco-Estate. It is anticipated that with the re-vegetation approach to be followed, the texture and colour of the vegetation will match that of abutting land within 2 years time.

If rehabilitation is not afforded adequate time and finances, the above assessment will change dramatically and a much degraded landscape can be expected that will definitely pose a social impact and result in very poor visuals and poor quality landscape.

LEGAL PROVISIONS

Compliance with the provisions of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) and its Regulations does not necessarily guarantee that holder is in compliance with other Regulations and legislation. Other legislation that will be observed includes, but are not limited to:

* National Monuments Act, 1969 (Act 28 of 1969).
* National Parks Act, 1976 (Act 57 of 1976)
* Environmental Conservation Act, 1989 (Act 73 of 1989)
* National Environmental Management Act, 1998 (Act No. 107 of 1998)
* Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)
* The National Water Act, 1998 (Act 36 of 1998)
* Mine Safety and Health Act, 1996 (Act 29 of 1996)
* The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).

I, K. Freitag, representative of GYV Trade CC, take cognisance of the following penalties should I transgress any section of the MPRDA or any other Act governing any other activity on the two quarry sites or any condition of the EMP and will abide thereby.

Section of Act	Penalties for failure to comply with the provisions of the MPRDA 28 of 2004	Penalty in terms of Section 99
5(4)	No person may prospect, mine, or undertake reconnaissance operations or any other activity without an approved EMP, right, permit or permission or without notifying land owner	R 100 000 or two years imprisonment or both
19	Holder of a Prospecting right must: lodge right with Mining Titles Office within 30 days; commence with prospecting within 120 days, comply with terms and conditions of prospecting right, continuously and actively conduct prospecting operations; comply with requirements of approved EMP, pay prospecting fees and royalties	R 100 000 or two years imprisonment or both
20(2)	Holder of prospecting right must obtain Minister's permission to remove any mineral or bulk samples	R 100 000 or two years imprisonment or both
Section of Act	Legislated Activity/ Instruction/ Responsibility or failure to comply	Penalty in terms of Section 99

26(3)	A person who intends to beneficiate any mineral mined in SA outside the borders of SA may only do so after notifying the Minister in writing and after consultation with the Minister.	R 500 000 for each day of contravention
28	Holder of a mining right or permit must keep records of operations and financial records AND must submit to the DG: monthly returns, annual financial report and a report detailing compliance with social & labour plan and charter	R 100 000 or two years imprisonment or both
29	Minister may direct owner of land or holder/applicant of permit/right to submit data or information	R 10 000
38(1)(c)	Holder of permission/permit/right MUST manage environmental impacts according to EMP and as ongoing part of the operations	R 500 000 or ten years imprisonment or both.
42(1)	Residue stockpiles must be managed in prescribed manner on a site demarcated in the EMP	A fine or imprisonment of up to six months or both
42(2)	No person may temporarily or permanently deposit residue on any other site than that demarcated and indicated in the EMP	A fine or imprisonment of up to six months or both
44	When any permit/right/permission lapses, the holder may not remove or demolish buildings, which may not be demolished in terms of any other law, which has been identified by the Minister or which is to be retained by agreement with the landowner.	Penalty that may be imposed by Magistrate's Court for similar offence
92	Authorised persons may enter mining sites and require holder of permit to produce documents/ reports/ or any material deemed necessary for inspection	Penalty as may be imposed for perjury
94	No person may obstruct or hinder an authorised person in the performance of their duties or powers under the Act.	Penalty as may be imposed for perjury
95	Holder of a permit/right may not subject employees to occupational detriment on account of employee disclosing evidence or information to authorised person (official)	Penalty as may be imposed for perjury
All sections	Inaccurate, incorrect or misleading information	A fine or imprisonment of up to six months or both
All sections	Failure to comply with any directive, notice, suspension, order, instruction, or condition issued	A fine or imprisonment of up to six months or both

ACKNOWLEDGEMENTS

Department of Water Affairs – Environmental Data
Department of Environmental Affairs – Environmental data
Amatola District Municipality – Amatola State of the Environment Report.
SM Pierce & AD Mader - STEP Handbook
SANBI – Environmental data & maps

UNDERTAKING

I, K. Freitag, representative for GYV Trade CC and 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 ..... 20...

.....
Signature of applicant

.....
Designation

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…….....20....

.....……..
REGIONAL MANAGER
EASTERN CAPE