

The Yellow-bellied house snake (*Lamprophis fuscus*) is associated with the mountainous and grassland areas of the Eastern Cape Province and is a pale olive colour with a light yellow belly. The snake is secretive and nocturnal, occurring in old termitaria and beneath stones. This species is considered rare, and could occur with the study area.

South Africa has been spared the scourge of introduced reptiles and amphibians. A number of commensal geckos have occasionally been introduced into the Eastern Cape from adjacent regions.

MAMMALS

Of the 292 terrestrial mammal species in southern Africa, 128 occur in the Eastern Cape Province. Most of the larger species occur in game reserves, and only the smaller mammals could occur in the study area. No mammal species was noted on the day of inspection and recent investigation did not find any snares or people with packs of dogs, which might indicate that either all the animals have been hunted, or that poaching is now controlled at this site.

Species listed as vulnerable in the Red Data Book that can possibly occur in the study area is the White-tailed Mouse (*Mystromys alibicaudatus*), Honey Bager (*Mellivora capensis capensis*), African Wild Cat (*Felis lybica cafra*), and Antbear (*Oryceropus afer afer*). Rare species occurring in this region, and listed in the Red Data Book, include the Speckled Dormouse (*Graphiurus ocellatus*), African Striped Weasel (*Poecilogale albinucha albinucha*), Aardwolf (*Proteles cristatus cristatus*), Serval (*Felis serval serval*), Tree Dassie (*Denrohyrax arboreus arboreus*), and Blue Duiker (*Philantomba monticola monticola*). Occurrence of these species in the study area is, however unlikely, as human activity levels are fairly high and the natural habitat has generally been destroyed.

BIRDS

The grassy plains in the area, which are still vegetated with indigenous grasses, play an important role in the biology of certain bird species like the francolin, guinea fowl, quail, bustard, korhaan, chat and plover to name a few.

SITE SPECIFIC

During the site visit no animal was noted, but this does not mean that no animal occurs on site. Mining would be restricted to limited areas 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 and blasting will cause most animals to vacate the site on a temporary basis. If certain species were to be affected they would simply vacated the proposed mining areas during the day and return during the night and over the weekends. The impact could be rated as very low due to the number of animals and species that will be affected.

Subject to that animals are not disturbed or 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 number of people communicating with each other and from the excavator, trucks, crushing plant and screen as well as occasional blasting. Noise levels are anticipated to range between 55 and 70 decibels at the mine boundaries. Most of the noises would be low-pitched and would have a lesser impact on animals than what high-pitched noises would have, besides the blasting. Hearing systems of animals are much more sensitive to the latter. Should animals found themselves on site the slow development process would also provide ample time for all species to migrate to abutting areas. Blasting will have the biggest impact on the animals in terms of noise. The site must be walked over and cleared of any animals before blasting may commence. Animals not found on the mining area will flee when blasting occurs and no impacts are expected. It was proved in game reserves that after a while animals could coexist with vehicle movement with indifferent neutrality.

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

Limited hydrocarbon spillages would not detrimentally affect fauna on site. In addition, storage of hydrocarbons and the servicing of vehicles will be done off site. Since there are very few remaining wild mammals on site, which may be due to the encroaching urban development and illegal hunting, no detailed faunal survey was conducted.

During the operational phase, the impact of mining on fauna is rated low. Rehabilitating the quarry site would provide an improved ecological niche and the opportunity for animals to re-colonize the area. The impact at closure is rated to be of low positive significance.

Impact on Fauna

	OPERATIONAL (no mitigation)	OPERATIONAL (with mitigation)	CLOSURE
Extent	Local	Site Specific	Site Specific
Duration	Medium Term	Short Term	Long Term
Intensity	Low	Low	Low
Probability	Likely	Possible	Definite
Significance	Low	Low	Low
Status	Negative	Slightly Negative	Neutral
Confidence	High	High	High

REMEDIAL MEASURES

- Handling of fuels will be in accordance with all applicable legislation to prevent pollution incidents.
- Movement of vehicles will be restricted to the authorized mine area.
- No animals entering or settling in the mine area will be disturbed or killed and this requirement will be included in the environmental awareness programme, which must be discussed with workers on an annual basis by the owner of the proposed quarry but preferably by a competent environmentalist.
- No hunting or snaring would be allowed outside or inside the mine area and the applicant will implement a severe penalty system for people transgressing this requirement. In addition, the owner or manager will remove any of the staff caught interfering with wildlife from the site immediately.
- All animals found on working areas where they may be injured, will be relocated to areas outside the mine area.
- Nesting sites will be temporarily excluded from the mine area or be carefully relocated.
- Areas to be cleared will be swept before vegetation is removed. Relocate any herpetofauna and slow moving animals to areas outside the mining areas in an unharmed manner.
- Disturbed areas will be properly rehabilitated as per the process outlined in the re-vegetation programme.

- Veld fires will be prevented by not allowing any open fires in the mine areas or smoking outside the mine areas.
- Mining area will be clearly demarcated and areas outside it will be out of bounds.
- Production faces will be profiled properly to ensure that it does not hold any danger to animals and to facilitate proper re-vegetation.

WATER

SURFACE WATER

The catchment (area 1395ha) is bordered on the north and west by the easterly extremities of the Groot Winterhoek mountains and rapidly descend from here to the coastal plains of Port Elizabeth. The catchment consists of four tertiary catchments. The two main channels that join to form the Swartkops River arise in two clearly demarcated sub-catchments, the Elands to the southwest and the Kwazungu to the north but both originate in the Groot Winterhoek Mountains. Multiple, narrow, well-watered ravines are found in Kwazungu but the Elands is much drier and those tributaries draining from north to south usually flow throughout the year. The Brak and the Chatty Rivers originate in the plains to the north of Port Elizabeth and join the Swartkops River below the confluence of the Elands and the Kwazungu. Within the wider catchment area there are four smaller river systems, the Bakens River, Van Stadens River, the Shark River and the Maitland River, that drain directly into the sea. Only the Van Stadens River contributes water to Port Elizabeth from three dams with a total capacity of 0.643 106m³. However some of these dams are severely silted (staff of Nelson Mandela Metropole *pers. comm.*) and consequently the capacity cited will have been compromised.

A drainage feature occurs to the north and south of the site. Currently, the study area is drained by means of velocity sheet wash, draining into these two drainage features. Taken this into consideration, the mine development will not impact these drainage systems, since during and after the development, the site will not be free draining. Mining will also not impact on any river system or dam due to the very far distance from any surface water.

Potable water will be brought to site and will not exceed 1,5m³ per week. If it is required to irrigate vegetated areas during extreme dry periods and dust suppression, consumption will not exceed 30m³ per week and will be obtained from the Municipality.

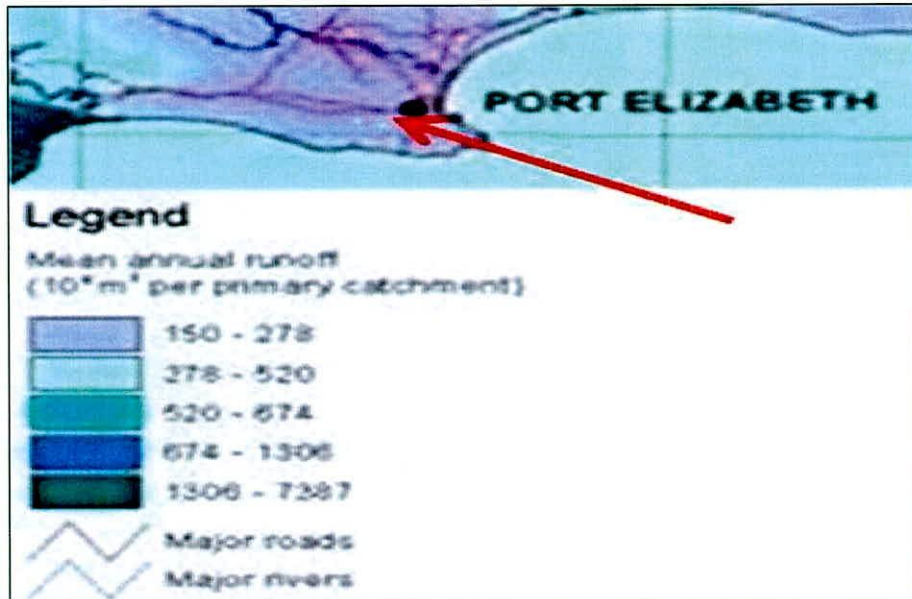


Figure 24: Primary Catchment runoff

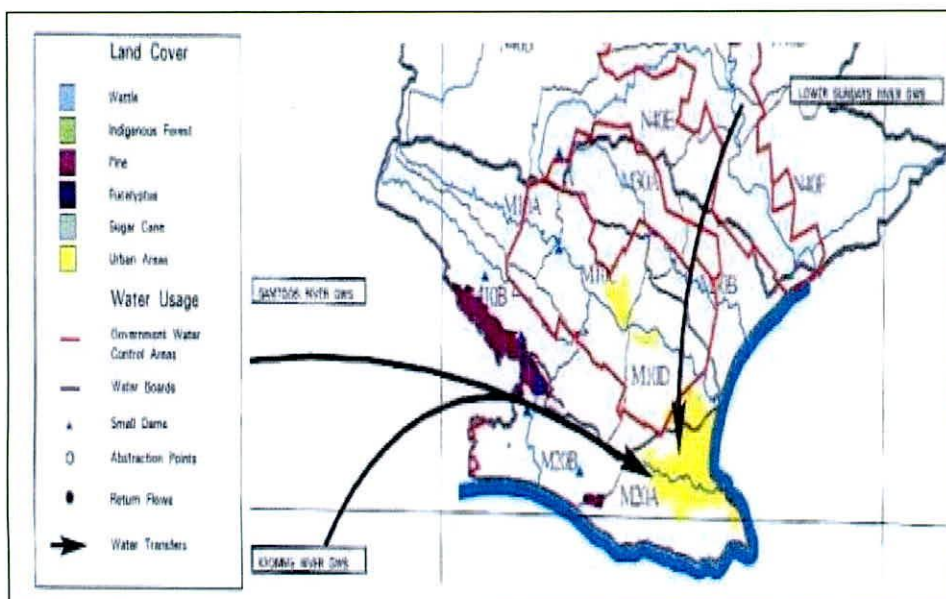


Figure 25: Water usage

Impact on surface water

	OPERATIONAL (no mitigation)	OPERATIONAL (with mitigation)	CLOSURE
Extent	Site specific	Site specific	Site specific
Duration	Short Term	Short Term	Short Term
Intensity	Low	Low	Negligible
Probability	Low	Very Low	Insignificant
Significance	Negative	Slightly Negative	Neutral
Status	High	High	High
Confidence	Site specific	Site specific	Site specific

GROUNDWATER

The Table Mountain Group form secondary aquifers in which groundwater flow is stored within fractures 20-30m underground in the high lying area but are closer to the surface in lower lying areas such as at Perseverance. Groundwater flow is from the west to the east toward the sea. This is an extensive aquifer and is accessed from as far west as Humansdorp and Jeffreysbay in the immediate vicinity. Boreholes to utilize ground water in Port Elizabeth appear to be confined to the more affluent areas (cost related) and are primarily used for gardening. The outlying area groundwater supplies all water to households that fall outside the municipal reticulation system. Most borehole water appear to derive from the secondary aquifer (except in Summerstrand close to the coast) if the depth of the holes are considered (Lomberg *et al* 1997).

The site is underlain by highly fractured quartzitic sandstone, which is known as a fairly good aquifer in this region.

These perched water tables generally occurred within the loose gravelly ferricrete horizons, or at the completely weathered /high weathered quartzite sandstone interface. Water seepage rates are generally slow to moderate and contamination, if any, should be non-hazardous.

The occurrence of ferricrete and gleyed material (both of which can only form under, or as a result of perched water table activity), indicates the presence of perched water tables in the area from time to time, especially after periods of heavy or prolonged precipitation. These perched water tables will be more prominent in the lower lying areas and depressions.

However, the depth to the permanent water table appears to be about 80 m below surface in this area, and bedrock is capped by the fairly impermeable gleyed clay and completely weathered rock barrier. The permanent and perched water tables are separated by the colluvial / weathered residual material zone, which forms an aquiclude.

Mining activities will not have any negative or positive impact on the groundwater, since mining will not intercede any groundwater table. Thus impact on the groundwater can be rated as insignificant.

GROUND WATER QUALITY

SEWAGE FACILITIES

The proposed chemical toilet will not cause an increase in coliform levels of perched aquifers as well as the main aquifer because of the reason provided above. It needs to be taken into account that the effluent stream would not exceed 0,1 – 0,5m³ per week, the impact would be negligible. The main aquifer is located within the Table Mountain Sandstones, which will be protected through the fairly impermeable gleyed clay and completely weathered rock barrier.

HYDROCARBONS

No hydrocarbon storage or draining would take place within the mine area therefore a negligible impact is anticipated. In addition, absorption capacity of the soil will further negate minor leaks. Vehicles will also not be cleaned onsite. It should also be recognized that hydrocarbons are biodegradable and small spills will quickly be naturally remedied

WASTE

The mining site will host 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. 'Industrial waste' will be restricted to scrap metal and machine parts, which will not be stored and immediately 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

No groundwater will be used.

Impact on ground water quality and reserves

	OPERATIONAL (no mitigation)	OPERATIONAL (with mitigation)	CLOSURE
Extent	Local	Site Specific	Site specific
Duration	Short Term	Short Term	Short Term
Intensity	Low	Low	Negligible
Probability	Possible	Unlikely	Definite
Significance	Very Low	Insignificant	Insignificant
Status	Slightly Negative	Slightly Negative	Neutral
Confidence	High	High	High

REMEDIAL MEASURES

- Chemical toilet will be maintained to Municipal specification, will be inspected on a regular basis and be located within the excavation.
- The excavation will not be free draining and runoff from the production faces will be trapped in the concentration/silt dam in the eastern corner of the excavation, which will act as a silt trap.
- The silt dam will be retained until closure is granted and if necessary it must be cleaned and the material used in the rehabilitation process.
- Production faces will be protected against erosion to prevent increased overland silt transport by means of a berm upslope of production faces diverting clean runoff to the north and south.
- No storage of hydrocarbons will take place onsite.

- Mining will be restricted to the proposed depth and footprint.
- 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 outside the mine area.
- Vehicles will not use alternative roads or damage vegetation outside the approved mine boundary.
- Waste will be contained in receptacles stationed at appropriate areas within the excavation and be removed from the quarry area on a weekly basis or whenever necessary. No household or industrial waste will be burnt or buried on the site.
- Refueling of vehicles will be done offsite.
- Only emergency repairs will take place within the mining area and must be done over a drip pan.
- Vehicles/equipment shall be maintained to a high standard and shall not display any major leaks.
- Any contaminated spares, oil filters and gaskets will be placed in a suitable receptacle and immediately removed from the property to an approved facility.
- If spills do occur, the affected soil will be removed to an approved waste site. Super absorbing material such as Peatsorb or Spillsorb or alternatively sawdust will be kept onsite and used to contain any potential spills.
- In case of large, critical spills the Departments of Water Affairs and DME will be informed immediately for assistance and advice and a competent company conversant with bio-remediation will be appointed as soon as possible to address the possible impacts of such spill. All costs would be for the account of the applicant.
- Management will not entertain hydrocarbon spills on site and where necessary, financial penalties would be imposed on workers in cases of negligence.
- No hydrocarbons or hydrocarbon-contaminated material/parts will respectively be drained in the soil or buried on the property.
- All dysfunctional equipment and vehicles will be immediately removed from site.
- The applicant accepts the principle of 'polluter pays'.

AIR QUALITY

The amount of dust generated on a mining area is directly linked to the type of material that is extracted, mechanical processes involved, traffic volumes, wind speed and soil moisture content. The finer the material (more easily airborne) and the higher the clay and silt concentrations the more severe is the impact. The dryer the soil becomes the more dust it generates therefore topsoil must be replaced, seeded and irrigated as soon as possible. As an alternative it could be covered.

The air quality at this site is highly influenced by the activities surrounding the site. Very high plums of dust are generated on the hard rock quarry next to the study area, together with an increase in smoke generated by household fires and vehicular emissions of by passing traffic and machinery of the quarry and other development sites. During windy periods the un-rehabilitated mining areas to the south, liberate a limited amount of dust into the atmosphere causing a slight rise in air pollution levels. All these factors contribute to a fairly mediocre air quality of the area. Since the property involved is still zoned agricultural and semi-wilderness, it would cause tolerable ambient levels to be higher than those for residential areas. It would on the other hand not exempt the applicant to implement measures to keep disturbed areas as small as possible and to reduce dust generation when and wherever possible.

The silt content of the quartzite deposits is fairly high and would cause excessive dust when handled. Since there will be a crushing plant onsite, dust levels will be elevated. The dust from the crushing plant and stockpiles may also pose health problems especially to the workers. The applicant and workers must comply with Mine Health and Safety guidelines, thus mitigating these potential health risks. On the other hand, the site is situated north from the closest residence (Greenbushes), thus the predominant south-easterly winds, that mostly blow in this region, would blow the dust away from the residents most of the time and no health or discomfort (like dust fall out) impacts will be expected. Dust generation however must still be mitigated and the area can simply be irrigated once or twice per day. A sprinkler system must also be installed on the crushing plant and be used whenever the crushing plant is operating. The fact that there are no people residing immediately close to the mine negates this impact to some extent.

Mechanical processes are: mining, blasting, loading and pulverizing of quartzite; hence dust generation during normal climatic conditions would be fairly high. The strong winds of the Port Elizabeth may during dry periods (which are quite frequently experienced) liberate vast amounts of dust particles from the quarry into the atmosphere and may cause deposition of large amounts of dust, but as indicated previously no residence are close by and this impact may be negligible.

As previously indicated, if dust generation does become a problem, the area can be irrigated once or twice per day. However, during extreme climatic conditions, it is expected that dust generation would be moderate-low. During crushing however, the sprinkler system must be fully operational at all times.

Being zoned an agricultural area; it would also be marginally acceptable to experience small quantities of windblown dust every now and then. It does, however not exempt the applicant to

implement measures to keep disturbed areas as small as possible and to reduce dust generation from topsoil and crushed material stockpiles.

No more than 10-20 truckloads would be carted from the property per day resulting in vehicle movement approximately every 15-30 minutes. Since dust generation is also determined by speed in conjunction with axle number it is imperative, that the contractor reduces haul speed to 40km/h and enforce that strictly. The author is confident that very little dust will be deposited at any residence and if such deposition occurs it will be below 20-30mg/m² per day. If need be, dust levels could be determined to ensure that dust counts are below DEA requirements.

People struggling with acute allergies for dust could be marginally affected. In the authors opinion pollen from the numerous alien trees in the greater area (Acacia species) would play a far more pronounced role. It would therefore be unfair to single out the proposed quarry as the sole perpetrator for causing allergies although it could cause a limited cumulative impact. With any rain, dew, or mist, which the area is frequently exposed to, the dust liberated into the air will decline drastically. In terms of the Mine Health and Safety Act, the silica content can be established to determine whether any special precautionary measures are required.

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

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

Impact on air quality

	OPERATIONAL (no mitigation)	OPERATIONAL (with mitigation)	CLOSURE
Extent	Local	Local	Site Specific
Duration	Long Term	Short Term	Short Term
Intensity	Moderate	Low	Negligible
Probability	Highly Likely	Likely	Unlikely
Significance	Moderate	Low-Moderate	Low
Status	Negative	Negative	Neutral
Confidence	High	High	High

- 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 disposed off on site.
- Waste will not be burnt on site. Waste will be retained in proper receptacles placed at the western boundary of the site and removed regularly to an approved waste site. The waste stream will be limited and be removed from site weekly to prevent odours from occurring.
- The mine will be developed in phases to reduce the extent of exposed areas.
- Topsoil will be reintroduced to mine areas as soon as possible and irrigated immediately after placement.
- The chemical toilet shall be regularly serviced as per Municipal guidelines.
- Disturbed areas will be watered down by means of a sprinkler system or water cart. Equipment for this purpose must be obtained as soon as possible on approval of the EMP. If needed, shade cloth windbreaks (10m apart, 2,5m high) will be erected.
- A sprinkler system will be installed on the crushing plant and utilized when crushing takes place to eliminate crushing dust fall out.
- Should the service road liberate unacceptable dust volumes into the air a sprinkler system will be erected along applicable sections of the road.
- Stockpiles will be retained in the mining area, kept as small as possible and be watered down to mitigate source of dust.
- Handling of material during periods of high wind action will be avoided as far as possible if it leads to unacceptable dust generation. Should irrigation be ineffective during such adverse climatic conditions quarry operations shall cease. The management system will allow for monitoring the situation over weekends when no workers are on site.
- Speed of vehicles will be restricted to 40km/h.
- Mine Health and Safety guidelines must be implemented by applicant and workers.

NOISE

The impact of noise levels generated by mining activities is determined by the time of day, the consistency thereof, distance to people, whether it is a low or high-pitched noise and whether beneficiation is taking place. Noise levels are more intense in the morning and evening than during the rest of the day and are more irritating if it is high pitched. The more continuous the noise is the

higher the impact. In terms of SABS standards noise levels for rural residential areas are 45 dB during the day, 40 dB in the early evening and 35 dB at night. Noise impact is rated against the following: 1) The average person will be able to just detect a noise increase of 2 dB, 2) An increase in noise levels between 2-5 dB will result in no or sporadic complaints from communities whilst an increase between 5-10 dB 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 7 dB, and 4) An average person will perceive such an increase in the ambient noise levels as a doubling of noise levels and very strong response will be expected from communities/residents.

The rural nature of the area involved would cause the ambient noise levels on average to be below 30 dB. The Mission Road adds to noise levels due to traffic volumes, including the existing quarry and associated activities. Taking into account that this is also a farming community which has already be highly impacted on through urban development, a slight increase in noise levels during the day, at the mine, would be acceptable and most likely unnoticeable. However, in order not to cause any unacceptable disturbances, noise levels at the mine boundary should be kept below 60 decibels during the day (excluding blasting activities), which would be well within reach of the machinery and trucks used in the mining process, provided that they are well maintained. Sources of noise will be the excavator and trucks at the mine area and noise levels will be raised to between 60dB and 75dB at source. Within 100m from the quarry, noise levels will abate to approximately 50-60dB and within 200m to approximately 50dB. Noise levels at the nearby residence will therefore not be raised by more than 5dB. Blasting will be limited to once a week and would elevate noise levels. However low charge explosives can be used. It must be taken into consideration that blasting creates a once-off spike in noise generation. It is not a constant frequency of noise and considering the long distance from any nearby residence this impact is rated low. In addition, Afrimat and Scribante Quarries perform blasting on a regular basis and to date no complaints have been received from residence.

The crusher that would be hosted onsite could also add to the noise impact but is rated a low impact due to the distance from any nearby residence. Work over weekends may cause a noise nuisance and should be limited from 8am to 1pm on Saturdays.

Seeing that no camp would be established on the mining area, no noise would be generated at night that could become a nuisance. Working hours would on average be from 7 am to 5 pm on weekdays, which would coincide well with the daily activities of the inhabitants of the area.

Adverse conditions such as low cloud cover or strong winds blowing towards recipients could increase noise levels between 3 & 7 dB, but considering the residence not being in the wind path, the impact is still rated of low significance.

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 40 km/h would assist in curbing noise impact. Exercising proper road etiquette is still vitally important to maintain low noise levels.

With the necessary mitigation measure in place, the all-over impact can be rated as intermittent and low and should rather be rated as a nuisance.

Noise Impact

	OPERATIONAL (no mitigation)	OPERATIONAL (with mitigation)	CLOSURE
Extent	Local	Local	Site Specific
Duration	Short Term	Short Term	Short Term
Intensity	Low	Low	Negligible
Probability	Likely	Likely	Unlikely
Significance	Low-Moderate	Low	Insignificant
Status	Negative	Negative	Neutral
Confidence	High	High	High

REMEDIAL MEASURES

- All vehicles will be fitted with standard exhaust systems and be regularly serviced.
- Unnecessary hooting, shouting, flapping of tailgates and use of exhaust brakes will be discouraged and be penalized where necessary.
- Unnecessary idling of vehicles will be discouraged.
- Traveling speed on the internal haul road will be reduced to 40km/h
- Normal working hours will apply for weekdays (7am-6pm in summer and 7.30am-5pm in winter) and Saturdays (8am-1pm) if necessary (will liaise with property owners) – No work on holidays or Sundays.

- Workforce and contractors will be properly managed in terms of noise generation and be informed on acceptable behavior.
- Protective ear devices will be provided to all operators of machinery/vehicles generating noise above 50dB at source.
- Vegetation screens outside the mine area will not be removed.
- Blasting will occur no more than once a week.
- Only low charge explosives may be used and neighboring residence must be notified a week in advance when blasting will occur.
- All Mine Health and Safety guidelines must be complied with.

WASTE GENERATION AND MANAGEMENT

BUILDING RUBBLE

No construction activities will take place therefore no cement residue, brick residue, corrugated plate off-cuts, ceramic waste or PVC residue would be generated. There will be no office or workshop on the mine area. At closure there will be no infrastructure to be removed.

There will be a mobile crushing plant on the mine area. At closure there will be no infrastructure to be removed. No 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 piece dysfunctional equipment, which will be removed from the property on a daily basis. No impacts on soils, water vegetation, air quality and humans are anticipated.

DOMESTIC WASTE

The waste stream will consist mainly of domestic waste (food, bottles, plastic bags, paper, clothing, rags etc) and will be small and deposited in the containers provided for this purpose. Refuse bins will be clearly marked and placed at the entrance to the property 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. Due to the limited number of people

anticipated on site, the limited waste stream will have negligible impacts on soils, water vegetation, air quality and humans.

MINE RESIDUE

The geology of the area restricts the type of residue to oversize boulders and root mass. The former will be returned to the excavation and be covered with gravel on a weekly basis whilst the latter will be stockpiled and worked into the topsoil as organic matter. Since no chemical processes, mineral processing or washing plant is required on site no chemical/mineral waste or effluent is generated.

The cumulative impact on soils, water quality, stream flow, vegetation, and aesthetics is rated of low significance.

SEWAGE SYSTEM

The sewage system will consist of a chemical toilet and due to the limited number of people on site, the effluent stream will be limited to approximately 0,1- 0,5m³ per week and no impacts on soils, groundwater, surface water, air and humans are anticipated.

HYDROCARBONS

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

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

SALVAGE YARD / SCRAP METAL

The site will host a mobile crushing plant, thus the spare parts and hence scrap metal that will be generated will be stored at an allocated salvage yard within the mining area. It will be kept neatly and

if needed fenced off. All unusable equipment will on a monthly basis be disposed of at an appropriate recycling facility. The impact on soils, water quality and aesthetics is rated low.

At closure, any scrap metal and dysfunctional equipment that might be positioned onsite, will be sold to a commercial scrap yard. No post closure impact is anticipated.

It must be noted that since the mining area is situated fairly close to an illegal dumping site, strict control must be practiced by the applicant/landowner, as well as the DME to not allow illegal dumping to take place at this mining quarry. If no control is implemented, the risk of illegal dumping at this site will be high.

Impact of waste on environment

	OPERATIONAL (no mitigation)	OPERATIONAL (with mitigation)	CLOSURE
Extent	Local	Site Specific	Site Specific
Duration	Short Term	Short Term	Short Term
Intensity	Low	Low	Negligible
Probability	Moderate – if illegal dumping is not controlled Low – if illegal dumping is controlled	Very Low	Insignificant
Significance	Negative	Negative	Neutral
Status	High	High	High
Confidence	Local	Site Specific	Site Specific

REMEDIAL MEASURES

- The odd tyre casings and dysfunctional equipment that could be generated, will be disposed of immediately at the nearest registered waste facility.
- All machinery and waste, if any will be removed at closure.
- Any waste produced will be removed from the mine area on a continuous basis to the nearest waste facility with specific emphasis on household waste, plastics, unusable scrap metal and tire casings, if any.
- At closure, all waste will be removed from site.
- Vehicles may not leak any fuel, oil or lubricants and will be maintained to an acceptable standard offsite.

- Any fuel spills will be cleaned up immediately and the soil from spill areas to be removed to the waste disposal site.
- A chemical toilet will be placed at the quarry and it will be regularly serviced and emptied at an approved waste site. A Health Inspector should inspect the system and surrounds annually.
- Strict controls will be enforced to ensure that the surrounds are not use as ablutions and this aspect would be included in the environmental awareness programme.
- Strict control must be enforced to ensure that the mining area does not become an illegal dump site. This can be achieved by locking the gate to restrict access to the site.
- Domestic waste generated ancillary to the mining process will be deposited in containers with scavenger proof lids placed at quarry. It will be weekly removed from site to the nearest waste site and not dumped in the veld. Containers will be clearly marked to ensure that they are used for the right purpose. Management will provide clear management guidelines and this aspect will be included in the environmental awareness programme, if needed.
- Waste will not be burnt or buried on site.
- Staff will be equipped to distinguish between domestic waste and industrial waste.
- No day to day repairs or servicing of vehicles or equipment will take place on site.
- All hydrocarbon-contaminated material, including soil to be disposed at a hazardous waste facility and the affected area bio-remedied by a specialist in case of any large spills.
- No washing of vehicles will take place on the property.
- Facilities will be maintained and kept neat on a continuous basis.
- Any unusable scrap metal or dysfunctional machinery on the property will be collected and removed on a monthly basis and the allocated storage space will fenced off and be earmarked for this purpose.
- At closure all remaining stockpiles will be flattened and reintroduced to disturbed quarry areas and all waste will be removed off site and disposed off in an appropriate manner.
- A general clean up of the property will be done on a weekly basis and before every year end closure and all personnel will be involved to establish a sense of pride in achieving a clean environment.

VISUAL IMPACT AND AESTHETIC ACCEPTABILITY

Regardless of the undisturbed ecology of the site itself, the landscape of the site can be classified as fairly attractive and of medium aesthetic quality. This is due to the surrounding alien infestation,

mining, urban development and low cost housing activities on the neighboring properties, that reduce the aesthetic quality of the study site. Therefore the general landscape can be described as low aesthetic quality with little environmental attractiveness. Roads, telephone and power lines and residences on farms further reduced the aesthetic value of the surrounds. Onsite assessment of immediate landscapes revealed that the proposed mine is bordered at the one side by semi or completely transformed land.

The site is not visible from Mission Road or any residential area. Even during operation, the site will still not be visible, due to the topography and alien infestation screen.

The fact that the neighboring property was previously disturbed and left un-rehabilitated, does to some extent constitute a lesser focal point in the landscape and will result in the visuals of the area being marginally affected and would request a proper re-vegetation approach, irrespective thereof that surrounding areas dispose of low to medium quality landscapes. Also, the fact that Afrimat is much more visible from Mission Road and local people have grown accustomed to these types of activities also softens the visual impact of this site to a small degree.

Therefore, an undertaking is necessary that the ecology of the area will be restored to prevent it from reverting to the poor status of the neighboring site.

Mining will change the texture (vegetated/rough to bare/smooth) and color (green/brown to whitish-grey) to a small degree. This impact will be temporary. Since the land displays a hilly topography, the newly established box-cut with limited slope heights will be readily absorbed in the landscape.

Since the proposed mining site is screened by alien vegetation and general topography of the area, from the nearby roads and residences and since the area does not constitute a major tourist destination, the impact on tourist potential is rated very low but the rehabilitation programme should still be expedited as far as possible.

Infrastructure such as the mobile crusher and screen, will be erected in the mining area, but will not be visible to any public member and this will be a temporary impact and rated very low.

Stockpiles within the quarry would be low and not readily protrude above the original level of the land and will only equal one days demand. It is not expected that it would cause the quarry operation to become more visible. Little dust generation on the internal haul road will be experienced, resulting in only a limited visual dust plume to hang in the air above the road, but as previously discussed, this impact can be positively mitigated and is rated low.

Due to the low intensity operation, visual intrusion would be minimal and temporary within the surrounding landscape. In conclusion, the all-over visual impact can be rated low, but with the prescribed mitigating measures in place, the impact can be further reduced to very low.



Figure 26: Northern view of the site



Figure 27: Eastern View of the site



Figure 28: Southern view of the site

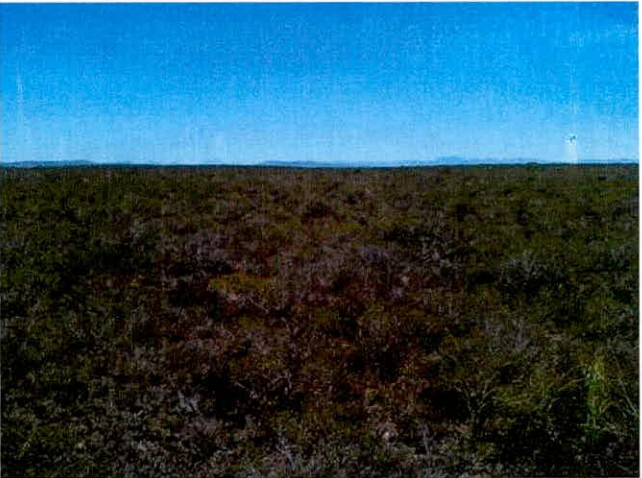


Figure 29: Western view of the site

Visual impact

	OPERATIONAL (no mitigation)	OPERATIONAL (with mitigation)	CLOSURE
Extent	Local	Local	Site Specific
Duration	Medium Term	Short Term	Long Term
Intensity	Low	Low	Very Low
Probability	Possible	Unlikely	Definite
Significance	Low	Low	Very Low
Status	Negative	Negative	Slightly Negative
Confidence	High	High	High

REMEDIAL MEASURES

- No vegetation clearing will take place outside the proposed mine area during the mining operation.
- Reduce visual impact through proper re-vegetation and retaining tree screens along the gravel road.
- The proposed mine areas will be kept clean and free of litter on a continuous basis. A weekly clean up of the entire site will be done.
- No dumping of waste will be allowed on the property.
- Disturbed areas will be progressively developed and rehabilitated as indicated under 'quarry development'.
- Cuts will follow curvilinear lines, which will blend in with those of the surrounding landscape, rather than straight geometric lines.
- The sides of the quarries will rounded off through a cut and fill action to create a minimum slope of 1:2.
- Alien vegetation will be removed on a continuous basis to ensure that established natural vegetation is not again out competed.
- Excessive dust plumes within the mine area or on the haul roads will be eliminated through wetting.
- At closure all stockpiles will be flattened.
- Visuals will be drastically improved at closure of the mining concern.
- At closure, all disturbed areas would have been rehabilitated as per the re-vegetation plan.

The existing access gravel road south of the mining area will be used, which links up with Mission Road. The Department of Roads and Transport can be consulted, if concern is raised, due to fact that traffic volumes will increase to a small extent. But it must be bore in mind that this road is only used by Afrimat and the public attending the oval track at the start of this gravel road. The road is currently in a very good condition and well maintained.

Line of sight entering the Mission Road is good. Drivers will be sensitized on safety procedures and the drivers of the company should be already skilled. 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 high hauling rates, a flagman should secure the access. The access road may develop ruts during wet periods and will require upgrading. Material from the mine will be used for this purpose and a wearing course of at least 30cm will be constructed. Once mining is terminated, the access road will be retained for future use.



Figure 30: Gravel Access Road



Figure 31: Entrance controlled with gate.

Mission Road is a public road and is currently under heavy vehicle strain mostly due to the Afrimat mining activities. Currently, the majority of impact is mainly experienced on the stretch of road between the Afrimat quarry and Old Cape Road. It is not in the desired maintenance state although it is designed for use by all types of vehicles. The surface of the road is poor, and some potholes and edges breaking away were noted.

The DRT and Municipality are responsible for maintenance and some patch work was noted, but as indicated, the heavy vehicle strain adds to the continual chipping away of road surface. Developing this site will add to the heavy vehicle load on the road and will therefore add to the transport impact, not only from a road maintenance point of view, but also from a social and safety point of view.

The safety of road users should always be a priority. A traffic survey and access motivation, completed in 1998, was sub-contracted to a local consulting engineering. Their findings conclude that ample capacity exists on Mission Road for any additional traffic generated by any new development. More recent traffic survey done in 2008 confirmed the abovementioned:

- Mission Road is 6.5 m wide asphalt surface road within a 20m road reserve.
- Counting station north from the proposed mining site on Mission Road, indicate a total 24-hour traffic flow of 2295 vehicles in both directions.
- Peak hour traffic flow relates to 283 and 201 trips in both directions during am and pm peak hours respectively, with a directional distribution of about 60:40 in both cases.
- Concluded that traffic flow on Mission Road is *relatively low* and reserves the capacity for an increase of traffic on this section of road.

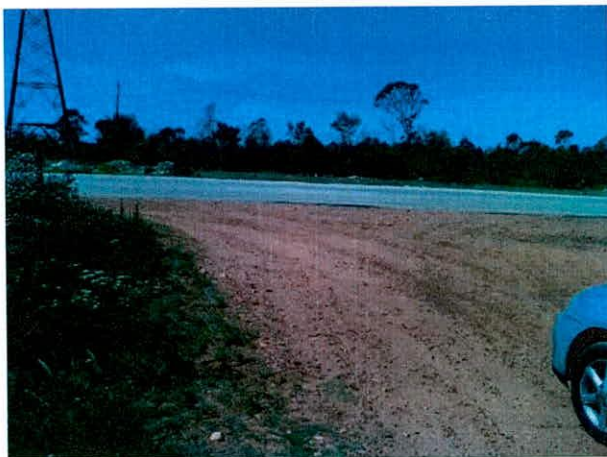


Figure 32: Entrance view into Mission Road

Therefore, Mission Road will be used as haul roads to the relevant markets and there are no alternatives available. The impact on Mission Road is rated moderate considering the contribution to the overall freight that is hauled on this road. It would therefore be essential that adequate liaison between the applicant and the DRT and Municipality be established in terms of the repair of any section of the road that could pose a threat to the public.

To accommodate the nearby property owners, material will only be carted from the property as from 08:00 to 17:00 during the week, but may result in the need to cart sand on Saturday mornings.

Road safety for motorists is of importance and truck drivers will be informed accordingly and be sensitized towards displaying proper road etiquette, the impact is therefore rated of low-moderate significance.

Traffic impact

	OPERATIONAL (no mitigation)	OPERATIONAL (with mitigation)	CLOSURE
Extent	District	District	District
Duration	Medium Term	Medium Term	Medium Term
Intensity	Medium	Low-Medium	Low-Medium
Probability	Definite	Likely	Likely
Significance	Moderate-High	Moderate	Low (if upgrading is done) Moderate (no upgrading)
Status	Negative	Negative	Negative
Confidence	High	High	High

REMEDIAL MEASURES

- All vehicles will be properly maintained in accordance with Eastern Cape Roads Act 3 of 2003.
- All drivers will display the necessary road etiquette and dispose over applicable drivers licenses and this aspect will be included in the environmental awareness programme.
- No unnecessary hooting would be permitted.
- Vehicles entering the Mission Road or any other public road, will come to a complete stop before entering the road and any transgressions in this regard will be heavily penalized. All contractors will sign a letter of agreement to this effect.
- All vehicles visiting the quarry shall be road worthy and will be included in the agreement with contractors.
- Overloading will not be permitted. Speeding will be prohibited and drivers will be penalized should it be proved that this requirement is contravened.
- Hauling of material will only mostly commence at 08:00 and ceases at 17:00. No vehicles may park along the road outside the mine area before or after the said times.
- The appropriate signage (W107 & W108 –1,2m size) will be erected on both sides of the quarry entrance and access to Mission Road will be maintained in collaboration with the District Roads Engineer.
- The District Roads Engineer and /or the Nelson Mandela Bay Municipality will be consulted on the maintenance of the road to be used.

- If poor visibility or slow access of vehicles onto Mission Road could result in any accidents, a flagman will be used at the access.
- Internal haul road will be maintained to an acceptable standard to prevent erosion and maintain safety standards.

SOCIO -ECONOMIC IMPACT

Currently, the general monopoly of quartzite owned mines in Port Elizabeth caused price spiking to over 50% resulting in higher building and construction costs. Contracts between the building companies and home owners was signed before the sudden rise in construction material, which is causing the construction companies to have under quote and budget for projects. This further resulted in building companies to close down, lose contracts, or even being sued for breached of contract.

This mining concern will provide fair competition with the aim to stabilize price control over construction material in the Port Elizabeth area. This will definitely benefit other trade industries and eventually the consumers, thus having a positive socio-economical impact.

The quarry will play a low-moderate role in the development of Port Elizabeth infrastructure. It is predicted that the development of the quarry will be of value to the building sector. In addition, the quarry will generate permanent and casual work for a number of people and must be seen as a positive contributor to upliftment of inhabitants of the Metro. Establishing the concern will definitely result in certain downstream employment and other spin-offs in the building industry.

The establishment of the concern will have very limited impact on surrounding agricultural activities. It potentially could pose some social impacts on residents in terms of limited air pollution in the form of dust & noise as well as visual impact especially during periods of high winds but with the mitigation measures described elsewhere, these impacts could be reduced to acceptable levels and also baring in mind that immediate residents are far from this development. Therefore, it is expected that should the guidelines of the EMP be followed, no complaints are expected.

Since operational hours will be restricted to daytime, light pollution at night is not a consideration. Based on the above, the overall social-economic impact is rated positive.

	OPERATIONAL (no mitigation)	OPERATIONAL (with mitigation)	CLOSURE
Extent	District	District	District
Duration	Short Term	Short Term	Short Term
Intensity	Low	Low	Low
Probability	Definite	Definite	Definite
Significance	Very Low	Low-moderate	Low
Status	Positive (economic attributes outweigh the negative social impacts)	Positive (economic attributes outweigh the negative social impacts)	Negative (loss of jobs and income and less spin-offs)
Confidence	High	High	High

Remedial measures to be implemented are:

- Those described under previous headings plus establishing regular meetings with nearby neighbors.

SITES AND STRUCTURES OF ARCHAEOLOGICAL AND CULTURAL INTEREST

These sites represent the heritage of communities and are therefore protected in terms of current legislation. In addition all material/buildings older than 60 years are protected. 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 in this regard. Nevertheless the operator of the excavator should be briefed regarding this aspect. Local communities may use some of the remaining vegetation for medicinal purpose but since the site is not located close to residential areas, located on private property and devoid of any medicinal plants, the impact is rated low. However the Khoisan people inhabited the study area historically and it is therefore possible that artifacts and sites of archaeological importance could be identified onsite.

Since mining will be done in an undisturbed area, a heritage impact assessment will be completed should the DME so request.

Should mining continue, the operators of earthmoving equipment will be informed of the company's obligation in this regard and to inform management when anything of interest is noted on the site. Dr. Binneman at the Albany Museum in Grahamstown and SAHRA office in East London will be

contacted immediately if any object of importance is observed and all operations would be suspended immediately.

PUBLIC PARTICIPATION

The setting of the land concerned is rural and surrounded on by semi-transformed land divided into small farms belonging to private owners. Current legislation (section 10 of the MPRDA) requires that interested and affected parties be consulted and as part of the public participation process the following steps were taken:

- Abutting landowners were consulted on the proposed development and only Afrimat have indicated that they objected and would like more information. Correspondence was only sent via email and these letters were submitted to the DME some time ago.
- The landowner was consulted, but has not submitted any objections to date to SES; although the Municipality did indicate verbally that they would like to oppose the development, no formal letter has been received.
- The Department of Land Affairs was also consulted since a land claim is currently underway on the same property, however, to date no response have been received by them.
- The DME will consult with Departments of Water Affairs, Agriculture and Environmental Affairs.
- At closure, abutting landowners and affected departments will be consulted on the end result of rehabilitation.

CONCLUSION

- A. The proposed quarry can be developed in a sustainable manner provided that the following requirements are met:
1. A phased approach must be followed and should the applicant not be able to rehabilitate Phase/bench 1 effectively operations at the quarry must be stopped.
 2. Alien trees must be prevented from establishing in the mine area.
 3. The Department of Minerals & Energy must provide the necessary guidance and monitoring and where applicable enforce environmental legislation.

- B. The proposed quarry can meaningfully contribute to the building industry and economic growth of the Metro. 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 has to rehabilitate the area disturbed in case of liquidation or abscondence of the holder. In this regard it should be noted that only one quarry will be developed at a time and this serves as an undertaking to this effect.

ANALYSIS OF REHABILITATION COSTS: PRIVATE RATES

GENERAL

Tendering process & advertisement = **R4000**

Transport of equipment = **R3000**

Supervision fees and reporting = **R7000**

Aftercare – erosion, alien eradication, seeding/planting and monitoring = **R15 000**

Closure documents = **R5000**

Contingencies = **R5000**

Sub-Total = R39 000

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

Drilling and profile blasting @ R20/m³ = **R50 000**

Cut and fill of production faces (1:2) 5 000m³ @ R7/ m³ = **R35 000**

Rotovating of disturbed areas before topsoil is replaced (10cm deep) – 1,5ha @ R3000 per ha =

R4 500

Spreading of 4500m³ of topsoil @ R5 per cubic meter = **R22 500**

Seeding and fertilising of 0,4ha –@ R3000 per ha = **R1 200**

Cut-off drain = **R4 000**

Planting of trees and shrubs – **R12 000**

Removal of waste, scrap metal and redundant equipment etc = **R5 000**

Erosion control measures = **R5 000**

Spreading of oversize material on slopes = **R10 000**

Sub-Total = R149 200

Grand Total = R188 200

A financial guarantee to the value of R120 000 will be made available to the DME before approval. It is proposed that the applicant submit two additional payments of R35 000 each every six months or before commencing with ensuing phases. Should the applicant rehabilitate each phase concurrently with mining it is proposed that the additional payments are reduced to R15 000 each.

UNDERTAKING: IMPACT ASSESSMENT

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

Signed on this day 19 of March 2010



Signature of applicant

MONITORING AND PERFORMANCE ASSESSMENT

INSPECTIONS AND MONITORING

- Regular monitoring of all the environmental management parameters and implementation of measures will take place and the holder of the mining permit shall carry out certain components thereof to ensure that the provisions of this programme are adhered to.
- Ongoing and regular reporting on the progress of implementation of this programme will be done.
- Various compliance areas will be identified with regard to the various impacts that the operations will have on the environment.
- Inspections and monitoring shall be carried out on a regular basis with specific emphasis on profiling of disturbed areas, re-vegetation progress, die-off of established vegetation and prevention of water quality deterioration and prevention of spreading of alien vegetation.

- Layout plans will be updated annually or should mining operations change drastically and updated copies will be submitted to the DM.
- Any environmental emergency/accident will be reported immediately to DM and where applicable to DWA/DEA.
- Should the assessment of environmental impacts in future be proved incorrect or should have impacts been unknown when the programme was compiled, then additional assessments shall be carried out and added as an amendment and where applicable a second opinion will be sought.
- All environmental hazards, unforeseen impacts identified, pollution incidents or environmental failures will be reported to the DM and other relevant Departments immediately.
- A six-monthly performance assessment will be compiled and submitted to the DM in June and December for evaluation and acceptance.
- Once extraction is completed a closure program will be compiled 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 are covered, that procedures followed were in line with the conditions of the management plan and that rehabilitation was completed in accordance to the management plan. Should any major shortcomings be detected then an amendment to the EMP/closure plan will be drafted and submitted for approval by the DM.

The following site specific monitoring will be executed:

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

- All plants that can be safely transplanted will be removed to disturbed areas.
- Transplanted plants will be irrigated on a regular basis.
- The minimum vegetation is 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 is according to approved guidelines and that the necessary precautionary measures for spills are adequate.
- General waste is handled correctly and effectively removed from the property.
- Dust control on the roads at the quarry is effective to limit air pollution.
- Ensure that river gravels are not polluted with hydrocarbons.
- That the mine is clean and tidy.
- Should any remedial measure fail, it will be adapted to suit circumstances or alternatives would be found in conjunction with the officials in affected Departments or with private experts.
- An environmental awareness programme can 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 SCHEDULE

QUARRY

1. Profiling of Phase 1/Bench 1 – continuous with mining with and completed before commencement of Phase 2/Bench 2.
2. Spreading of oversize boulders and/or overburden, if any – daily
3. Re-vegetation of Phase 2/Bench 2 must be completed within 6 months after completion of mining.

4. Submit a closure plan & risk assessment three months before mining operations are to cease.
5. Aftercare/maintenance – Two years after rehabilitation was successfully completed.

GENERAL

1. Quarterly eradication of alien vegetation until closure certificate is issued
2. Light application of fertilizers in March and September for duration of mining, rehabilitation and aftercare phases.

CLOSURE OBJECTIVES

Closure objectives will be based on the following:

1. Identify the key objectives for mine closure to guide the project design, development and management of environmental objectives;
2. Provide broad future land use objective(s) for the site; and
3. Provide proposed closure cost
 - The mine area will be rehabilitated back to a sustainable environment. The ecology of the area will be improved by establishing fynbos grass within the area and thereby creating an improved niche for animal species.
 - Production faces of the quarry will be profiled, through profile blasting and a cut and fill method to 1:2 slopes and the edge rounded off to create a flowing landscape.
 - Faces will not remain vertical, but 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 mining landscape.
 - The rehabilitated area will be kept clear of alien and invasive plant species.
 - The new access roads will be ripped, top dressed with topsoil and seeded. It will be rehabilitated back to grass land.
 - The area would be litter free.

- There will be no remaining stockpiles, equipment, waste, scrap metal/redundant equipment left in the mining environment.
- Hydrocarbons, and contaminated soil, if any, will be safely removed from site.
- Safe drainage of the mine must be achieved without causing erosion of the slopes and the quarry floor.
- Some animals will be able to return safely to the site
- The mining sites will not become prone to unauthorised dumping.
- The proposed land-use will be achieved within 1 year after rehabilitation has been completed.
- Nearby residents will not be subjected to any post closure social or environmental impacts.

AFTERCARE

It is anticipated that the following aftercare will be provided over one year:

- Vegetation cover – reseeds bare areas or replant shrubs and trees. – September to March
- Stability of production faces – Reshape affected areas, compact - May to August - Seeding done as from September to March
- Eradication of alien vegetation – Quarterly

POST CLOSURE MAINTENANCE

Considering that the mining area could be prone to severe scouring during extreme flows the mine area environment could be totally changed and post closure maintenance could be required. In order to provide the necessary funds for this task the following funds need to be secured:

Eradication of invasive vegetation = R4000 per annum x 2 year = **R8000**

Infill of any erosion gullies or collapse of cross drains – **R15000**

Seeding, fertilizer van infill planting – **R5000**

Total = R28 000

The quarry area will resemble a box cut into the hill with sloped faces reflecting gentle gradients. The area will display a heterogeneous grassland but with a false fynbos component, which will align the site with the surrounds. The anticipated change in landform will after re-vegetation not be clearly noticeable and from an aesthetic point of view the landscape will have a higher aesthetic quality than what is currently the case. With the rehabilitation approach to be adopted, the objective is to reach 60% of remaining indigenous species diversity within 3 years and 80% within 5 years time.

If rehabilitation is not afforded adequate time and finances the above assessment will change dramatically and the area will revert to a heavily invested area reflecting poor quality landscape and extensive erosion.

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, Deon Jansen van Rensburg, 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	A fine or imprisonment of

	demarcated in the EMP	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

SM Pierce & AD Mader - STEP Handbook

Department of Environmental Affairs and Tourism: National Biodeversity Strategy and Action Plan

Nelson Mandela Bay Municipality – NM MOSS Handbook

Mr John Victor

UNDERTAKING

I, Deon Jansen van Rensburg, the undersigned have studied and understand the contents of this document in it's 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 at **Port Elizabeth** on this 19 day of March 2012.



Signature of applicant

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

APPROVAL

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

Signed at **Port Elizabeth** on this _____ day of _____ 20____.

.....

REGIONAL MANAGER

EASTERN CAPE

Copy right on the format and contents of this report are reserved to Stellenryck Environmental Services.



Stellenryck Environmental Solutions

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Date: 10 February 2010

MINING PERMIT APPLICATIONS FOR STONE AGGREGATE AND GRAVEL MINING ON ERF 1362 BLOEMENDAL, PORT ELIZABETH.

Almenta 46 (Pty) Ltd submitted two applications to the Department of Minerals and Energy (DME) to mine stone aggregate and gravel respectively on two separate areas on Erf 1362 Bloemendal, in January 2010. Although the application is in process, a period of consultation with all interested and affected parties must follow, including an environmental impact study, before any decision would be reached by the DME.

In terms of Section 27 (5) of the Minerals and Petroleum Resources Development Act (MPRDA) the applicant, Almenta 46, must notify and consult with the landowner, lawful occupier, and any other affected party of the land involved concerning the application/s.

Stellenryck Environmental Solutions (SES) was appointed by Almenta 46 to carry out the requisite environmental studies for the above project.

This correspondence serves as written notice to you, an interested and affected party. Please submit any concern, comment, objection, or request to either the Department of Minerals and Energy (DME) or Natalie Sharp from Stellenryck Environmental Solutions (SES). Currently the proposed project is still in the initial stages and an environmental impact study is underway. Any concern raised would be highly appreciated and investigated; therefore you are encouraged to be interactive. Your concerns or comments, etc. must reach SES no later than 24 February 2010. Attach is the locality of the site for some background information regarding the projects. If you fail to meet the deadline, your comments will still be taken into consideration and incorporated within the Environmental Management Plan and consultation thereof, however you are advised to raise any issues as soon as possible.

Yours sincerely

REGIONAL SETTING OF THE PROPOSED SITE

The proposed red gravel quarry is located on Erf 1362, Bloemendal approximately 11.6 km north-west from Port Elizabeth city centre and is under control of the Nelson Mandela Bay Municipality. The Mission Road lies about 2 km to the east of the property and access to the haul road is from this road. The residential areas of Port Elizabeth Municipality namely Greenbushes are approximately 3 km to the south of the site. Abutting the proposed site is an existing hard rock quarry, owned by Afrimat. To the north and east, the Erf 1362, Bloemendal adjoins undisturbed land currently under application by the Municipality to proclaim this area as the Van Der Kamps Kloof Reserve.



Figure 1: Proposed site for Red Gravel Quarry

The proposed hard rock quarry is located on Erf 1362, Bloemendal approximately 11 km north-west from Port Elizabeth city centre and is under control of the Nelson Mandela Bay Municipality. The Mission Road Road lies about 1.3 km to the east of the property and access to the haul road is from this road. The residential areas of Port Elizabeth Municipality namely Greenbushes are approximately 2, 5 km to the south of the site. Abutting the proposed site is an existing hard rock quarry, owned by Afrimat. To the north and east, the Erf 1362, Bloemendal adjoins undisturbed land currently under application by the Municipality to proclaim this area as the Van Der Kamps Kloof Reserve.

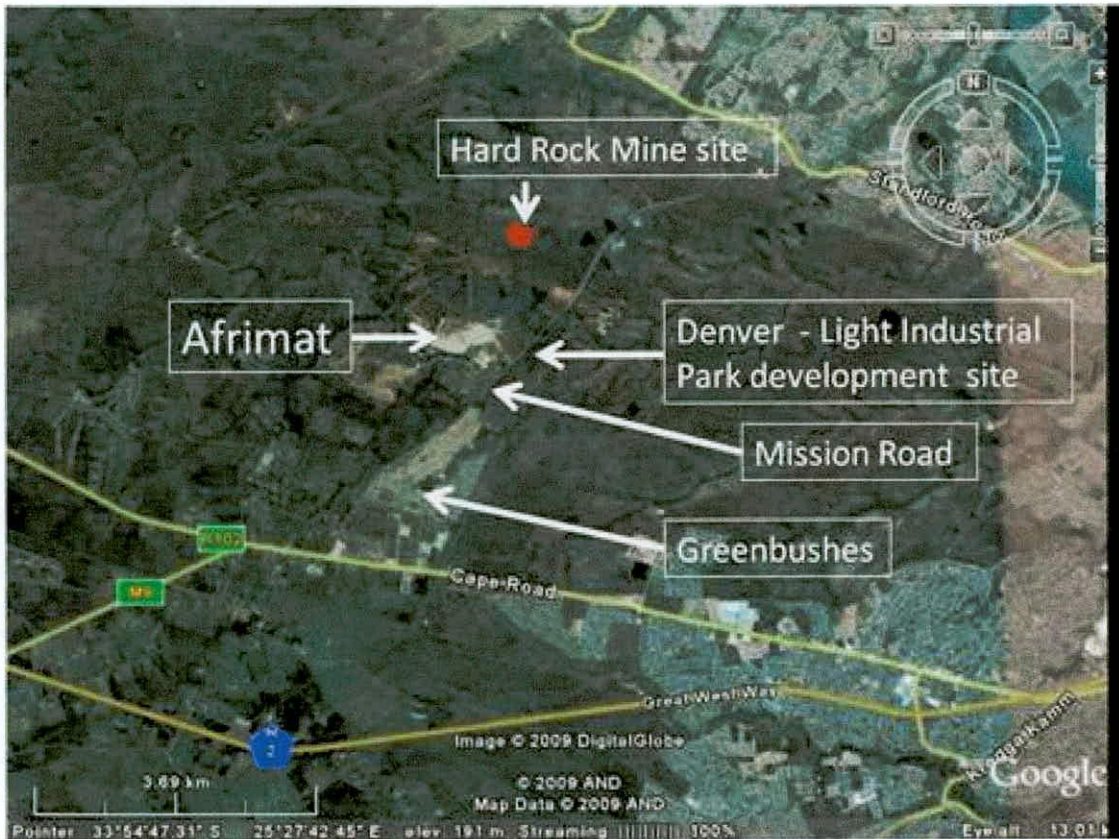


Figure 2: Proposed site for Hard Rock Quarry



Stellenryck Environmental Solutions

2008/144543/23

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The Municipal Manager
P.O. Box 116
Port Elizabeth
6000

Your ref: 0405MP & 0406 MP

Date: 10 February 2010

For Attention: The Municipal Manager

MINING PERMIT APPLICATIONS FOR STONE AGGREGATE AND GRAVEL MINING ON ERF 1362 BLOEMENDAL, PORT ELIZABETH.

Almenta 46 (Pty) Ltd submitted two applications to the Department of Minerals and Energy (DME) to mine stone aggregate and gravel respectively on two separate areas on Erf 1362 Bloemendal, in January 2010. Although the application is in process, a period of consultation with all interested and affected parties must follow, including an environmental impact study, before any decision would be reached by the DME.

In terms of Section 27 (5) of the Minerals and Petroleum Resources Development Act (MPRDA) the applicant, Almenta 46, must notify and consult with the landowner, lawful occupier, and any other affected party of the land involved concerning the application/s.

Stellenryck Environmental Solutions (SES) was appointed by Almenta 46 to carry out the requisite environmental studies for the above project.

This correspondence serves as written notice to you, an interested and affected party. Please submit any concern, comment, objection, or request to either the Department of Minerals and Energy (DME) or Natalie Sharp from Stellenryck Environmental Solutions (SES). Currently the proposed project is still in the initial stages and an environmental impact study is underway. Any concern raised would be highly appreciated and investigated; therefore you are encouraged to be interactive. Your concerns or comments, etc. must reach SES no later than 24 February 2010. Attach is some background information regarding the projects. If you fail to meet the deadline, your comments will still be taken into consideration and incorporated within the Environmental Management Plan and consultation thereof, however you are advised to raise any issues as soon as possible.

Yours sincerely

BACKGROUND INFORMATION

REGIONAL SETTING FOR BOTH APPLICATIONS

The proposed red gravel quarry is located on Erf 1362, Bloemendal approximately 11.6 km north-west from Port Elizabeth city centre and is under control of the Nelson Mandela Bay Municipality. The Mission Road lies about 2 km to the east of the property and access to the haul road is from this road. The residential areas of Port Elizabeth Municipality namely Greenbushes are approximately 3 km to the south of the site. Abutting the proposed site is an existing hard rock quarry, owned by Afrimat. To the north and east, the Erf 1362, Bloemendal adjoins undisturbed land currently under application by the Municipality to proclaim this area as the Van Der Kemp's Kloof Reserve.

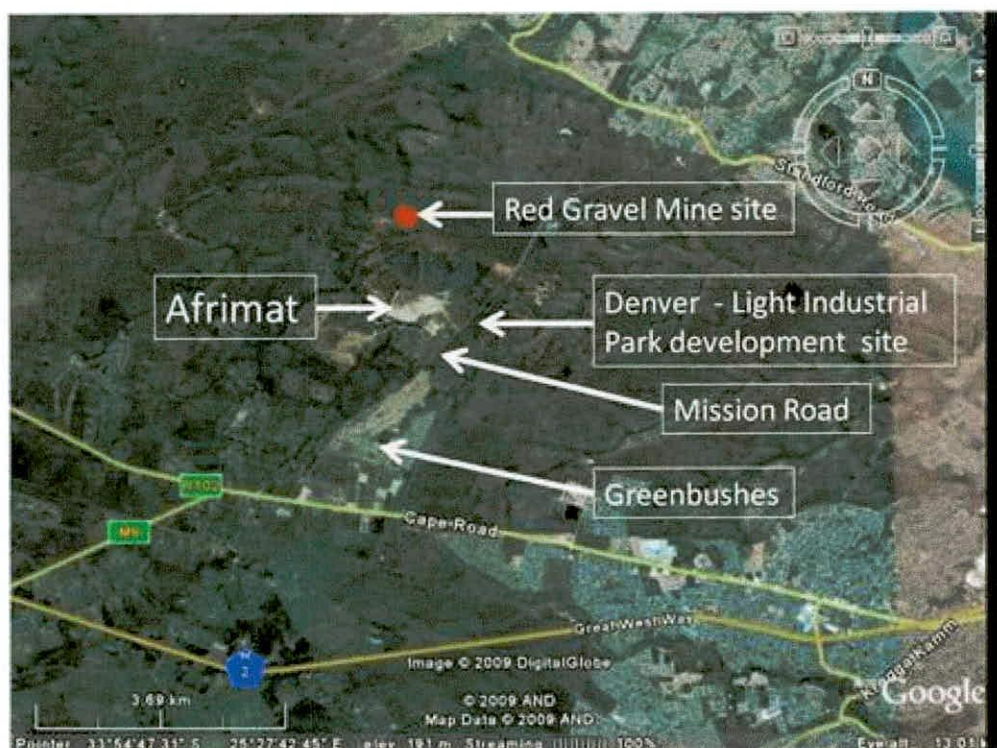


Figure 1: Proposed site for Red Gravel Quarry

The proposed hard rock quarry is located on Erf 1362, Bloemendal approximately 11 km north-west from Port Elizabeth city centre and is under control of the Nelson Mandela Bay Municipality. The Mission Road lies about 1.3 km to the east of the property and access to the haul road is from this road. The residential areas of Port Elizabeth Municipality namely Greenbushes are approximately 2, 5 km to the south of the site. Abutting the proposed site is an existing hard rock quarry, owned by Afrimat. To the north and east, the Erf 1362, Bloemendal adjoins undisturbed land currently under application by the Municipality to proclaim this area as the Van Der Kemp's Kloof Reserve.

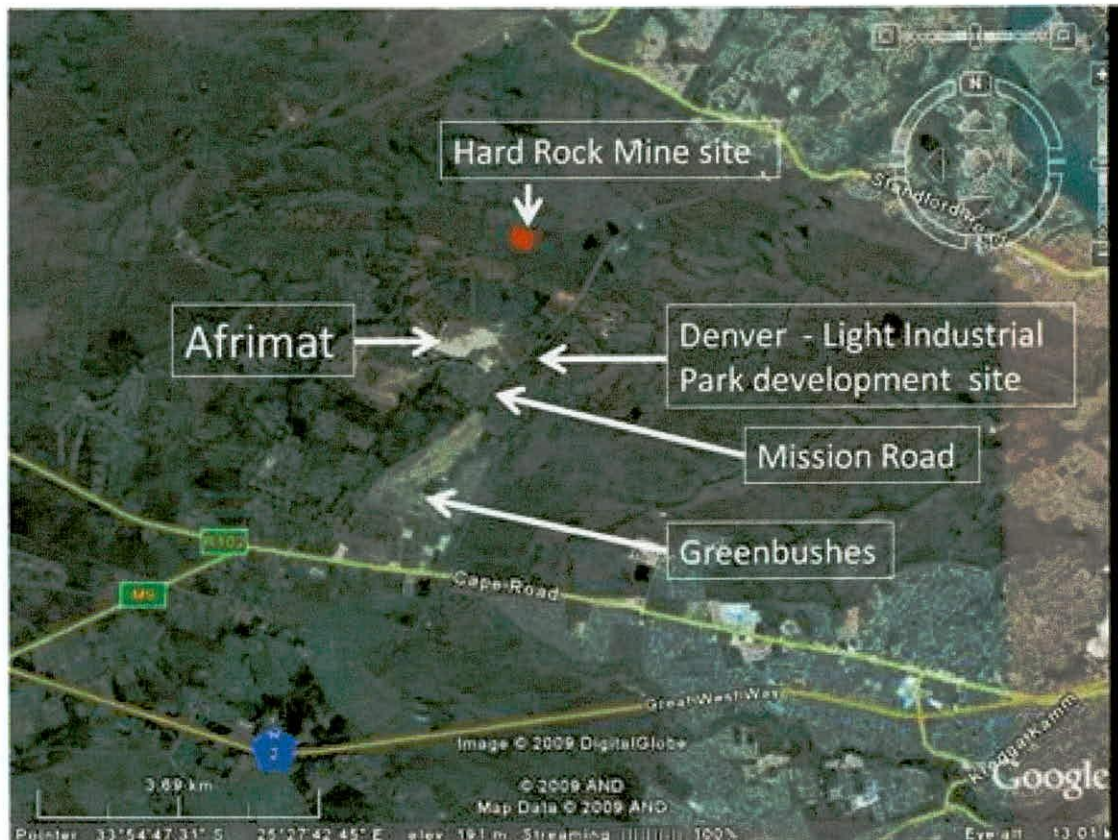


Figure 2: Proposed site for Hard Rock Quarry

MOTIVATION FOR GRAVEL AND STONE AGGREGATE MINING

Almenta 46 (Pty) Ltd is a new company which will mainly be involved in property development and construction. Currently there is no registered red gravel mine in Port Elizabeth, which results in high building and construction costs in hauling material from nearby towns. This circumstance is not because of lack of material available in the Port Elizabeth area, but rather that no other person or company has taken initiative to apply for mining authorization. Almenta 46 (Pty) Ltd has recognize this opportunity in the market and therefore decided to apply for a mining permit with the intent of applying for a mining right once the market has been established.

In terms of the hard rock application; the motivation for the application is fairly straight forward: the general monopoly of quartzite owned mines in Port Elizabeth caused price spiking to over 50% resulting in higher building and construction costs. This further resulted in building companies to close down, lose contracts, or even being sued for breached of contract.

In order to circumvent these problems and establish fair competition with the aim to facilitate price control over construction material, the applicant has made a decision to develop their own concern.

The applicant has tasked SES to submit the application and assist it with the negotiations with the property owner regarding surface use of the property and consultation with abutting landowners that will be affected through haulage of material on the property concerned.

PROPOSED MINING METHODOLOGY FOR GRAVEL MINE

The road to the proposed quarry is an existing, approved access road and in fairly good shape and links up with Mission Road. Since the road might be affected by rainfall, it will be upgraded on a regular basis with red gravel obtained from a legal source. Where necessary it will be protected against erosion by means of cross and mitre drains. Access to the site will be controlled by means of property fences and gates.

Potable water will be obtained from the Municipality and brought to site daily. The workforce would not reside on the mine, but will commute to work every day. Due to the anticipated fairly small workforce involved, no waste disposal site is required. A container with a lid would be placed near easy accessible areas on the mining area for the storage of household waste. No sewage plant would be required; a chemical toilet will be provided at the entrance to the mine area.

Newly rehabilitated areas will also be irrigated when necessary and water could be brought to site via a water cart. In addition, topsoil stockpiles will be covered with vegetation or shade cloth when circumstances dictate.

No maintenance yard will be established since all vehicles will be maintained off site at the contractor's workshop. The proposed operation would be continuous and working hours will be from 7.30 am to 5 pm five days a week with cessation of activities at 1 pm on Saturdays if market demand requires mining over the weekend.

An average production rate of approximately between 1 500 cubic meters (loose) per month is anticipated over a period of approximately 16-20 months.

The total mine area comprises about 1.5 Ha and the average depth of the mine would be approximately 2 meters. The potential 30 000 cubic meters of gravel would be extracted with the aid of frontend loader and dumper trucks. After extraction, material will be carted directly to the relevant markets. Only a small stockpile will be created within the excavation. All extracted material would be utilized and no residue would be generated.

Gravel will be extracted from west to east and development will take by means of an excavator. Mining will be executed in 4 phases. Mining would start in phase 1 and proceed in an easterly direction. Mining of phase 2 will then follow with the concurrent rehabilitation of phase 1. Each phase will be approximately 0,37 Ha each. The same scenario would apply to phases 3 & 4. Complete rehabilitation of phase 1 will be achieved prior to the development of phase 3. The existing access road will be used and links to the Mission Road.

The slopes created will be profiled to a 1:3 gradient to ensure the stability of the soil. Mining will result in a flat quarry floor.

Alien vegetation surrounds the mining site and for the time being will not be removed, since it serves as a visual barrier.

The topsoil is fairly limited and consists mainly of a mix of gravel and clay material. The overburden consists mainly of a clay mix and is unsuitable for the building industry. Both these stockpiles will be stored on the inside of each phase, separate from each other.

It is expected that some water might dam up in periods of high rain after mining due to the loss of the gravel which is of high porous nature. The site will not be free draining. Potable water would be obtained from the property owner or brought to site daily. The workforce would not reside on the mine, but will commute to work every day.

The proposed operation would be continuous and working hours will be from 7 am to 5 pm five days a week with cessation of activities at 1 pm on Saturdays if market demand require.

PROPOSED MINING METHODOLOGY FOR AGGREGATE MINE (HARD ROCK)

The road to the proposed quarry is an existing, approved access road and in fairly good shape and links up with Mission Road. Since the road might be affected by rainfall, it will be upgraded on a regular basis with red gravel obtained from a legal source. Where necessary it will be protected against erosion by means of cross and mitre drains. Access to the site will be controlled by means of property fences and gates.

Potable water will be obtained from the Municipality and brought to site daily. The workforce would not reside on the mine, but will commute to work every day. Due to the anticipated fairly small workforce involved, no waste disposal site is required. A container with a lid would be placed near easy accessible areas on the mining area for the storage of household waste. No sewage plant would be required; a chemical toilet will be provided at the entrance to the mine area.

A dust suppression system will be used to lower dust levels at the crushing plant. Water for this purpose could be trucked in to feed a raised water tank and connected reticulation system and sources of dust will be addressed. Newly rehabilitated areas will also be irrigated when necessary. In addition, topsoil stockpiles will be covered with vegetation or shade cloth when circumstances dictate.

No maintenance yard will be established since all vehicles will be maintained off site at the contractor's workshop. The proposed operation would be continuous and working hours will be from 7.30 am to 5 pm five days a week with cessation of activities at 1 pm on Saturdays if market demand requires mining over the weekend.

An average production rate of approximately between 5 000 - 10 000 cubic meters (loose) per month is anticipated over a period of approximately 12-20 months.

Through blasting, the material will be loosen and loaded onto front-end loaders where it will be carted to the mobile crusher. Mining will commence on the eastern perimeter and then progressively be lowered into the hill in a westerly direction. At closure the floor of the development will not be lower than 10m. Initial development will clear the vegetation of an area of 50m x 50m and entail cutting into the floor and establishing the first bench of approximately 5m (deep) x 10m (wide). A face of 5m high will be created along the eastern perimeter and the second platform will progress towards the northern perimeter and similarly established. A second face of 5m high will be created. The horizontal platforms of the benches will not be less then 20 m wide to ensure sufficient space for the profiling of the benches to reach a 1:2 gradient and retain a horizontal width of no less than 8 m. This will be sufficient to act as an energy breaker for water runoff and stabilize the slopes of the benches. Once the following bench is established, the previous bench will be covered with the topsoil that was removed and it will be re-vegetated with the prescribed seed mix. Development of the second bench may not proceed unless the first bench are profiled and covered with topsoil. Each bench development can be seen as a phase development of the mining site. This development approach will ensure that concurrent rehabilitation takes place. An adequate buffer zone will be left intact between the mining area and the drainage channel located to the north of the mining area. To ensure a concurrent rehabilitation process the 2nd phase will not be developed if the previous

phase has not been profiled and provided with topsoil. The slopes created will be profiled through precision blasting and cut & fill method to a 1:2 gradient, to ensure the post closure stability of the slopes. Mining will result in a box cut in the hill.

As mining progresses and the disturbed area become larger, water runoff will increase from the edges, which could result in erosion and increasing the silt load of runoff. To curb this problem, the drainage pattern of the study area will be slightly altered by diverting upslope runoff with a berm to the water course (drainage line) to the north and south of the mining site, to prevent clean water from becoming contaminated and impact on the unstable production faces. This berm will require maintenance over the medium term until disturbed areas has regained its stability and thereafter it can be removed to facilitate normal surface drainage.

COMPENSATION

Mineral Rights belong to the State and no compensation will be payable for the mineral to be extracted. Compensation will be payable for surface use and be based on current economic activities on the land concerned or as a minimum in terms of LLSU/SLSU applicable for this area.

CONCLUSION

There are various environmental and social impacts associated with the abovementioned applications and will be dealt with in full detail in the Environmental Impact Study and Management Plans. The abovementioned is only to provide background information and proposed development strategies.



Stellenryck Environmental Solutions

2008/144543/23

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By Registered Post

Department of Rural Development and Land Reform
P O Box 1375
EAST LONDON
5200

Your ref: 0405MP & 0406 MP

Date: 5 March 2010

For Attention: Ms V Daniel

MINING PERMIT APPLICATIONS FOR STONE AGGREGATE AND GRAVEL MINING ON ERF 1362 BLOEMENDAL, PORT ELIZABETH – **PROPERTY CURRENTLY PENDING A LAND CLAIM.**

Almenta 46 (Pty) Ltd submitted two applications to the Department of Minerals and Energy (DME) to mine stone aggregate and gravel respectively on two separate areas on Erf 1362, Bloemendal, in January 2010. Although the application is in process, a period of consultation with all interested and affected parties must follow, including an environmental impact study, before any decision would be reached by the DME.

In terms of Section 27 (5) of the Minerals and Petroleum Resources Development Act (MPRDA) the applicant, Almenta 46, must notify and consult with the landowner, lawful occupier, and any other affected party of the land involved concerning the application/s.

Stellenryck Environmental Solutions (SES) was appointed by Almenta 46 to carry out the requisite environmental studies for the above project.

This correspondence serves as written notice to you, an interested and affected party. Please submit any concern, comment, objection, or request to either the Department of Minerals (DM) or Natalie Sharp from Stellenryck Environmental Solutions (SES). Currently an environmental impact study is underway. Any concern raised would be highly appreciated and investigated; therefore you are encouraged to be interactive. Your concerns or comments, etc. must reach SES no later than 6 April 2010. Attach is some background information regarding the projects.

Yours sincerely

BACKGROUND INFORMATION

REGIONAL SETTING FOR BOTH APPLICATIONS

The proposed red gravel quarry is located on Erf approximately 11.6 km north-west from Port Elizabeth city centre and is under control of the Nelson Mandela Bay Municipality. The Mission Road lies about 2 km to the east of the property and access to the haul road is from this road. The residential areas of Port Elizabeth Municipality namely Greenbushes are approximately 3 km to the south of the site. Abutting the proposed site is an existing hard rock quarry, owned by Afrimat. To the north and east, the Erf 1362, Bloemendal adjoins undisturbed land currently under application by the Municipality to proclaim this area as the Van Der Kamps Kloof Reserve.



Figure 1: Proposed site for Red Gravel Quarry

The proposed hard rock quarry is located on Erf 1362, Bloemendal approximately 11 km north-west from Port Elizabeth city centre and is under control of the Nelson Mandela Bay Municipality. The Mission Road lies about 1.3 km to the east of the property and access to the haul road is from this road. The residential areas of Port Elizabeth Municipality namely Greenbushes are approximately 2, 5 km to the south of the site. Abutting the proposed site is an existing hard rock quarry, owned by Afrimat. To the north and east, the Erf 1362, Bloemendal adjoins undisturbed land currently under application by the Municipality to proclaim this area as the Van Der Kamps Kloof Reserve.



Figure 2: Proposed site for Hard Rock Quarry

COMPENSATION

Mineral Rights belong to the State and no compensation will be payable for the mineral to be extracted. Compensation will be payable for surface use and be based on current economic activities on the land concerned or as a minimum in terms of LLSU/SLSU applicable for this area.

CONCLUSION

There are various environmental and social impacts associated with the abovementioned applications and will be dealt with in full detail in the Environmental Impact Study and Management Plans. The abovementioned is only to provide background information.

