APPENDIX E: WELVERDIEND DETAILED ENVIRONMENTAL IMPACT ASSESSMENT

1. INTRODUCTION

This section contains the assessment of potentially significant positive and negative environmental impacts associated with the proposed project. Specific emphasis was placed on any relevant significant environmental, social and economic impacts identified from the specialist studies, issues raised in the public participation process and professional judgement of the EAP.

1.1 Ecology

The proposed mining site is located inside a largely untransformed, but severely degraded or overgrazed shrubland, classified as Knersvlakte Dolomite Vygieveld and Vanrhynsdorp Gannabosveld. The largest portion of the mining site intrudes into the latter, while a quarter (or less) intrudes into Knersvlakte Dolomite Vygieveld. None of the vegetation types are currently considered as threatened. Being well represented and not threatened, the impact on vegetation type per se will be of low significance, with mitigation (Table 1 below summarises the impact). The impact is expected to be long term to permanent, depending on rehabilitation success after the completion of mining activities. In the long term, the mining site will require a sustained management effort to control the aliens and allow indigenous species to re-establish during the rehabilitation phase.

Table 1: Impact on vegetation type

	Extent	Intensity	Duration	Consequence	Probability	Significance
Construction and Operational Phase						
Without Mitigation	Local 1	Medium 2	Long- term 3	Medium 6	Probable 3	MEDIUM
With mitigation	Local 1	Medium 2	Long-term 3	Low 5	Probable 3	LOW

The southern portion of the proposed mining site, being located inside Knersvlakte Dolomite Vygieveld and encroaching onto the Wiedou River, poses the greatest impact as this area is more species rich and potentially more sensitive to erosion (steeper). This area should rather be excluded from mining in order to avoid species loss and minimising erosion. The impact on biological linkage is also likely to have some significance, due to the mining area extending into a CBA associated with the Wiedou River (see Table 2). This can however be avoided or minimised by moving mining activities slightly further away (northwards) from the Widou River. However, extensive areas of shrubland around the site are still intact maintaining the east-west ecological corridor along the Wiedou River. There will be no impact on known Species of Conservation Concern.

Table 2: Impact on biological linkage and CBA's

	Extent	Intensity	Duration	Consequence	Probability	Significance
Construction and Operational Phase						
Without Mitigation	Local 1	Medium 2	Long- term 3	Medium 6	Probable 3	MED-HIGH
With mitigation	Local 1	Medium 2	Long-term 3	Medium 6	Probable 3	LOW

As an indirect impact, soil disturbance caused by opencast mining activities will provide ideal conditions for the establishment of alien invasive vegetation. However, it is unlikely that any woody aliens, such as *Prosopis glandulosa*, will become problematic. *Prosopis glandulosa* and *Nerium oleander* are confined to the Wiedouw River streambed and will not spread into the mining area. Weedy pioneer species, such as *Atriplex* species, *Stipa capensis* and *Bromus pectinatus*, will probably be the first to establish and prevail. These will be difficult to control, but the impact is not considered significant, given the degraded condition of the veld.

Impact on fauna will be of low to medium significance, without mitigation. Since the Wiedouw River will not be directly affected by mining activities, mammals visiting the river will not be interfered with. Residing mammals on the proposed mining site, such as aardvark and porcupines, will be directly affected. It must be noted that sheep farming has probably displaced most of the indigenous mammal fauna. One can expect that all large fauna will move away with the commencement of mining activities. Insect fauna, such as termite and cocktail ant nests, will be eliminated. It is uncertain (unlikely) whether rehabilitation of the mining site will create a suitable habitat for indigenous fauna post mining.

Table 3: Impact on fauna

	Extent	Intensity	Duration	Consequence	Probability	Significance
Construction and Operational Phase						
Without Mitigation	Local 1	Medium 2	Long- term 3	Medium 6	Probable 3	LOW-MEDIUM
With mitigation	Local 1	Medium 2	Long-term 3	Low 5	Probable 3	LOW

1.2 Exposure to erosion

The removal of surface vegetation, whether natural or disturbed, will expose the soils, which in rainy events would wash down into proximate moist grasslands/wetlands, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive plant species will spread easily into these eroded soils.

Table 4: Exposure to erosion significance rating

	Extent	Intensity	Duration	Consequence	Probability	Significance
Construction Phase						
Without mitigation	Local 1	Medium 2	Long – term 2	Medium 6	Probable 3	MEDIUM
With mitigation	Local 1	Medium 2	Medium term 2	Low 5	Possible 3	VERY LOW
Operational Phase						
Without mitigation	Local 1	Medium 2	Long term 3	Medium 6	Probable 3	MEDIUM
With mitigation	Local 1	Medium 2	Medium term 2	Low 5	Possible 2	VERY LOW

1.3 Soil compaction

The movement of heavy machinery over vegetated areas will result in soil compaction that will modify habitats, destroy vegetation and inhibit re-vegetation. Soil compaction as a result of vehicles and traffic, could lead to a decrease of water infiltration and an increase of water runoff. Such areas are more likely to be colonised by pioneer, alien invasive plant species, than indigenous species. This will further transformed the vegetation of the area.

Table 5: Significance of soil compaction significance rating

	Extent	Intensity	Duration	Consequence	Probability	Significance
Construction Phase						
Without mitigation	Local 1	Medium 2	Long – term 3	Medium 6	Probable 3	MEDIUM
With mitigation	Local 1	Low 1	Medium – term 2	Very low 4	Possible 2	INSIGNIFICANT

1.4 Heritage

Archaeology

Indications are that proposed mining of the ± 34ha dolomitic ore reserve on Farm Welverdiend No. 511, as well as construction and operation of a large plant facility, will impact negatively on archaeological heritage that will result in the irreversible loss and destruction of archaeological resources.

The majority of the archaeological resources documented during the study have been rated as having low (Grade 3C) significance, but Sites 3191, 3231, 3251, 3261, 3281, 3291, 3301, 3312, 3321, 3331, 3351, 3361, 3371, 3381, 3401 & 3421 in the proposed Plant Area have been graded as having potentially medium (Grade 3B) because of the context in which the finds were made (i. e. stone tool production areas). These in situ sites are mostly associated with heuweltjies, on older land surface that are dotted around the proposed logistical facility (Figure 1).

Measures to ensure the protection and conservation of potential Grade 3B archaeological heritage remains associated with heuweltjies areas are proposed.

Mitigation action proposed includes the preparation of a Development Heritage Management Plan (DHMP) to manage the activities and phases of development that may impact heritage resources within the application area (Higgitt 2017), establishment of buffer zones around potentially sensitive archaeological areas (e. g. Sites 0592, 0632, 0652, 0682 & 0692), and monitoring of mining and site operations.

Although large numbers of archaeological resources (i. e. stone tools) were encountered throughout the study area, they are of limited importance due to their poor context. The resources are consistent with the distribution of surface remains in the Knersvlakte region, where most of the occurrences encountered appear to be dominated by implements of mixed age, on eroded surfaces below the top soils.

While the study has captured a good record of the archaeological record present on the proposed development site, no occupation or settlement sites were recorded and the majority of the remains most likely represent flakes and flakes debris.

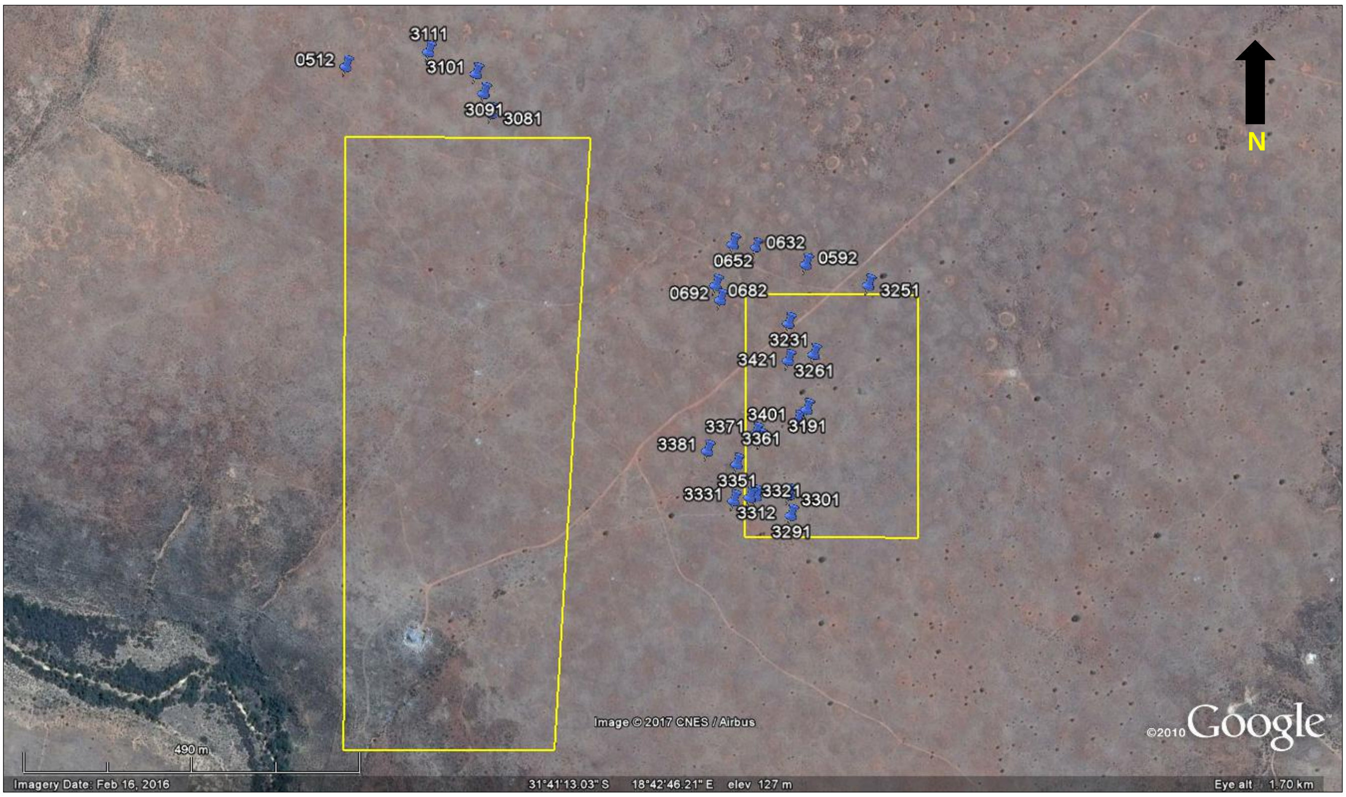

Figure 1: Sites rated as having medium (Grade 3B) significance

Table 6: Impact significance on archaeological resources

	Extent	Intensity	Duration	Consequence	Probability	Significance
Construction and Operational Phases						
Without mitigation	Local 1	High 3	Medium term 2	Medium 6	Definite 3	VERY HIGH
With mitigation	Local 1	High 2	Permanent 4	Very high 9	Probable 3	MEDIUM

Palaeontology

According to Almond (2017), most of the proposed mining development area is covered by a thin veneer of Late Caenozoic superficial sediments that are underlain by ancient Precambrian rocks, some of which might contain fossil remains. The Late Precambrian carbonate bedrocks of the Widouw Formation (Gifberg Group, Gariep Supergroup) are metamorphosed, recrystallized and highly deformed, and therefore `very unlikely to contain any fossils' (Almond 2017:1).

Almond (2017) notes that there have been previous reports of sizeable stromatolites (fossil microbial mounds) within the Widouw Formation near Vredendal, some 10km or so to the east of the proposed new mine, but these records could not be confirmed.

Almond (2017:18) states that `no fossil remains of any sort' were recorded from any of the superficial sediments observed during the recent site visit to Farm 511 Welverdiend 511 (river alluvium, surface and subsurface gravels, sandy soils). The carbonate bedrocks are largely mantled by a range of Late Caenozoic superficial deposits (wind-blown sands, sandy soils, gravels, silcrete and calcrete pedocretes & alluvium) that are up to 2m thick and `all of low palaeontological sensitivity'.

Table 7: Impact significance on Palaeontology resources

	Extent	Intensity	Duration	Consequence	Probability	Significance
Construction and Operational Phase						
Without Mitigation	Local 1	High 3	Long- term 3	Medium 6	Probable 3	MEDIUM
With mitigation	Local 1	Medium 2	Long-term 3	Low 5	Possible 2	VERY LOW

Early Stone Age (ESA) and Middle Stone Age (MSA)

According to a study conducted by Dr Foreman Bandama (2017), a total of 14 sites with 34 scatters were recorded but it should be noted that because of the significant admixture, the site boundaries are mere estimates and the significance of the sites is diminished from possible grade IIIB to IIIC. These 14 sites produced 823 lithics, 44 (5%) of which are informal tools (cores and flake cores). Six of these (Site 1, 7-11 and 13) are located on the development footprint for the proposed extension of the limestone mine, while only 1 (Site 14) is located within the proposed area for kiln site. The other six are outside the proposed development footprint, but will nonetheless be affected by the mining and construction operation due to their proximity.

Dr Bandana further indicates that the observation that the sites and lithic scatters were mixed up during tillage is very significant in terms of the subsequent approach to the study, as well as the significant assessment. The majority of the studied are predominantly MSA in character but ESA and LSA material are also represented. The presence of chunks (cores) at several sites intimates that some of the sites were production centres but the subsequent farming activities have robbed these potential IIIB sites of their significance. In their current state, none of the studied sites are particularly special, even though the material still has some teaching value.

The area is deemed to be clear of significant archaeological resources, and it is recommended that mining can proceed, if any human remains or accumulations of archaeological material are discovered during construction or mining activities, work should stop immediately and the finds must be reported to HWC. The procedure for reporting chance finding must be clearly followed.

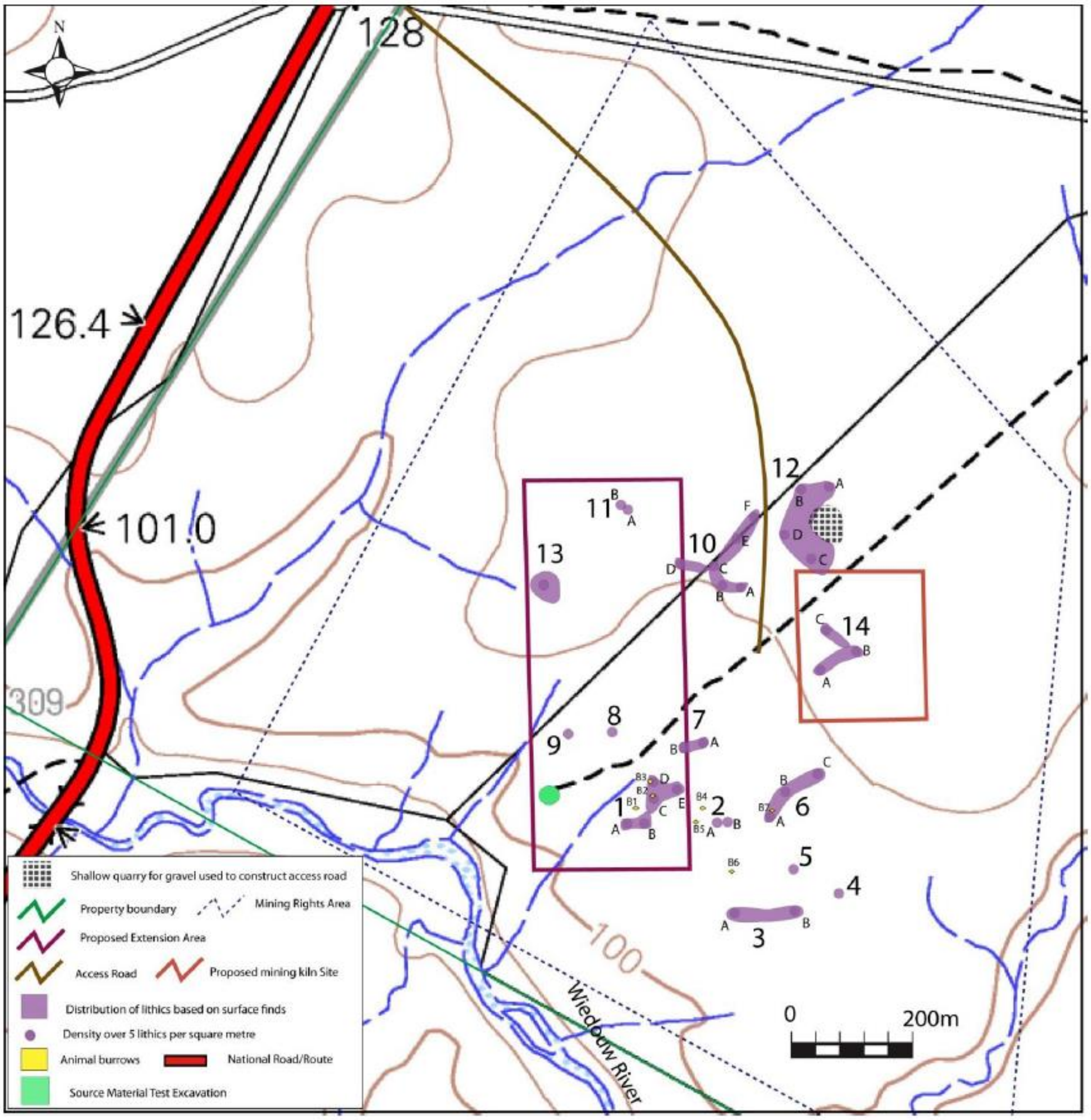

Figure 2: Stone Age sites in relation to the proposed developments

Table 8: Impact significance on ESA and MSA

	Extent	Intensity	Duration	Consequence	Probability	Significance
Construction and Operational Phase						
Without Mitigation	Local 1	High 3	Long- term 3	Medium 6	Probable 3	MEDIUM
With mitigation	Local 1	Medium 2	Long-term 3	Low 5	Possible 2	VERY LOW

1.5 Impact on ambient noise

The proposed activities will contribute to noise in the receiving environment.

Construction Phase

The following activities during the construction phase are identified as possible noise sources;

- Offloading of construction materials;
- Excavations and backfilling where required;
- Concrete mixing and batching;
- Use and maintenance of roads;
- Machinery noise from construction related activities

The construction machinery will be a source of continuous noise throughout the construction phase. Offloading of construction materials and clearing the bins of the loader trucks contribute to increased ambient noise. Excavation machinery and backfilling where required of excavations also result in noise pollution. Concrete mixing and batching especially when coarse stone material is being mixed result in increased noise levels. Vehicle use and maintenance of roads would result in engine noise as well as wheel noise on the hardened surfaces. Construction of the associated infrastructure in support of the proposed operations all require various forms of construction equipment to be used which could potentially result in higher than usual ambient noise levels to be experienced during this phase.

Table 9: Construction phase impact significance

	Extent		**Intensity**	**Duration**	**Consequence**	**Probability**	**Significance**
	Construction Phase						
Without Mitigation	Local 1		Medium 2	Short-term 1	Very Low 4	Definite 4	VERY LOW
With mitigation	Local 1		Low 1	Short-term 1	Very Low 3	Probable 3	VERY LOW

Operational Phase

The following activities during the operational phase are identified as possible noise sources;

- Use and maintenance of haul roads (incl. transportation of material to plant and offsite),
- Removal of aggregate material (mining process) and stockpiling,
- Intermitted blasting,
- Machinery and excavation noise,
- Use and maintenance of conveyors,
- Crushing and screening,
- Trucks clearing their load bins before loading,

- Vehicle travelling to and from site on a daily basis.

The operational machinery will be a source of continuous noise throughout the operational phase. The crushing and screening activities during operational phase are identified as the highest noise producing source. Dump mining fleet vehicles working on loading and transporting of clinker-bearing material also result in increased noise. Clearing of bins when trucks enter the loading facility also result in ambient noise increasing. Various vehicles travelling on the access road leading to the offices and main operational complex will also contribute to ambient noise levels increasing. Conveyors also contribute to noise, although there's minimal noise sensitive receptors in the vicinity of this infrastructure.

Table 10: Operational phase impact significance

	Extent		**Intensity**	**Duration**	**Consequence**	**Probability**	**Significance**
	Operational Phase						
Without Mitigation	Local 1		Medium 2	Long-term 3	Medium 6	Definite 4	MEDIUM
With mitigation	Local 1		Medium 2	Long-term 3	Long- term 3	Probable 3	MEDIUM

Decommissioning and Closure Phases

The following activities during the decommissioning phase are identified as possible noise sources and may impact on the ambient noise level at the relevant noise sensitive receivers:

- Demolition and Removal of all infrastructure (incl. transportation off site),
- Reshaping of the area that was mined,
- Rehabilitation - spreading of soil, re-vegetation & profiling/contouring with heavy machinery,
- Aftercare and maintenance of rehabilitated areas.

The machinery involved with the above-mentioned activities will be a source of continuous noise throughout the decommissioning and closure phase. The results will be similar to that of the construction phase with regards to the expected noise levels, therefore it is probable that the noise from the proposed mining activities will be similar or lower to that of the current ambient noise levels at the indicated noise sensitive receivers.

Table 11: Decommissioning phase impacts

	Extent		Intensity	Duration	Consequence	Probability	Significance
	Operational Phase						
Without Mitigation	Local 1		Medium 2	Short-term 1	Very Low 4	Probable 3	VERY LOW
With mitigation	Local 1		Low 1	Short-term 1	Very Low 4	Probable 3	VERY LOW

1.6 Socio-economic impacts

New projects are known to bring changes to their surrounding human populations. It is therefore important that such changes be studied in detail to determine the impact the project will bring. The social and labour plan project will initiate Local Economic Development Programmes for the nearby community since in an effort to boost the socio-economic status of the area.

It is anticipated that 26 people will be employed at the commencement of operations and this will be a combination of permanent skilled operators and local workers will be employed at the site. The workforce will increase as each kiln is required to be brought into production. Mining and crushing will involve 10 employees. The first kiln will require 16 employees and each additional kiln 12 per kiln. Maintenance, laboratory, sales and weighbridge and management will be 16 employees. In full production a total of 78 employees is envisaged.

Table 12: Significance of creation of employment and income

	Extent	Intensity	Duration	Consequence	Probability	Significance
Operational Phase						
Without mitigation	Local 1	Medium 2	Medium term 1	Low 5	Probable 3	MEDIUM (Positive)
With mitigation	Local 1	Low 1	Medium term 1	Low 5	Definite 4	HIGH (Positive)

Table 13: Visual impact associated with the proposed operations

	Extent	Intensity	Duration	Consequence	Probability	Significance
Operational Phase						
Without mitigation	Local 1	High 3	Medium term 2	Medium 6	Definite 3	MEDIUM
With mitigation	Local 1	High 1	Permanent 4	Very high 9	Probable 3	VERY HIGH (Positive)

Table 14: Potential safety impacts associated with crush machinery and movement of vehicles

	Extent	Intensity	Duration	Consequence	Probability	Significance
Operational Phase						
Without mitigation	Local 1	High 3	Medium term 2	Medium 6	Probable 3	MEDIUM
With mitigation	Local 1	Medium 1	Medium term 3	Low 5	Probable 3	LOW

Socio-economic Cumulative impacts

Positive Cumulative Impacts

- Creation of permanent employment and skills and development opportunities for members from the local community and creation of additional business and economic opportunities in the area.
- Promotion of social and economic development and improvement in the overall well-being of the community
- At the completion of the project, the aesthetic value of the site will be restored as the site will not be having at ash dump any more.

Negative Cumulative Impacts

- Long term exposure of the workers to dust and uncontrolled emissions from the kils could give rise to potential illness in a long run.

1.7 Air Quality

Fugitive Emissions (area and or line sources)

Construction Phase

The construction phase of the project is anticipated to last for 12 months. The working hours will be 9 hours a day, 5 days a year. The construction phase will comprise site preparation and construction of all mine-related infrastructures. A construction camp, which includes an office complex, workshops, storage, etc., will be established during the construction phase.

Key activities that will be undertaken during the construction phase include:

- Construction of an access road;
- Pre-stripping;
- Site clearance;
- Earthmoving, grading, compaction, terracing;
- Construction of bulk services facilities (i.e. power infrastructure, waste facilities,
- stormwater control and water supply system);
- Construction of civil works (including all mine infrastructures and facilities);
- Construction of structures;
- Installation of equipment; and
- Commissioning.

Large equipment expected to be utilised during the construction are:

- Cranes,
- Excavators,
- Trucks,
- Front-end Loaders,
- Bulldozers, and
- Graders.

Depending on the daily-specific construction activities, dust emissions during the construction phase may vary significantly from day to day. Since the sequence and level of activities during construction are not known at this stage of the project, the emissions and impact will be assessed qualitatively.
In general, it is known that the emissions from the construction phase are normally much lower than those during the operational phase. The construction phase emission impact is expected to be short-term and localised to the working face and access road.

Operational Phase

The main fugitive emissions during the operational phase are dust and suspended particulate matter emitted from the vehicle movements on paved and unpaved roads, the aggregate handling and storage piles, the operations of the excavators, graders, truck loading and offloading, as well as wind erosion of exposed areas.

The emissions from the mining and ore processing operations are often estimated with emission factors that are available internationally.

Mining Operations

The open pit strip mining method will be utilised at the mine. With this method, the overburden is removed to expose the ore and after that drilling and blasting take place according to a structured mining plan.

Crushing and Screening

Crushing operations, if uncontrolled, may be significant dust-generating sources. Dust fallout in the vicinity of crushers also gives rise to the potential for the re-entrainment of dust emitted by vehicles or by the wind. The large percentage of fines in this dust fall material enhances the potential for it to become airborne.

According to the mine engineers, a water spraying system will be integrated into the crushing plant to control and minimize dust generation. And the secondary crusher will be fitted with fabric filters. Control efficiencies of 50% and 83% were thus applied in the emission calculations for the primary and secondary crushing respectively.

Aggregate Handling and Storage Piles

The particulate emissions from the stockpiles can result from the following activities:

- Loading of aggregate onto storage piles (batch or continuous drop operations);
- Equipment traffic in the storage area;
- Wind erosion of pile surfaces and ground areas around piles;
- Loadout of aggregate for backfilling.

Unpaved Road Emissions

When a vehicle travels an unpaved road, the force of the wheels on the road surface causes particles to be lifted and dropped from the rolling wheels. The road surface is exposed to strong air currents in turbulent shear with the surface, as well as the air wake behind the vehicle. The quantity of dust emissions from a given segment of the unpaved road varies linearly with the volume of traffic.

Wind Erosion

The emission factor for wind erosion of an exposed area is given as 0.85 Mg of TSP per hectare per year (USEPA). The estimated exposed area of 2 hectares was used in the calculation of emissions due to wind erosion. There is no PM_{10} emission factor specified for wind erosion. However, it is assumed that 40% of the TSP emission is in the PM_{10} range.

The expected air quality impacts of the proposed mine were quantified via dispersion modelling. The impact ratings are summarised in Table 14 below. The impact rating methodology can be found in **Appendix A**.

Based on the dispersion modelling results, the daily dust deposition, as well as the ambient concentrations of PM_{10}, NO_2 and CO, were well within their respective guidelines. Therefore, based on the above-mentioned methodology, the extent of the impact is considered ***local***. The duration of the impact and the impact phase will be ***long-term***. The ambient air quality is likely to be *negatively* affected, with **low consequence.** The probability of the impact occurring was considered ***probable***. Based on the provided methodology rating system, the resulting overall impact rating is ***Low***.

Based on the modelling results, no additional mitigation measures are considered necessary, other than those indicated in the emission calculation sections. As such, no separate mitigated impacts were assessed.

Table 15: Operational Impact

	Extent	**Intensity**	**Duration**	**Consequence**	**Probability**	**Significance**
Operational Phase						
Without mitigation	Local 1	Low 1	Long term 3	Low 5	Probable 3	LOW
With mitigation	Not applicable					

<u>Cumulative Impacts</u>

Air quality

The mining activities will result in dust nuisance caused by excavations, stripping and stockpiling of top soil, loading and transportation of sand by trucks to clients.

<u>Geohydrology</u>

Depletion of the Groundwater Resource as a Result of Mining Operation:

The proposed mining area will not intersect any groundwater as it will take place by means of surface drilling and blasting up to a maximum depth of 60 mbgl. No groundwater abstraction will take place on the mining site at this stage, hence impact on other groundwater users due to abstraction. The depletion of the groundwater resource as a result of the abstraction is thus highly improbable to occur.

Table 16: Risk assessment for the depletion of the groundwater resource as a result of the mining operation.

	Extent	**Intensity**	**Duration**	**Consequence**	**Probability**	**Significance**
Operational Phase						
Without mitigation	Local 1	Medium 2	Medium-term 3	Low 5	Possible 2	Moderate 8
With mitigation	Local 1	Low 1	Short-term 2	Very Low 4	Improbable 1	Low 3

Groundwater Quality Deterioration as intersecting groundwater and point and non-point source pollution:

Intersecting of groundwater during excavations and point source pollution can potentially result in the deterioration of groundwater quality and lowering of pH conditions in groundwater which might also impact the Karst aquifer resulting in dissolution cavities. The groundwater quality as indicated by DWAF (2000) for the area is marginal (70 – 300 mS/m). The groundwater quality for boreholes on site are within this range of the regional classification. The proposed mining operations and associated activities are highly improbable to impact the groundwater and groundwater quality if proper mitigation measures are in place and if the applicant adheres to the recommendations

Groundwater monitoring is recommended to ensure that mining operation does not negatively impact groundwater levels, hence intersecting groundwater or cause deterioration of groundwater quality. The monitoring will also indicate if the groundwater resource is impacted and mitigation measures can be instituted before long term impacts occur. Mitigation includes not deviating from the original planned excavation depth and having mitigation measures in place preventing point source pollution.

Table 17: Risk assessment for the groundwater quality deterioration as a result of over abstraction

	Extent	**Intensity**	**Duration**	**Consequence**	**Probability**	**Significance**
Operational Phase						
Without mitigation	Local 1	Medium 2	Medium-term 3	Low 5	Possible 2	Low
With mitigation	Local 1	Low 1	Short-term 2	Very Low 4	Improbable 1	Low

Agricultural Impact Assessment

It is inevitable that the proposed material extraction process will permanently impact on the site, not only during the life of the mine, but also after the closure of the mine as extracted material is removed from the site for processing. Due to extremely shallow nature of the topsoil there is surplus material available for topdressing mined areas. This is an inherent component of any opencast mining operation, particularly in areas without readily available topsoil. The social offset in this instance is not only the creation of employment at the site but also downstream employment in transport, kilns, administration and marketing. The economic offset is a contribution to Gross Domestic Product (GDP) from land that previously contributed nothing. Ecological damage to the Surface Working Area (SWA) of the site in the form of offices, accommodation, roads and material storage can be repaired once the life of mine has expired. Apart from nuisance dust, the material extraction process and activities in the SWA will have no impact, either positive or negative on the remainder of the Maskam property or the adjoining land parcels.

Impact on extraction site

Impact on the material extraction site will be long term, irreversible and severe. The impact on the surface working area will also be long term, but reversible and moderate. For the purpose of the table below, values derived from the material extraction site are used. The entire operation takes place within the context of presently vacant, unutilized arid rangeland that employs nobody. The long term economic and social benefits are positive in that food security will be provide for a number of families in the form of permanent employment.

Table 18: Impact on extraction site

	Extent	**Intensity**	**Duration**	**Consequence**	**Probability**	**Significance**
Operational Phase						
Without mitigation	Local 1	Medium 2	Long-term 3	Very High 9	Definite 4	High
With mitigation	Local 1	Medium 2	Long-term 3	Very High 9	Definite 4	High

Residual Impacts

The material extraction area can never be fully rehabilitated as the extracted material is removed from the site for processing elsewhere and therefore cannot be used as backfill. Areas where vegetation has been removed or damaged should be lightly ripped with a vlegploeg or similar implement in order to release buried seed and organic material. Locally collected seeds may be added. Re-colonisation will occur rapidly after the first rain. Other residual impacts are civil engineering and safety concerns etc. that will be addressed by others

Cumulative Impacts

The Nature of the Cumulative Impact Impact on the material extraction site is within the context of arid rangeland and even more arid mountains that extend from horizon to horizon. Apart from the existing N7 National Highway which passes by approximately 1.5 km away, there is no other development within 10 km of the site.