
ELITHENI DOLERITE PIT



ENVIRONMENTAL MANAGEMENT PLAN



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

This report is undertaken in compliance with Section 39 and Regulation 52 of the Mineral and Petroleum Resources Development Act, Act 28 of 2002, and in accordance with the Standard Directive for the compilation thereof as published on the official website of the Department of Mineral Resources. All text in *italics* within this report are quoted *verbatim* from the Standard Directive.

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TABLE OF CONTENTS

1	REGULATION 52 (2) : DESCRIPTION OF THE AFFECTED AREA	4
1.1	BASE LEVEL ENVIRONMENT.....	4
1.1.1	<i>Assessment of environment affected by alternative land use</i>	6
1.1.2	<i>Geology</i>	7
1.1.3	<i>Climate</i>	7
1.1.4	<i>Topography and Soils.....</i>	8
1.1.5	<i>Fauna & Flora</i>	9
1.1.6	<i>Surface Water.....</i>	10
1.1.7	<i>Groundwater</i>	12
1.1.8	<i>Heritage Sites.....</i>	14
1.1.9	<i>Paleontological Sites</i>	14
1.1.10	<i>Social Environment.....</i>	14
1.2	CRITICAL ENVIRONMENTAL FEATURES.....	16
1.3	LOCALITY MAP	16
1.4	COMMUNITY INVOLVEMENT	16
2	REGULATION 52 (2) (B) : ASESMENT OF THE POTENTIAL IMPACTS	17
2.1	DESCRIPTION OF THE PROPOSED MINING OPERATION	17
2.1.1	<i>Main Activities</i>	17
2.1.2	<i>General Mining Plan.....</i>	19
2.1.3	<i>Project Plan by Phases.....</i>	19
2.1.4	<i>Listed Activities</i>	20
2.2	IDENTIFICATION OF POTENTIAL IMPACTS AS PER GUIDELINE.....	21
2.2.1	<i>Individual Impacts.....</i>	21
2.2.2	<i>Cumulative Impacts.....</i>	22
2.2.3	<i>Heritage Impacts.....</i>	22
2.2.4	<i>Impacts on communities, individuals or competing land uses.</i>	22
2.2.5	<i>Impacts part of IAP process</i>	23
2.2.6	<i>Confirmation of specialist report appended</i>	23
3	REGULATION 52 (2) (C) : SUMMARY OF THE ASSESSMENT	23
3.1	IMPACT ASSESSMENT	23
3.1.1	<i>Assessment Criteria.....</i>	23
3.1.2	<i>Impact Assessment.....</i>	24
3.1.3	<i>Cumulative Impacts.....</i>	31
3.2	MITIGATION MEASURES	31
3.2.1	<i>Critical Activities.....</i>	31
3.2.2	<i>Technical or Management Options.....</i>	31
3.2.3	<i>Impacts after Mitigation</i>	31
4	REGULATION 52 (2) (D) : FINANCIAL PROVISION	34
4.1	PLANS FOR QUANTUM CALCULATION PURPOSES	34
4.2	ALIGNMENT OF REHABILITATION WITH THE CLOSURE OBJECTIVES	34
4.3	QUANTUM CALCULATIONS	36
4.4	UNDERTAKING TO PROVIDE FINANCIAL PROVISION	38
5	REGULATION 52 (2) (E) : PLANNED MONITORING	38
5.1	IMPACTS TO BE MONITORED	38
5.2	MONITORING REQUIREMENTS	39
5.3	ROLES & RESPONSIBILITIES	40
5.4	MONITORING INTERVALS	40
6	REGULATION 52 (2) (F) : CLOSURE OBJECTIVES	40
6.1	REHABILITATION PLAN	40
6.2	CLOSURE OBJECTIVES	41
6.3	CONFIRMATION OF CONSULTATION	42
7	REGULATION 52 (2) (G) : PUBLIC PARTICIPATION RECORDS	42

7.1	IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES	42
7.2	ENGAGEMENT PROCESS	43
7.2.1	<i>Information Provided</i>	43
7.2.2	<i>List of IAP's Consulted</i>	43
7.2.3	<i>Base Level Environment as viewed by IAP's</i>	43
7.2.4	<i>Impacts as viewed by IAP's</i>	44
7.2.5	<i>Other Concerns</i>	44
7.2.6	<i>Appended Minutes & Records</i>	44
7.2.7	<i>Objections Received</i>	44
7.3	ISSUES ADDRESSED	45
8	SECTION 39 (3) (C) : ENVIRONMENTAL AWARENESS PLAN	46
8.1	EMPLOYEE COMMUNICATION PROCESS	46
8.2	DESCRIPTION OF SOLUTIONS TO RISKS	47
8.3	ENVIRONMENTAL AWARENESS TRAINING	50
9	SECTION 39 (4) (A) (III) : REHABILITATION CAPACITY.....	50
9.1	THE ANNUAL AMOUNT REQUIRED TO MANAGE AND REHABILITATE THE ENVIRONMENT.	50
9.2	CONFIRMATION OF FINANCIAL PROVISION.	51
10	REGULATION 52 (2) (H) : UNDERTAKING TO ADHERE TO EMP	51
10.1	ANNEXURE 1 : LETTER FROM THE LAND SURVEYOR CONFIRMING STATE LAND	52
10.2	ANNEXURE 2 : B002-007 A3 LOCAL PLAN INDICATING THE LAND USES	53
10.3	ANNEXURE 3 : B002-006 A3 MINING PLAN INDICATING THE MINING BENCHES	54
10.4	ANNEXURE 4 : B002-008 A3 REHABILITATION PLAN INDICATING THE MINE CLOSURE STATUS	55
10.5	ANNEXURE 5 : IAPS CONSULTATION DOLERITE PIT FINAL REPORT	56
10.6	ANNEXURE 6 : FINDINGS OF PUBLIC PROTECTOR RE. GUBA TRUST & ELITHENI	57
10.7	ANNEXURE 7 : MINUTES OF MEETING HELD WITH GUBA TRUST AND THEIR RESPONSE.....	58
10.8	ANNEXURE 8 : PALAEONTOLOGICAL IMPACT ASSESSMENT	70
10.9	ANNEXURE 9 : ARCHAEOLOGICAL IMPACT ASSESSMENT	71

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

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1 REGULATION 52 (2) : DESCRIPTION OF THE AFFECTED AREA

1.1 Base Level Environment

Describe the environment on site relative to the environment in the surrounding area.

Elitheni Dolerite Pit (belonging to Elitheni Coal (Pty) Ltd) is located more or less at latitude 31° 31' 51" S and longitude 27° 16' 30" E within the Chris Hani District Municipal Area. The mine is situated approximately 10 km south west of the closest town : Indwe, in the Emalahleni Local Municipality, which is the Regional Services Council authority. Other communities in the area are Dordrecht about 30 km west ; Cala about 25 km South East ; and Lady Frere about 35 km South. The mining area is accessed via existing gravel roads (DR02829 & DR08598) off the R56 between Dordrecht and Indwe.



Figure 1 : Locality of Indwe in relation to the greater Eastern Cape Province of South Africa.

The mine's 1½ hectares of land is situated on State Land, all situated in the Machubeni area as indicated below.

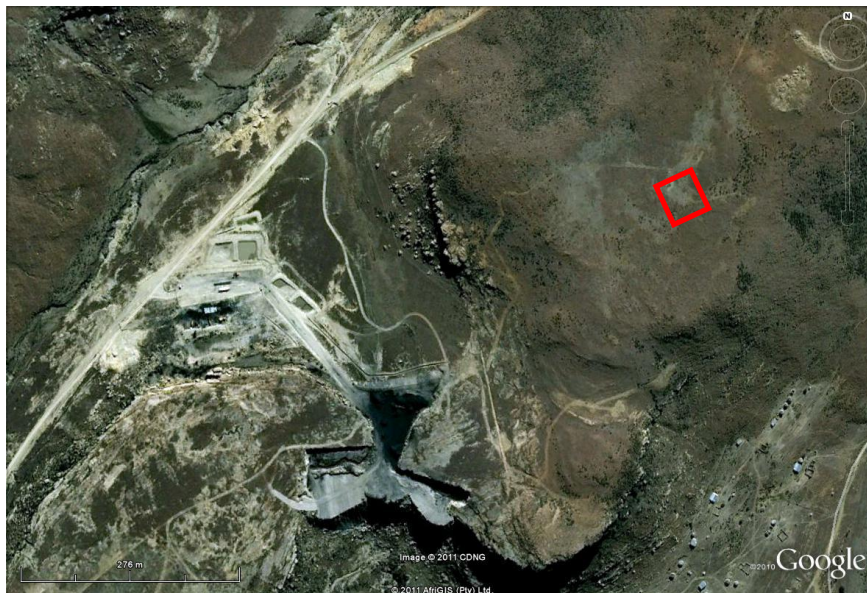


Figure 2 : Locality of Elitheni Dolerite Pit as shown on a Google Earth © image.

The surrounding area is on average between 1450m to 1500m above mean sea level. The Doringrivier Dam is located next to Indwe and has a capacity of 17.9 million cubic meters. No heavy industries are currently located in the area. Almost all of the commercial activities in the area comprise commercial and subsistence farming and related services, with Indwe serving the local community. Indwe has an unpaved landing strip (length 885m) that is able to serve small planes. No refuelling or hangar facilities are available at present.

There exists no title deed of the land as it is former State Land, which currently belongs to the Department Of Rural Development & Land Reform. The land is therefore described as : “ **Machubeni 3 Allotment area in the Glen Grey district of the former Transkei** ”. See Annexure 1 : Letter from the Land Surveyor confirming State Land, for a letter from a registered Land Surveyor confirming it as such. Only a portion of this state land (less than 1 hectare on surface) comprises the site.

The Xhosa speaking Guba-Machubeni community greatly concern themselves with subsistence farming. Lately some emerging farmers with greater economic motivation have come to the forefront. The site where mining is intended is elevated high above the residential areas of the communities and can be accessed only by foot as no roads exist that lead to the mining area. There are no sites of heritage importance that could be affected by the mining project. Currently the area is being used by subsistence farmers as grazing veldt for small livestock such as goats. The area has no cultivated land, no paddocks, but the natural vegetation is used as pasture & feeds.

The study area contains no endangered - or vulnerable faunal - & floral species as listed in the Red Data Book. The topsoil is very shallow mispah soils and the mining impact is temporary and localised only for the duration of the mining project. Due to the deep water table water resources would not be affected by the mining venture, but seeing that the quarry would be located on top of a hill, the quarry has the potential upon mine closure to serve as a water reservoir catching stormwater. This water reservoir could be utilised either as a reservoir for human consumption, or as a waterhole for the drinking of animals. The flat topography on top of the mountain would not be affected as the original ground level of the mining area is on level ground and all communities and roads in the area are located on lower elevations to that of the mine. Due to the height of the mine in relation to communities and the dissipation of noise upwards, no noise impact is expected created by the mining operations.

1.1.1 Assessment of environment affected by alternative land use

The mining area is located within the rural district of the Emalahleni Local Municipality in the north-eastern portion of the Chris Hani District Municipal area of the Eastern Cape. The site is located ~10 km south west of the town of Indwe, ~30 km west of Dordrecht, ~25 km south east of Cala, ~35 km north of Lady Frere. The mining area is accessed via existing gravel roads (DR02829 & DR08598) off the R56 between Dordrecht and Indwe. The mining area is currently situated on State-owned land (Department of Rural development and Land Reform) and is zoned as rural

agricultural. As such, the site is surrounded by agricultural activities (mainly grazing) and rural villages.

1.1.2 Geology

The geological conditions as indicated on the published 1:250 000 scale geological map (3126 Queenstown) suggest that most of the study area is underlain by mudstone and sandstone of the Molteno Formation of the Karoo Supergroup. A dolerite extrusion in the form of a dyke exist and becomes the target mineral. The stratigraphy can be tabled as follows :

Age	Sequence	Group	Subgroup	Formation	Lithology
Quaternary					Alluvium
Jurassic					Dolerite
Triassic	Karoo			Molteno	Grey mudstone, shale, gritty sandstone, occasional coal seams
Triassic	Karoo	Beaufort	Tarkastad	Burgersdorp	Brownish red and grey mudstone, sandstone

The Molteno sediments occur mainly in the higher lying areas, where coal seams are overlain by massive Molteno sandstone and dolerite sills. The Burgersdorp Formation underlies the coal seams and outcrops in the valley / low lying areas. Large dolerite sills and limited dykes of Jurassic age have intruded both Karoo Sequence formations. During the intrusion, fracturing of the Karoo sediments would have occurred, leading to preferential groundwater flow paths. Numerous dolerite dykes and sills have intruded into these sedimentary rocks during the break up of Gondwanaland with outcrop generally restricted to the higher-lying topography. Alluvium, associated with surface water drainage, overlies the Karoo rocks. Alluvial cover material has been deposited along the larger drainage channels to the north and north-east of this area. Topsoil above the old underground workings area is on average < 500 mm.

1.1.3 Climate

The mountainous terrain enjoys extreme Steppe climatic conditions, which implies that temperatures in excess of 10°C occur for less than 8 months of the year with a winter dry spell of at least 2 months where precipitation values of less than 60 mm occur. According to the South Africa Weather Bureau, relatively harsh climatic conditions prevail in the study area. Rainfall varies between 500 mm and 550 mm per annum, with a precipitation maximum during the summer months. Weinert's climatic N number is approximately 5,2 implying that mechanical weathering marginally dominates over

chemical weathering. The mechanical weathering conditions will be dictated to by extreme nocturnal and diurnal temperature fluctuations. The mean annual run-off generated in the area is approximately 25 mm to 50 mm per annum. The surface run-off in the region is, therefore, only about 10% of the annual precipitation. The mean annual evaporation value for the area is approximately 600 mm p.a.

Summer (January) temperatures vary from an average maximum of ~22°C to an average minimum of ~15°C. Winter (July) maximum and minimum temperatures are about 11°C and 3°C respectively. Extreme maximum temperatures of up to 40°C were recorded in the area (1966), while minimum temperatures below freezing have been recorded on several occasions (1968, 1974, 1975, 1977).

The dominant wind directions are from the north-west and south-east with a minor westerly and easterly component also occurring. Calm conditions are experienced for ~18% of the year (i.e. ~66 days).

1.1.4 Topography and Soils

The broader surrounding area is characterised by undulating topography and rolling hills, with the natural topography in the immediate vicinity of the abandoned opencast mine having been previously disturbed through historic mining activities. The broad soil classification is based on the standard agricultural taxonomic system. Soil families would range from areas where very shallow bedrock prevails with a thin soil cover (e.g. Mispah Form) to areas outside the mining permit area where very deep soil profiles occur with completely weathered bedrock conditions (e.g. Arcadia Form). The soils in the Indwe area are dictated to by the underlying geology, the topography and regional climatic conditions. The mining area is predominantly characterised by a thin topsoil horizon overlying dolerite and sandstone.



Figure 3 : The site viewed towards the East (left) and towards the West (right).



Figure 4 : The site viewed towards the North (left) and towards the South (right).

1.1.5 Fauna & Flora

The broader study area falls within the intermediate zones of two distinct regions of endemism, i.e. the Albany Centre in the south-west and the Drakensberg Alpine Centre to the north-east. The study area is located within the Tsomo grassland vegetation type (Mucina & Rutherford, 2006). Shrubs, herbs and trees tend to be restricted to hilltops, rocky outcrops and along watercourses within the broader study area. Hilltops tend to have exposed rocky outcrops, which provide fire refuges and often have a proliferation of stunted shrub, herb and succulent species, where soil has accumulated.

The site is situated on top of a flat sandstone layer overlaying the coal seam. The central portion of the sandstone layer and surrounded areas are vegetated by typical Tsomo grassland, where sufficient soil depth permits. The exposed sandstone outcrop tends to be relatively sparse in characteristic Tsomo Grassland vegetation but is rather vegetated with a range of succulent species.

No protected plants of conservation importance have been recorded on the study area. However, succulent species of the families *Mesembryanthemaceae* and *Crassulaceae* have been recorded on the rocky outcrops and ridge lines within the broader study area. The potential for these species occurring is, however, reduced due to the area suffering past disturbance due to historical livestock grazing.

Alien species noted in the broader area include *Opuntia ficus-indica* (Sweet Prickly Pear) and *Cirsium vulgare* (Canada Thistle), both of which are declared as category 1

weed species in the CARA Regulations. Yet, no alien vegetation occur within the mining permit area.

The occurrence of fauna is largely related to habitat availability. Habitats which are present within the proposed mining area include grassland (to a limited extent) and rocky refuges. Small mammals (such as rodents) and reptiles (such as lizards and snakes) are likely to be associated with these respective habitats.

1.1.6 Surface Water

The study area is located within quaternary catchment S20B. Springs originate within the net catchment area and these springs feeds into the Nomaguana River. The Nomaguana River is classified as a perennial stream (Geographical Information System- GIS 3.2 data files).

a) Catchment Hydrology

A catchment area is usually, but not necessarily, bounded by the topographic water-divide. It is appropriate to consider how various properties of the catchment area affect the rate and quantity of discharge from it. The catchment area is the whole of the land and water surface area contributing to the discharge at a particular stream or cross section, from which it is clear that every point on a stream channel has a unique catchment of its own, the size of the catchment increasing as the control point moves downstream.

b) Nett Catchment Area

The net catchment area is not determined by the study area only but by the drainage lines. The net catchment area is the area that may be impacted by the earthmoving activities. Topographical maps were used to determine the Net Catchment Area.

c) Mean Annual Precipitation (MAP)

Based on the distance, years of data and reliability, The Cala (SAWS 0125331W) was the most suitable weather station to use. The Mean Annual Precipitation of 623 mm was used for the runoff calculations. The N.Cora, Lafuta, Zigudu and Lady Frere rainfall data were compared with the Cala rainfall data to support the selected station as can be tabled below :

SAWS NO	MAP	YEARS	RELIABILITY	DISTANCE (KM)	NAME
0125409AW	642	120	11%	26.300	N.CORA
0125409 W	642	2	33%	26.300	N.CORA
0125279 W	629	120	21%	27.800	LAFUTA
0102009 W	512	99	9%	29.900	ZIGUDU
0124402 W	567	120	91%	30.000	LADY FRERE

The SAWB Design rainfall tables are as follows :

SAWB NUMBER	Station Name	Latitude (°)'	Longitude (°)'	MAP (mm)	Altitude (m)	Years	Duration (days)	Return Period (years)																							
								2			5			10			20			50			100			200					
								L	D	U	L	D	U	L	D	U	L	D	U	L	D	U	L	D	U	L	D	U			
0125082 W	HOYANA (BOS)	31 52	27 33	754	1360	40	1	55	55	55	75	75	75	89	90	91	104	106	108	126	139	133	144	140	155	163	170	179			
0125150 W	COFIMVABA (TNK)	32 0	27 35	649	945	95	1	47	48	48	61	62	62	70	71	72	79	80	82	89	92	95	97	102	106	105	111	117			
0125278 W	HOTA	31 38	27 40	654	1130	45	1	61	62	62	84	84	85	100	101	102	117	119	121	141	145	149	163	167	174	183	191	201			
0125279 W	LAFUTA	31 39	27 40	629	1110	29	1	51	51	51	69	70	70	83	84	85	97	99	100	117	120	124	134	138	144	152	158	166			
0125331 W	CALA (TNK)	31 31	27 42	623	1170	44	1	37	38	38	50	50	50	58	59	59	66	67	68	76	78	80	83	86	89	91	95	99			
0125432 W	NOMADAMBA (BOS)	31 42	27 45	1071	1080	75	1	65	65	66	89	89	90	106	107	108	124	126	128	150	154	158	171	177	184	194	202	213			
0125454 W	MTINTHLONI (BOS)	31 34	27 46	1017	1240	64	1	65	65	64	86	86	87	103	104	105	120	122	124	145	149	153	166	171	178	188	196	206			

d) Drainage Density

The drainage density is the quotient of the length of a catchment and the catchment area. The 1:50 000 scale topographic maps were used to determine the drainage densities and these are summarised below :

Length (km)	Area (km ²)	Drainage density (km/km ²)
3.481	0.015	232

e) Design Flood Peaks

Flood peaks for various recurrence intervals were computed using the Modified Rational Method. The tables below list the computed flood peaks. The Modified Rational Method delivers accurate results for small catchments. The Modified Rational Method predicts peak run-off values from data on rainfall intensity and drainage basin characteristics. The method assumes that a rainstorm of uniform intensity covers the whole basin. Run-off will increase as water from more distant

parts of the catchment area reaches the outlet. When the whole drainage area is contributing, a steady state is reached, and discharge becomes a constant maximum. The time required to reach this steady state is called the “time of concentration”, and after this time, storm flow discharge is a fixed proportion of the rainfall intensity.

The length of the longest watercourse was measured taking into account all water retaining structures. ArcView 3.2 was used to measure catchment areas as well as the lengths of the longest watercourse. The net impacted areas were considered during the calculation. External catchment impacts were also assessed. The table below indicates the surface runoff volumes in the study area.

Recurrence interval	Area (m ²)	Area (km ²)	Longest water course (km)	Ave slope (m/m)	Tc (hrs)	Point rainfall (mm)	Point intensity (mm/h)	C - runoff factor	Peak Adj factor	Peak flow (m ³ /s)	Adjusted Peak flow (m ³ /s)	Flood vol Vr (m ³)
ELITHENI COAL MINE												
2	17000	0.017	3.481	0.083	0.452	38	84.002	1.000	0.830	0.397	0.329239	804
5	17000	0.017	3.481	0.083	0.452	50	110.528	1.000	0.830	0.522	0.433210	1058
10	17000	0.017	3.481	0.083	0.452	59	130.423	1.000	0.830	0.616	0.511188	1249
20	17000	0.017	3.481	0.083	0.452	67	148.108	1.000	0.830	0.699	0.580501	1418
50	17000	0.017	3.481	0.083	0.452	78	172.424	1.000	0.830	0.814	0.675807	1651
100	17000	0.017	3.481	0.083	0.452	86	190.109	1.000	0.830	0.898	0.745121	1820

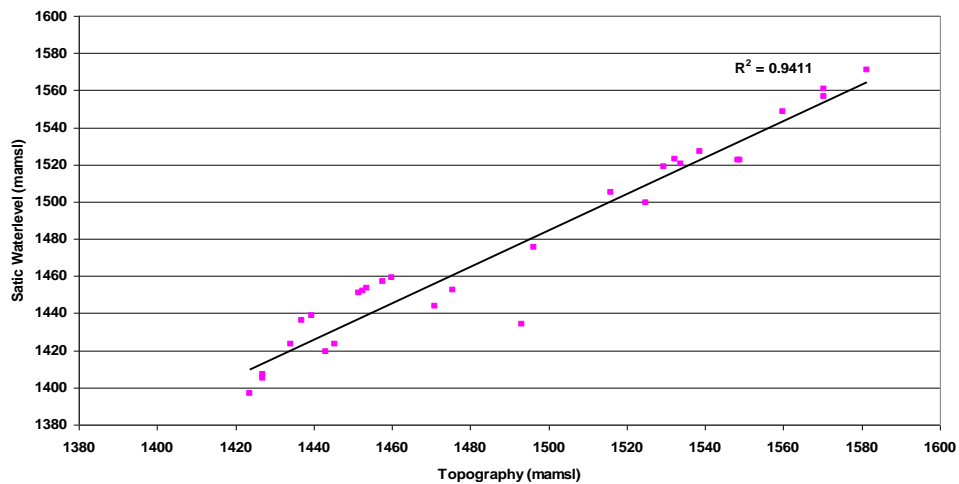
1.1.7 Groundwater

a) Depth to Groundwater

Based on data obtained from hydrogeological maps of the area, the depth to groundwater in the area ranges between 0,20 m to 75 m below ground level. Groundwater flow directions usually mimic topography. Over the study area, groundwater flow will follow the dolerite, sandstone and underlying coal and shale bedding planes, i.e. in a north eastern direction towards the Guba Valley and Nomaguwana River.

Borehole data show groundwater levels in the boreholes on and around the site ranging between 0,23 m and 60 m below ground level. The average depth to groundwater in the area is 15,29 m. Plotting groundwater level versus the topographical elevation at each observation point yields a 94% correlation as seen below.

Static Waterlevel vs Topography



This indicates that there is currently no external influence such as large-scale abstraction on the groundwater in the area.

b) Groundwater Potential

The groundwater potential of the mudstones, sandstone, and shale in their pristine state are negligible, with limited or low yields associated with bedding planes. Dolerite intrusions, due to contact metamorphism, enhance the groundwater potential. Fracturing and alteration occurs along the contact zones between the dolerite and the host rock. Alluvium material has good groundwater potential, due to higher permeability and transmissivity. The aquifers are, however, limited and are susceptible to surface contamination.

c) Groundwater Recharge

The groundwater is recharged by rainfall. Based on the hydrogeological maps the mean annual rainfall are 600 mm to 800 mm p.a. and average recharge to the groundwater is given as 50 mm to 75 mm p.a. This equates to 6% to 13% of the annual rainfall. Based on previous experience in similar geology and conditions, this is considered to be too high, and a value of not more than 3% of the annual rainfall 18 mm to 24 mm per annum is expected.

d) Groundwater Use

Groundwater in the area is being used for private domestic and small-scale agricultural supply. The local population obtain water for domestic use from the springs and river in the area as well as a municipal potable water reticulation system.

e) **Groundwater Quality**

The groundwater has a conductivity of 0-70mS/m as indicated by the hydrogeological maps of the area. Groundwater of the study area is predominately of a calcium-magnesium bicarbonate type with some sodium and chloride enrichment.

1.1.8 **Heritage Sites**

A Phase 1 heritage survey of the area has been undertaken by an archaeologist. No sites of significance were identified (Umlando, 2007).

1.1.9 **Paleontological Sites**

The Molteno Formation is recognised as one of the most productive fossil plant bearing units in the Karoo Basin. A comprehensive study of the Palaeoflora of the Molteno has been systematically done by John and Heidi Anderson, of the Botanica Research Institute in Pretoria, since 1967 and they have documented and researched the distinctive “Diroidium Palaeoflora” of the Triassic Period.

Conditions for the preservation of vertebrate remains during the deposition, and formation of the Molteno rocks was poor. As a consequence no vertebrate remains have been found in these sediments as can be concluded from the specialist report. Vertebrate trace fossils, in the form of dinosaur tracks, have been reported from isolated localities outside the mining permit area. Plant and insect fossils are well preserved in the Molteno sediments. Given the dolerite extrusion, it is doubtful that any plant fossils, and possible rare insect fossils, could be encountered during the mining activities in the mining permit area. The plant fossils would be best preserved in the finer shale beds found much lower elevations associated with the coal horizons and as thin shale layers interbedded in the coarser sandstone. Proximity dolerite intrusions, which are prevalent in the area, would have an adverse effect on the preservation of fossil plants.

1.1.10 **Social Environment**

The socio-economic baseline of the Eastern Cape Province indicates that poverty is widespread. In 1999, an estimated 67% of the population of the Province was below the poverty line and approximately 55% of the population of the Province was unemployed. Relative to the rest of the country, the Province is poor ; has higher levels of unemployment and more limited access to services. In 2001, the Province

was estimated to have approximately 15,5% of the total South African population, but a Gross Domestic Product (GDP) share of only 8,2%.

The Emalahleni Municipality has the fourth largest population (14% of the Chris Hani district) and extends over an area of approximately 3 840 km², includes more than 200 rural villages and comprises 16 wards. Recent statistics by the Municipal Demarcation Board (2005) and Global Insight (2005) estimates the population of the Emalahleni Municipality area to be ~116 000 people with 26 000 households. This translates to an average household size of 4,5 to 5 people. Growth trend analysis show that Emalahleni population grew negatively by ~7% over the past 10 years. The population density of Emalahleni is ~ 37 people per km². However, much of the population resides in the southern lower altitude sector of the area where the bulk of rural settlements occur. Living densities within these settlements range from between 5000 to 9000 people / km² (e.g. Tyoksville, Manyano, Mavuya and Sinakho) to less than 20 people / km² (e.g. Matyantya, Glen Adelaide, Maqashu, Zwartwater and Buffelsdoorns).

The economic characteristics of Emalahleni Local Municipality can be summarised as follows :

- The highest contributing sector to the Emalahleni Local Municipality GGP is the Community Service sector (72%), which is mainly financed by tax revenue and not, therefore, considered a sustainable growth-productive sector within the overall market.
- The second highest contributing sector towards the Chris Hani District Municipality's GGP is the Trade sector (13%), with the rest fairly insignificant.
- Within the Primary sector, Agriculture makes up only 12% and mining 0% of the GGP. The latter fact is indicative of the poor mineral resource endowment of the Municipality, while the former suggests the under-performance of the Agricultural sector.

The following potential for Agriculture has been identified in the Emalahleni Local Municipality :

- Cattle (beef) production in the central and south western areas
- Maize production north of the Xonxa Dam
- Sorghum production in the south east
- Sheep in most of Emalahleni

- Irrigation potential of a further 5 500 ha at the Xonxa and Lubisi Dams as well as irrigation at the Guba Farms

Local projects such as home gardens, small-scale irrigation, maize production, woodlots, bee-keeping, mushroom farming, freshwater fish production in the Doringriver Dam, and an Aloe Juice industry is also present.

The largest employment sector of the area is the Government / Social Service sector, which provides 38% of the formal employment. Second to this is the Private Household sector which employs 20% of the employed population with the Wholesale and Retail sector, providing some 15% of the employment in the district. The only other significant role-players, with regard to potential employment opportunity, are the Construction (8%) and Manufacturing (7%) sectors. It is important to note that the Agricultural sector contributes only 3% towards total formal employment in the area. Since much of the southern portion of the municipality constitutes communal settlement areas, agriculture is mostly of a subsistence nature.

1.2 Critical Environmental Features

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

There is no specific environmental features within the mining permit area that requires protection, remediation, management or avoidance. The rehabilitation plan, however, must be followed to ensure a safe environment upon mine closure.

1.3 Locality Map

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

See Annexure 2 : B002-007 A3 Local Plan indicating the Land Uses that indicates the land uses of the residential areas ; the mining area of the nearby colliery in relation to the proposed dolerite mining permit area as well as the remaining agriculture land ; all registered as Communal State Land.

1.4 Community Involvement

Provide confirmation that the description of the environment has been compiled with the participation of the community, the landowner and interested and affected parties.

The area was discussed at great lengths with all Interested and Affected parties (IAP's) and all IAP's agreed to the description of the existing physical environment as described in the "Mining Work Programme". ALL IAP's are in consensus : No comments were made on the existing status of the area also as described in the advertisement and notifications presented to the I&AP's. proof hereof is lodged electronically on the DMR's SAMRAD system.

2 REGULATION 52 (2) (b) : ASESSMENT OF THE POTENTIAL IMPACTS

Assessment of the potential impacts of the proposed prospecting or mining operation on the environment, socio- economic conditions and cultural heritage.

2.1 Description of the Proposed Mining Operation

2.1.1 Main Activities

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

The mining operation is proposed to be undertaken and completed within a 2-year period. Before any drilling & blasting activities can start, all topsoil will be removed and stockpiled to the south of the planned blasting area. The topsoil will be stockpiled no higher than 2m following the 1440 m.a.m.s.l. contour line.

a) Access Road

The mining permit is located in a remote area not accessible other than by foot. A nearby colliery, however, would be able to serve as entrance to the dolerite pit and a short access road (98m in length) needs to be constructed from gravel. This would be the only means of accessing the dolerite pit on top of the mountain, i.e. via the entrance of the nearby colliery's premises.

b) Topsoil Stripping

The topsoil is very thin ($\pm 10\text{cm}$) in the area, but the little bit that do exist needs to be stockpiled as indicated on the plan as described in Annexure 1 : . The topsoil will be stacked not higher than 2m and protected against erosion by planting of grass cover.

c) Drilling & Blasting

Explosives would be required to break the rock suitably to be loaded. A hydraulic tophammer crawler mounted drill rig would drill up to 15m deep holes (up to 102mm

in diameter each) to be loaded with explosives for blasting. This blasting would be conducted frequently about once per month to once per week.



Figure 5 : A similar hydraulic drill rig would drill holes to be loaded with explosives.

d) Loading & Hauling

The blasted rock is loaded by means of a hydraulic excavator onto articulated dump trucks to be hauled to off-site for further material processing. This activity should be conducted during daylight hours Monday to Saturday, but during extraordinary circumstances of high production rates and - market requirements the loading & hauling of blasted rock could be conducted from 06h00 to 24h00 Mondays to Saturdays.



Figure 6 : The loading of blasted dolerite rock by similar means of a hydraulic excavator onto an articulated dump truck.

e) Rehabilitation

After the pit had been mined out, big boulders would be equally spaced next to one another to prevent the accidental entry into the pit that could lead to falling below to a lower level.



Figure 7 : Placement of big boulders along the crests serve as protection and natural barriers.

2.1.2 General Mining Plan

Plan of the main activities with dimensions.

See Annexure 3 : B002-006 A3 Mining Plan for details describing the extent of the elevations of the dolerite pit. Six operating levels 10m vertically apart would be excavated ranging between levels 1435 ; 1425 ; 1415 ; 1405 ; 1395 & 1385 all indicating the floor elevation in m.a.m.s.l.

2.1.3 Project Plan by Phases

Description of construction, operational, and decommissioning phases.

a) Mine Development

Very little needs to happen for site establishment and the total mine development should be completed within 3 months of starting. The work entails :

- constructing a temporary mine haul road to the nearby colliery
- removing of topsoil and stacking it at the south of the mine
- Installing a perimeter fence and sign boards inclusive of the gates
- Placement of a security guard hut and a chemical toilet at the gate

b) Mine Production

The initial blast would need to break into the solid ground in order to establish a free face to optimise the production process. This initial burn cut would be done simultaneously with the blasting of the first decline access ramp from level 1440 - to 1435 m.a.m.s.l. Thereafter the entire quarry would be mined up to the quarry extent on this 1435 level by conducting 10 blasts. This would be followed by another decline access ramp from level 1435 - to 1425 m.a.m.s.l. and the process would repeat itself until the final lowest level would be 1385 m.a.m.s.l. By then the lowest floor would only be about 38m X 38m, which would be the minimum size to comfortably mine taking the turning circles constraint of the vehicles into account.

c) Mine Closure

Once the mine had reached its limits, then the rehabilitation process would start. Either an application for mine closure would be lodged, or should the market indicators prove to extend the financial viability of the mine, then the mining permit would be renewed, or an application for a mining right would be lodged with the DMR.

2.1.4 Listed Activities

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

This application affects only two listed activities in terms of the NEMA EIA regulations:

Activity No.	Activity Description	Identification of competent authority
8	Reconnaissance, prospecting, mining or retention operations as provided for in the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), in respect of such permissions, rights, permits and renewals thereof.	The competent authority for this part of the resources schedule is the Minister or an organ of State with delegated powers in terms of section 42(1) of the National Environmental Management Act, Act 107 of 1998, as amended.
9	In relation to permissions, rights, permits and renewals granted in terms 8 above, or any other similar right granted in terms of previous of mineral or mining legislation, the undertaking, of any prospecting or mining related activity or operation within a prospecting, retention or mining area, as defined in terms of section of 1 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	

2.2 Identification of Potential Impacts as per Guideline

2.2.1 Individual Impacts

Potential impacts per activity and listed activities

The majority of the impacts to the environment are localised and associated with the area of disturbance. The environmental impacts associated with the mining operation have been assessed according to the guidelines provided by the National Environmental Management Act, Act 107 of 1998. The following table lists the potential impacts applicable to each of the aforesaid main activities.

Description of Impact	Development	Production	Closure
Geology: Extraction of dolerite and sandstone	Applicable	Applicable	Applicable
Topography: Change in landforms	Applicable	Applicable	Applicable
Soils: Loss of soil fertility	Applicable	Applicable	Applicable
Increase in soil erosion	Applicable	Applicable	N/A
Land capability: Reduction in the agricultural potential of the area (cultivation).	Applicable	Applicable	N/A
Reduction in the agricultural potential of the area (grazing)	Applicable	Applicable	N/A
Land use: Constraint on future land use options as a consequence of mining operations	Applicable	Applicable	N/A
Flora: Loss of indigenous vegetation cover	Applicable	Applicable	Applicable
Loss of Red Data, protected or sensitive flora species	Applicable	Applicable	Applicable
Removal of alien species	Applicable	Applicable	Applicable
Fauna: Loss of habitat (grassland).	Applicable	Applicable	Applicable
Loss of Red Data, protected - or sensitive fauna species	Applicable	Applicable	Applicable
Surface water resources: Dewatering / Decanting of the aquifer	Applicable	Applicable	Applicable
Contamination of surface water through spillage of diesel or hydrocarbon chemicals.	Applicable	Applicable	Applicable
Contamination of surface water through waste / grey water	Applicable	Applicable	Applicable
Contamination of surface water as a result of inappropriate management of waste	Applicable	Applicable	Applicable
Groundwater resources: Potential increase in recharge to the lower aquifer due to excavations	Applicable	Applicable	Applicable
Potential contamination of groundwater from poor quality leachate	Applicable	Applicable	Applicable
Dewatering of the aquifers	Applicable	Applicable	Applicable
Contamination of the groundwater through waste / grey water	Applicable	Applicable	Applicable

Description of Impact	Development	Production	Closure
Hydrocarbon contamination during mining operations	Applicable	Applicable	N/A
Air quality: Increase in dust emissions	Applicable	Applicable	N/A
Increase in gaseous emissions	Applicable	Applicable	N/A
Noise: Increase in ambient noise levels in the surrounding areas	Applicable	Applicable	N/A
Archaeological, cultural and heritage sites: Loss of sites of archaeological, cultural or historical importance	Applicable	Applicable	Applicable
Socio-economic: Increase in employment / financial status of the local communities.	Applicable	Applicable	Applicable
Benefits to the local economy	Applicable	Applicable	Applicable
Hazards posed to the local inhabitants as a result of increased traffic	Applicable	Applicable	Applicable
Safety and security for local inhabitants	Applicable	Applicable	Applicable
Vibration impacts for local inhabitants	Applicable	Applicable	N/A

2.2.2 Cumulative Impacts

Potential Cumulative Impacts

The only residual and possible latent impact of the mine after closure will be the final highwall which could be visible when looking down upon the mountain. As the highwalls are situated on a plateau on the top of the mountain, the skyline in the area would not be affected. This highwall will not be visible from the DR08598 road, which carries minimal traffic as well.

The final void may be used to dam water as a reservoir for consumption by the lower lying communities ; or as a drinking water hole for animals.

2.2.3 Heritage Impacts

Potential impact on heritage resources

A Phase 1 heritage survey of the area has been undertaken by an archaeologist. No sites of significance were identified (Umlando, 2007).

2.2.4 Impacts on communities, individuals or competing land uses.

If no such impacts are identified in close proximity, then this must be specifically stated together with a clear explanation why this is not the case.

The impact due to mining is very limited upon the Guba Communities as the 1½ hectare mining permit area would impede upon the grazing potential of the local livestock farmers. However, compared to the vast grazing areas in the surrounding areas, this impact would be negligible small. The 1½ hectare mining permit area also is natural grasslands with very little economic value as opposed to cultivated land. Hence, the mining venture has negligible small impacts on communities, individuals and their competing land uses.

2.2.5 Impacts part of IAP process

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

The list of potential impacts has been compiled by the specialists and then presented to all Interested an Affected Parties (IAP's) to comment thereon. No comments were raised and all IAP's accepted it.

2.2.6 Confirmation of specialist report appended

(Refer to guideline)

All specialist reports are either included directly into this report, or loaded electronically onto the DMR's SAMRAD system to substantiate the findings herein.

3 REGULATION 52 (2) (c) : SUMMARY OF THE ASSESSMENT

Summary of the assessment of the significance of the potential impacts and the proposed mitigation measures to minimise adverse impacts.

3.1 Impact Assessment

Assessment of the significance of the potential impacts.

3.1.1 Assessment Criteria

Criteria of assigning significance to potential impacts

This process involves the assessment of nature, extent, duration, probability, intensity and significance of identified environmental, social and cultural impacts of the mining operation. The methodology applied is to rate the probability, extent, duration, intensity and thereby significance of each impact, according to the table below :

Category	Category	Rating	Description
Extent	Site only	1	Project site
	Local	2	Effects immediate surrounding areas
	Municipal	3	Effects municipal area
	Regional	4	Effects regional area
	National	5	Effects R.S.A.
Duration	Very short term	1	Less than 1 year
	Short term	2	1 to 5 years
	Medium term	3	5 to 20 years
	Long term	4	Longer than 20 years
	Permanent	5	Permanent
Probability / Likelihood	Improbable	0	Less than 30% chance
	Possible	1	30 to 50% chance
	Probable	2	50 to 75% chance
	Definite	3	Greater than 75% chance
Intensity	Very low	1	No effect on natural, cultural or social conditions
	Low	2	Marginal effect on natural, cultural or social conditions
	Moderate	3	Modification of natural, cultural or social conditions
	High	4	Temporary threat to existence of natural, cultural or social conditions
	Very high	5	Permanent Threat to existence of natural, cultural or social conditions
Significance	Very low	0 to 24	The Significance is a measurement of the product of the individual ratings of the Extent, Duration, Probability and Intensity.
	Low	25 to 47	
	Medium	48 to 94	
	High	95 to 188	
	Very high	189 to 375	

3.1.2 Impact Assessment

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

Each Impact is evaluated using the criteria listed above and mitigating management measures are assigned to each Impact in the table below :

Description of Impact	Nature	Extent	Duration	Probability/Likelihood	Intensity	Significance/irreplaceable loss of resource	Mitigation/ Management measures
Geology: Extraction of dolerite and sandstone	All dolerite and sandstone within the 1,5 ha opencast area will be removed during mining.	Local	Permanent	Definite	Very Low	High	Mitigation of this impact is not possible.
Topography: Change in landforms	Modification of the land surface will occur in the study area as a result of the destroying of the underground workings.	Local	Permanent	Definite	Low	Moderate to high - localised	Mitigation of this impact is not possible.
Soils: Loss of soil fertility	Due to the relatively thin topsoil layer within the study area, and the limited extent of the mining operations, no significant loss of soil fertility is expected to occur.	Local	Permanent	Likely	Moderate	Low	Any topsoil removed from the study area must be appropriately stockpiled for use in rehabilitation activities once the mining operations are complete.
Increase in soil erosion	A limited increase in soil erosion may occur in the immediate vicinity of the earthmoving operations due to a loss of vegetation cover and increased traffic in the area.	Local	Short-term	Probable	High	Moderate to high - localised	Loss of vegetation cover should be limited as far as possible. Steep slopes and exposed highwalls must be stabilised. Road surfaces must be stabilised and maintained.
Land capability: Reduction in the agricultural potential of the area (cultivation).	The area has very limited cultivation potential as a result of the shallow soils, elastic nature of the soil profiles and access to the land. No cultivation activities are currently being undertaken within the proposed study area and it is unlikely that the area would be used for cultivation upon mine closure.	Local	Permanent	Very unlikely	Very Low	Low to none	No action required.
Reduction in the agricultural potential of the area (grazing)	The mining operation will have a very limited impact on grazing potential of the land.	Local	Permanent	Unlikely	Moderate to high	Low	The mining area must be barricaded off and access restricted in order to ensure that both humans & animals are not injured through falling into any of the voids created during mining.

Description of Impact	Nature	Extent	Duration	Probability/Likelihood	Intensity	Significance/irreplaceable loss of resource	Mitigation/ Management measures
<p>Land use: Constraint on future land use options as a consequence of mining operations</p>	Land is currently used for grazing only. The proposed mining operations are not expected to constrain future land use options. The rehabilitation of this area could potentially have a positive impact as this area could be used as a water reservoir.	Local	Short-term	Unlikely	High	Low (positive)	The final water hole must be prepared by barricaded off all crests upon mine closure with one entrance via the ramp only.
<p>Flora: Loss of indigenous vegetation cover</p>	Vegetation cover will be lost within the mining area as the dolerite and sandstone needs to be removed.	Local	Permanent	Definite	High	Moderate	The affected area should be rehabilitated as soon as possible after the mining operations are complete.
Loss of Red Data, protected or sensitive flora species	No protected plants of conservation importance have been recorded on the proposed study area. However, in the surrounding areas succulent species (<i>Mesembryanthemaceae</i> & <i>Crassulaceae</i>) have been recorded on the rocky outcrops and ridge lines. The small potential for these species occurring is, in addition, minimal due to the area suffering past disturbance due to livestock grazing.	Local	Permanent	Unlikely	Low	Moderate to high	Search and rescue efforts must be undertaken within the mining area prior to the commencement of mining activities. Any red data or protected species must be collected and kept in a nursery for use in rehabilitation efforts within the perimeter fenced in area.
Removal of alien species	Disturbance of an area creates opportunities for colonisation by alien plant species (as these are generally pioneer species).	Local	Short-term	Probable	High	Low	The mining area must be monitored for the occurrence of alien plant species on a continuous basis and such species must be appropriately removed.
<p>Fauna: Loss of habitat (grassland).</p>	A very limited loss of grassland habitat will occur within the blasting area as this area is already disturbed as a result of previous livestock grazing in the area.	Local	Permanent	Definite	Low	Low	The blasting area should be rehabilitated as soon as possible after the earthmoving operations are complete within that area.

Description of Impact	Nature	Extent	Duration	Probability/Likelihood	Intensity	Significance/irreplaceable loss of resource	Mitigation/ Management measures
Loss of Red Data, protected - or sensitive fauna species	No fauna of conservation importance have been recorded on the proposed study area. Due to the limited extent of the mining area, Red Data, protected and sensitive fauna species are unlikely to be lost.	Local	Permanent	Unlikely	None	Low	No faunal species should be collected, hunted or killed on the site.
Surface water resources: Dewatering / Decanting of the aquifer	The transfer of water from the aquifer to surface (or vice versa) may impact negatively on the receiving water body.	Local	Long-term	Likely	Low	Low	It is not possible to mitigate this impact. The groundwater levels will recover to near pre-excavation levels once activities move away from an area and rehabilitation took place.
Contamination of surface water through spillage of diesel or hydrocarbon chemicals.	This impact is unlikely to occur as no chemical or fuel storage on site is envisaged. No decanting of diesel and hydrocarbons would be allowed.	Local	Short-term	Unlikely	High	High (as hydrocarbons directly effects the quality of the water)	Appropriate spill response kits and plans must be in place to react appropriately and timeously in the case of an accidental spill.
Contamination of surface water through waste / grey water	Wastewater generated on site has the potential to contaminate surface water.	Local	Short-term	Unlikely	High	Negligible	Any waste / grey water handling facilities on site must be managed appropriately to prevent spillage and prevent contamination of surface water.
Contamination of surface water as a result of inappropriate management of waste	Inappropriate management of waste on site has the potential to impact on surface water resources.	Local	Short-term	Unlikely	High	Negligible	Waste management principles should be implemented. Waste must be handled from when it is generated, be properly separated, stored, transported and disposed. Waste sorting areas must be demarcated and have a concrete floor. Waste bins must be labelled according to waste classes.

Description of Impact	Nature	Extent	Duration	Probability/Likelihood	Intensity	Significance/irreplaceable loss of resource	Mitigation/ Management measures
<p>Groundwater resources: Potential increase in recharge to the lower aquifer due to excavations</p>	<p>The upper aquifer material will be removed during the earthmoving operations. This will lead to a marginal increased recharge to the aquifer from direct rainfall into the areas and mounding of the groundwater level will be exacerbated in the mining area where this water is allowed to pond.</p>	<p>Local</p> <p>There are private groundwater users within the direct vicinity (1 km) of the area. This area is the potential zone of impact</p>	<p>Long-term</p>	<p>Highly probable</p>	<p>Low</p>	<p>Low</p> <p>Due to the fact that the massive sandstone strata and dolerite intrusions will be removed, the increase in recharge to the groundwater will be mild</p>	<p>This would assist the objective of rehabilitation to serve as a water hole for animals to drink from upon mine closure.</p>
<p>Potential contamination of groundwater from poor quality leachate</p>	<p>Depending on the chemistry of the minerals mined, the lower fractured rock aquifer below the quarry pit could be contaminated by oxidised minerals. Water quality will be influenced especially after rehabilitation.</p>	<p>Local</p>	<p>Long-term</p>	<p>Likely</p>	<p>Low</p>	<p>Low</p> <p>Dependent on the chemistry of the lithologies</p>	<p>It is not possible to mitigate this impact. The groundwater levels will recover to near pre-excavation levels once activities move away from an area and rehabilitation took place.</p>
<p>Dewatering of the aquifers</p>	<p>The upper aquifer is associated with the weathered material above the Molteno Sediments, and groundwater can seep from this aquifer into the quarry pit excavations causing localised dewatering of the aquifer.</p>	<p>Local</p> <p>Based on previous experience in similar lithologies and conditions, the zone of influence can be expected to extend ~1km from the mine.</p>	<p>Long-term</p>	<p>Likely</p>	<p>Low</p>	<p>Low</p> <p>Dependent on the groundwater levels in the area</p>	<p>It is not possible to mitigate this impact. The groundwater levels will recover to near pre-excavation levels once activities move away from an area and rehabilitation took place</p>

Description of Impact	Nature	Extent	Duration	Probability/ Likelihood	Intensity	Significance/ irreplaceable loss of resource	Mitigation/ Management measures
Contamination of the groundwater through waste / grey water	Wastewater generated on site has the potential to contaminate the underlying aquifers. Contamination would be localised.	Local	Short-term	Unlikely	High	Negligible	Any waste / grey water handling facilities on site must be managed appropriately to prevent spillage and prevent contamination of aquifers.
Hydrocarbon contamination during mining operations	Diesel and oil spillages might occur in the event of a burst hydraulic pipe / hose. Spillage of hydrocarbons in this environment will lead to contamination of the underlying aquifers. This impact is unlikely to occur as no chemical or fuel storage on site is envisaged.	Local	Short-term	Unlikely	High	High (as hydrocarbons directly effects the quality of the water)	Appropriate spill response kits and plans must be in place to react appropriately and timeously in the case of an accidental spill.
Air quality: Increase in dust emissions	An increase in dust emission is likely to result from blasting activities and from increased vehicular traffic.	Local	Short-term (i.e. for mining duration of ~2 months)	Definite	High	Moderate, depending on the location of sensitive receptors	Dust from gravel roads can be reduced through the use of appropriate dust suppression measures. Dust from blasting operations cannot be controlled.
Increase in gaseous emissions	Increased gaseous emissions may result at a local level from vehicles operating at the site and from those moving to and from the site.	Local	Short-term (i.e. for mining duration of ~2 months)	Likely	High	Moderate to Low, depending on the location of sensitive receptors	Vehicles must be maintained in a road worthy condition so as to limit the emissions to air.
Noise: Increase in ambient noise levels in the surrounding areas	The operation of equipment on the site and the movement of vehicles to and from the site will increase the noise levels in the surrounding areas.	Local	Short-term (i.e. for mining duration of ~2 months)	Definite	Low	Low	Equipment operating on site must be maintained in a workable condition in order to minimise noise emissions. Vehicles must be maintained in road worthy condition and must be fitted with silencers.

Description of Impact	Nature	Extent	Duration	Probability/ Likelihood	Intensity	Significance/ irreplaceable loss of resource	Mitigation/ Management measures
Archaeological, cultural and heritage sites: Loss of sites of archaeological, cultural or historical importance	A Phase 1 heritage study has confirmed that there are no sites located within the proposed study area. See Annexures Annexure 8 : Palaeontological Impact Assessment and Annexure 9 : Archaeological Impact Assessment.	None	None	None	Very Low	None	No action required.
Socio-economic: Increase in employment / financial status of the local communities.	Temporary employment of local inhabitants may occur, increasing their financial status and social upliftment in the process.	Local	Short-term (i.e. for mining duration of ~2 months)	Likely	N/A	Moderate (positive)	As far as possible, labour should be sourced locally.
Benefits to the local economy	The company ; its contractors and employees are likely to purchase goods and/or pay for services in the local area.	Local	Short-term (i.e. for mining duration of ~2 months)	Definite	N/A	Low (positive)	As far as possible, goods and services should be sourced locally.
Hazards posed to the local inhabitants as a result of increased traffic	The increase in heavy vehicle movement along the access roads through the local area could pose a safety hazard to the local community.	Local	Short-term (i.e. for mining duration of ~2 months)	Likely	High	High	The local community should be made aware of the increased heavy vehicle traffic and appropriate safety warning signs should be implemented.
Safety and security for local inhabitants	Upon mine closure the mine excavations could pose a safety hazard to local inhabitants and animals.	Local	Permanent	Definite	Very Low	High (positive)	Upon mine closure the mine's highwalls need to be barricaded off with large boulders to prevent access and falling to below with only one entrance at the ramp.
Vibration impacts for local inhabitants	Drilling and blasting operations, the operation of equipment on the site and the movement of vehicles to and from the site could induce vibration levels to the surrounding area.	Local	Short-term (i.e. for mining duration of ~2 months)	Definite	Low	Moderate, depending on the location of sensitive receptors	Blast vibration monitoring should be implemented.

3.1.3 Cumulative Impacts

Assessment of potential cumulative impacts

There are no other cumulative impacts other than the final void may be utilised either as a water reservoir supplying water at a constant pressure to the local lower lying communities ; or as a water hole for drinking purposes for animals to drink from..

3.2 **Mitigation Measures**

Propose mitigation measures to minimise adverse impacts.

See the table above in section 3.1.2.

3.2.1 Critical Activities

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

See the table above in section 3.1.2.

3.2.2 Technical or Management Options

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

See the table above in section 3.1.2.

3.2.3 Impacts after Mitigation

Review the significance of the identified impacts. (After bringing the proposed mitigation measures into consideration).

(a) Loss of Soils

Probability	Extent	Duration	Intensity	Significance	Mitigation measures
Definite 3	Local 2	Permanent 5	Very high 5	High 150	Temporary storage of topsoil for replacement after mining
Definite 3	Site 1	Long term 4	Medium 2	Very Low 24	Post mitigation

(b) Loss of Flora

Probability	Extent	Duration	Intensity	Significance	Mitigation measures
Definite 3	Local 2	Permanent 5	Very high 5	High 150	Replanting of endemic species after mining
Possible 3	Site 1	Long term 4	Medium 2	Very Low 24	Post mitigation

(c) Loss of Fauna

Probability	Extent	Duration	Intensity	Significance	Mitigation measures
Definite 3	Local 2	Permanent 5	Very high 5	High 150	Restoration of habitat after mining by replanting of endemic vegetation.
Definite 3	Site 1	Long term 4	Medium 2	Very Low 24	Post mitigation

(d) Surface Water Pollution

Probability	Extent	Duration	Intensity	Significance	Mitigation measures
Probable 2	Municipal 3	Long term 4	High 4	High 96	The installation of pollution control infrastructure such as stormwater channels and emergency spill kits against hydrocarbons
Possible 1	Local 2	Very short 1	Low 2	Very Low 4	Post mitigation

(e) Groundwater Pollution

Probability	Extent	Duration	Intensity	Significance	Mitigation measures
Probable 2	Municipal 3	Long term 4	High 4	High 96	The control of toxic substances and the availability of emergency spill kits against hydrocarbons
Possible 1	Local 2	Very short 1	Low 2	Very Low 4	Post mitigation

(f) Groundwater Draw-down

Probability	Extent	Duration	Intensity	Significance	Mitigation measures
Definite 3	Local 2	Permanent 5	Very high 5	High 150	Creation of dam or lake to force water into ground water upon mine closure
Probable 2	Local 1	Long term 4	High 4	Low 32	Post mitigation

(g) General Air Quality

Probability	Extent	Duration	Intensity	Significance	Mitigation measures
Definite 3	Local 2	Long term 4	Medium 3	Medium 72	Minimisation of dust generation and dust suppression by watering
Definite 3	Local 2	Short 2	Low 2	Very Low 24	Post mitigation

(h) General Noise Generation

Probability	Extent	Duration	Intensity	Significance	Mitigation measures
Definite 3	Local 2	Long term 4	Medium 3	Medium 72	High engineering standards of machinery to minimise noise
Definite 3	Site only 1	Long term 4	Low 1	Very Low 12	Post mitigation

(i) Visual Impacts

Probability	Extent	Duration	Intensity	Significance	Mitigation measures
Definite 3	Local 2	Permanent 5	High 4	High 120	Mining in such a manner as to create visually less disturbing skyline
Definite 3	Site only 1	Long term 4	Medium 2	Very Low 24	Post mitigation

(j) Highwall Slope Instability

Probability	Extent	Duration	Intensity	Significance	Mitigation measures
Definite 3	Local 2	Permanent 5	Very high 5	High 150	Design of mining layout and final slopes as per geotechnical study
Probable 2	Site 1	Long term 4	Very high 5	Low 40	Post mitigation

(k) Airblast, Shockwave and Ground Vibration

Probability	Extent	Duration	Intensity	Significance	Mitigation measures
Definite 3	Local 2	Long term 4	Very high 5	High 120	Design of blasting and machinery to reduce vibration and shock
Possible 1	Local 2	Long term 4	Low 1	Very Low 8	Post mitigation

(l) Waste Generation

Probability	Extent	Duration	Intensity	Significance	Mitigation measures
Definite 3	Local 2	Permanent 5	Very high 5	High 150	System process waste recycling, re-use and reduction measures. Separate storage of different categories of wastes
Definite 3	Site only 1	Permanent 4	Low 1	Very Low 12	Post mitigation

(m) General Socio-Economic Impacts

Probability	Extent	Duration	Intensity	Significance	Mitigation measures
Definite 3	Municipal 3	Long term 4	High 4	High 144	Job creation
Definite 3	Municipal 3	Long term 4	High 4	High 144	Support for other industries
Definite 3	Local 2	Long term 4	Medium 3	Medium 72	Installation of various interventions around environmental management
Definite 3	Local 2	Long term 4	Low 1	Very Low 24	Post mitigation

4 REGULATION 52 (2) (d) : FINANCIAL PROVISION

The Applicant is required to make financial provision.

4.1 Plans for Quantum Calculation Purposes

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

See Annexure 3 : B002-006 A3 Mining Plan for details showing the location and aerial extent of the aforesaid main mining actions and activities.

4.2 Alignment of Rehabilitation with the Closure Objectives

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

Two possible closure objectives exist as described in section 6.2 . The most expensive scenario is where the mine would need to be rehabilitated by re-spreading of the topsoil over the final slopes and then re-vegetated with indigenous grass species for future grazing of livestock.

Rehabilitation will need to be undertaken in sections, starting at the top elevation of the quarry retreating towards the bottom level thereof. This will ensure that an access road is maintained and that there is no need to move vehicles along rehabilitated areas. The phases of the rehabilitation should be undertaken as follows :

- a. The first task is to rip the current scarred mining areas. This would be achieved through rock-rubble blasting and then a thin layer of softer sandstone material. These layers should be a minimum of 0,3m deep.
- b. After placement, the loose material can be graded to the crests of the benches so as to ensure water retention for the growth of the seedlings. In addition, this would also minimise erosion. This can be done using the blade of a grader or by excavator.
- c. Once this material is spread, a front end loader could return the topsoil from the topsoil stockpile and spread it onto the placed material. Caution must be taken to spread topsoil evenly over the area. The front end loader could spread the soil so that the natural slope is reformed as far as possible.

- d. The topsoil could be fertilized to be in line with the natural soil state. The typical parameters are shown below :

Parameter	Typical value
Nitrogen in the form of LAN	300 kg/ha application rate
Organic carbon	10% to 25% by weight
Humus	5% to 10% by weight
Lime (Aglime)	0,5 ton/ha

- e. The nitrogen can be added as LAN fertilizer. The organic carbon and humus can be added by compost or wood chip amendment at a rate of 15 tonnes per hectare of road. The lime can be added by lime spreader.
- f. Once the soil amendments have been placed, the area should be tilled / scarified / rotavated using agricultural equipment.
- g. Wooden logs could then be laid down along the toe of each bench and pegged with wooden stakes. This wood would ultimately decompose whilst stabilising the toes of each embankment until such time the natural vegetation provides sufficient cover against erosion.
- h. The area should be seeded with typical grasses from that area, which typically include grasses such as *Eragrostis tef* (6kg) a hardy annual grass ; *Eragrostis curvula* (3kg) and *Chloris gayana* (3kg). The typical seeding rate should be in the order of 12kg/ha. and done with a cyclone hand seeder. Other species could also be introduced such as *Digitaria eriantha* (1kg) ; *Cynodon dactylon* (1kg) and *Paspalum notatum* (1kg) in addition to the abovementioned grass species. The grass could be hydro-seeded by spraying the area with water immediately after seeding.



Figure 8 : The *Eragrostis tef*, a hardy annual grass endemic to the area.

- i. Water should be applied at a rate of 120 000 lt/ha., which will be manageable using a standard water cart. Alternatively, a series of 5000 litre water tanks could be positioned along the crest of the highest bench and the water irrigation could be

done using gravity alone. Gentle irrigation of 25 mm per week should be applied until 60% grass cover has been reached. Avoid any livestock grazing during the re-vegetation periods.

- j. Cellulose pulp at 250 kg/ha and compost at 5m³/ha (100 X 50kg bags per ha.) should be added to the seed mix.
- k. The area must be monitored for 18 months after rehabilitation for the following items:
 - Depth of soil after placement
 - Soil erosion after rainfall events
 - Slippage of soil profile
 - Growth rate of grasses to see whether reseeding is necessary
 - Growth of natural vegetation over time.
 - Surface run-off water quality testing for the presence of any leached contaminants
- l. This will assist the slower establishing natural pioneer species to establish as well. The livestock farming would then be re-introduced to assist in the establishment of the grazing pastures.

4.3 Quantum Calculations

(Provide a calculation of the quantum of the financial provision required to manage and rehabilitate the environment, in accordance with the guideline prescribed in terms of regulation 54 (1) in respect of each of the phases referred to).

The guideline to determine the pecuniary value for rehabilitation is used to calculate the amount needed for rehabilitation. This is shown in summary in the table below :

Financial provision summary for rehabilitation at ELITHENI DOLERITE PIT

Item	Task	Rate	Units	Quantity	Multiplication Factor	Weighting Factors	Amount
1	Dismantling of processing plant and related structures, including overland conveyors & power lines.	R 6.82	m ³	0	1.000	1.050	R 0.00
2(A)	Demolition of steel buildings and structures	R 95.00	m ²	0	1.000	1.050	R 0.00
2(B)	Demolition of reinforced concrete buildings and structures	R 140.00	m ²	0	1.000	1.050	R 0.00
3	Rehabilitation of Access Roads	R 17.00	m ²	1250	1.000	1.050	R 22 312.50
4(A)	Demolition & rehabilitation of electrified railway lines	R 165.00	m ²	0	1.000	1.050	R 0.00
4(B)	Demolition & rehabilitation of non-electrified railway lines	R 90.00	m ²	0	1.000	1.050	R 0.00
5	Demolition of housing facilities	R 190.00	m ²	0	1.000	1.050	R 0.00
6	Opencast Rehabilitation including final voids & ramps	R 99 600.00	ha.	1.5	0.040	1.050	R 6 274.80
7	Sealing off of shafts, adits and inclines	R 51.00	m ³	0	1.000	1.050	R 0.00
8(A)	Rehabilitation of overburden & spoils	R 66 400.00	ha.	0	1.000	1.050	R 0.00
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	R 82 700.00	ha.	0	1.000	1.050	R 0.00
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	R 240 200.00	ha.	0	0.510	1.050	R 0.00
9	Rehabilitation of Subsided areas	R 55 600.00	ha.	0	1.000	1.050	R 0.00
10	General surface rehabilitation, including grassing of all denuded areas	R 52 600.00	ha.	0	1.000	1.050	R 0.00
11	River Diversions	R 52 600.00	ha.	0	1.000	1.050	R 0.00
12	Fencing	R 60.00	m	0	1.000	1.050	R 0.00
13	Water Management	R 20 000.00	ha.	0	0.170	1.050	R 0.00
14	2 to 3 Years of maintenance & aftercare	R 7 000.00	ha.	1.5	1.000	1.050	R 11 025.00
15(A)	Specialist Studies for closure	R 50 000.00	Sum	0	1.000	1.050	R 0.00
SUB-TOTAL 1 FOR MINE CLOSURE							R 39 612.30
a	Preliminary & General						R 4 753.48
b	Contingencies						R 3 961.23
SUB-TOTAL 1 FOR MINE CLOSURE							R 48 327.01
c	14 % Value Added Tax						R 6 765.78
TOTAL FINANCIAL PROVISION FOR REHABILITATION							R 55 092.79

4.4 Undertaking to provide financial provision

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

The applicant, Elitheni Coal (Pty) Ltd, currently have other financial guarantees in favour of the DMR in place for their other mining - and prospecting authorisations. The applicant has undertaken in their Financial & Technical Competence report loaded onto the DMR's SAMRAD system to adhere to the financial plan, which substantiates this amount and provision as part of the mine development costs. The applicant hereby acknowledges and confirms their undertaking to adhere to this EMP, including of the financial guarantee.

5 REGULATION 52 (2) (e) : PLANNED MONITORING

Planned monitoring and performance assessment of the environmental management plan.

5.1 Impacts to be Monitored

List of identified impacts requiring monitoring programmes.

The following impacts would require monitoring on a schedule basis :

(a) Dust fall-out monitoring

Four Dust buckets would be installed in the 4 directions away from the quarry pit as soon as this mining permit is granted. These buckets would be sampled on a quarterly basis and the dust measured would be analysed at an accredited laboratory. The results of the dust fall-out would be reported also quarterly and interpreted for management action.

(b) Noise

Ambient noise levels would be measured before the mining operation starts to establish the base level conditions prior to the mining venture. These tests would be repeated on a quarterly basis when the dust fall-out is measured. The results thereof would be reported also quarterly and interpreted for management action.

(c) Airblast & Ground Vibration

Airblast and ground vibration monitoring would be conducted each time when blasting with explosives is done. The seismograph would be installed at strategic locations to measure the airblast & vibration impacts due to blasting with

explosives. These results would be reported after each blast as part of the blasting report.

(d) Water Quality

Any water accumulations in the pit that would require pumping would be analysed on a quarterly basis. Samples would be taken and sent to an accredited laboratory for analysis. The results thereof would be reported also quarterly and interpreted for management action.

(e) EMP Performance Assessments

This EMP would be assessed for compliance after two years from date of issuing the mining permit. Should this mining permit be renewed, then it would be assessed for compliance on an annual basis thereafter. The EMP performance assessment would include assessment of the scheduled monitoring results.

5.2 Monitoring Requirements

Functional requirements for monitoring programmes.

Monitoring and performance assessment of the current Environmental Management Plan (EMP) will be undertaken in accordance with the process and procedure as stipulated in Regulation 55 of the Mineral and Petroleum Resources Development Act 28 of 2002.

Due to the nature of the mining activities, on-going monitoring of the adequacy of the EMP will be undertaken (specifically in terms of erosion control, surface and groundwater pollution prevention, dust control, safety and security, blasting operations). The success of the provisions of this amendment to the EMP will be reported on an annual basis.

A performance assessment of this amendment to the EMP will be conducted by a suitably qualified independent party upon mine closure after two years. This performance assessment will be available to the DMR and other regulatory authorities for their inspection, as required. Should the quarry life be extended and the permit renewed, then additional performance assessments will be undertaken every two years.

5.3 Roles & Responsibilities

Roles and responsibilities for the execution of monitoring programmes.

Regular monitoring of all the environmental management measures and components shall be carried out by Elitheni Dolerite in accordance with the requirements of Regulation 55 promulgated in terms of the MPRDA, Act 28 of 2002, in order to ensure that the provisions of this programme are adhered to. The purpose of the monitoring programmes would be to:

- Confirm the accuracy of the annual reporting
- Monitor on-going compliance with the EMP
- Monitor rehabilitation of the affected mining area

5.4 Monitoring Intervals

Committed time frames for monitoring and reporting.

The scheduled monitoring is conducted at the following intervals :

- | | |
|---------------------------------|--|
| (a) Dust fall-out monitoring | : Quarterly |
| (b) Noise | : Quarterly |
| (c) Airblast & Ground Vibration | : After each blast |
| (d) Water Quality | : When applicable - quarterly |
| (e) EMP Performance Assessments | : After two years, thereafter annually |

6 REGULATION 52 (2) (f) : CLOSURE OBJECTIVES

Closure and environmental objectives.

6.1 Rehabilitation plan

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

See Annexure 4 : B002-008 A3 Rehabilitation Plan indicating the Mine Closure Status for an impression of the rehabilitation of the quarry pit upon mine closure. Note that the second mine closure objective had been chosen where the embankments would be rehabilitated by means of rock-rubble blasting ; topsoil spreading and re-vegetation with grass species. The lowest level is however expected to become flooded for either mine closure objective. Should the first mine closure objective be chosen, then the

entire pit would become flooded with water, which would make the rehabilitation of the embankments unnecessary.

6.2 Closure Objectives

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

Mine closure will be undertaken in accordance with the process as outlined in Regulations 56 to 62 of the MPRDA, Act 28 of 2002.

Once the mining activities are complete, the area will be surrounded by the stacking of large boulders set 1 metre apart to form a natural barrier and a fence around the excavation. The proposed end use of the area is rural agriculture (as is currently the case). Two possible closure objectives exist :

- a) The final slopes get blasted gradually ; topsoil spread and re-vegetated with the indigenous grass species found around the site ; or
- b) The pit is allowed to dam up with water to form a reservoir to be utilised either as a drinking hole for animals, or for irrigation / potable water storage by the lower lying communities.

An environmental risk report shall accompany the application for closure. A closure plan will be compiled and accompany the application for closure. This closure plan will include :

- a description of the closure objectives and how these relate to the mining operation and its environmental and social setting;
- a plan contemplated in Regulation 2(2) showing the land or area under closure;
- a summary of the regulatory requirements and conditions for closure negotiated and documented in the environmental management plan;
- a summary of the results of the environmental risk report and details of identified residual and latent impacts;
- a summary of the results of rehabilitation undertaken;
- a description of the methods to decommission each mining component and the mitigation or management strategy proposed to avoid, minimise and manage residual or latent impacts;
- details of any long-term management and maintenance expected;
- details of financial provision for monitoring, maintenance and post closure management, if required;

- a plan or sketch at an appropriate scale describing the final land use proposal and arrangements for the site;
- a record of interested and affected persons consulted; and
- technical appendices, if any.

6.3 Confirmation of Consultation

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

See Annexure 5 : IAPs Consultation Dolerite Pit Final Report, for the report that had been lodged electronically onto the DMR's SAMRAD system. This report describes the engagement of all interested and affected parties, the minutes held and the feedback from them. As a summary : all anticipated impacts had been discussed with IAP's ;, the benefits of the project ; as well as the proposed rehabilitation plans and closure objectives. The proposals had all been approved by the IAP's and support for the project plan had been received.

7 REGULATION 52 (2) (g) : PUBLIC PARTICIPATION RECORDS

Record of the public participation and the results thereof.

7.1 Identification of interested and affected parties

Provide the information referred to in the guideline : Name the community or communities identified, or explain why no such community was identified. Specifically state whether or not the Community is also the landowner. State whether or not the Department of Land Affairs been identified as an interested and affected party. State specifically whether or not a land claim is involved. Name the Traditional Authority identified. List the landowners identified by the applicant. (Traditional and Title Deed owners) List the lawful occupiers of the land concerned. Explain whether or not other persons' (including on adjacent and non-adjacent properties) socio-economic conditions will be directly affected by the proposed prospecting or mining operation and if not, explain why not. Name the Local Municipality. Name the relevant Government Departments, agencies and institutions responsible for the various aspects of the environment and for infrastructure which may be affected by the proposed project. Submit evidence that the landowner or lawful occupier of the land in question, and any other interested and affected parties including all those listed above, were notified.

See Annexure 5 : IAPs Consultation Dolerite Pit Final Report, (specifically section 2 of such document) for the report that had been lodged electronically onto the DMR's SAMRAD system. All of the requirements listed above as per the guideline had been addressed in this report.

7.2 Engagement Process

The details of the engagement process.

7.2.1 Information Provided

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

See Annexure 5 : IAPs Consultation Dolerite Pit Final Report, (specifically sections 4, 5 & 6 of such document) for the report that had been lodged electronically onto the DMR's SAMRAD system. All of the requirements listed above as per the guideline had been addressed in this report.

7.2.2 List of IAP's Consulted

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

See Annexure 5 : IAPs Consultation Dolerite Pit Final Report, (specifically section 6.2 of such document) for the report that had been lodged electronically onto the DMR's SAMRAD system. All of the requirements listed above as per the guideline had been addressed in this report.

7.2.3 Base Level Environment as viewed by IAP's

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

See Annexure 5 : IAPs Consultation Dolerite Pit Final Report, (specifically section 3 of such document) for the report that had been lodged electronically onto the DMR's SAMRAD system. All of the requirements listed above as per the guideline had been addressed in this report.

7.2.4 Impacts as viewed by IAP's

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

See Annexure 5 : IAPs Consultation Dolerite Pit Final Report, (specifically section 4 of such document) for the report that had been lodged electronically onto the DMR's SAMRAD system. All of the requirements listed above as per the guideline had been addressed in this report.

7.2.5 Other Concerns

Other concerns raised by the aforesaid parties.

See Annexure 5 : IAPs Consultation Dolerite Pit Final Report, (specifically section 6.4 of such document) for the report that had been lodged electronically onto the DMR's SAMRAD system. All of the requirements listed above as per the guideline had been addressed in this report.

7.2.6 Appended Minutes & Records

Confirmation that minutes and records of the consultations are appended.

All minutes of meetings held with IAP's had been lodged electronically onto the DMR's SAMRAD System. The communication channels remain open between the applicant, Elitheni Coal (Pty) Ltd, and the IAP's and regular feedback sessions are being held. Therefore, not all minutes have been lodged as this project forms part of a greater economic development project.

7.2.7 Objections Received

Information regarding objections received.

Two Trusts claimed to be the representatives of the Guba-Machubeni Communities, i.e. the **Emalahleni Community Trust**, a trust duly registered with the beneficiaries being the communities of the Guba-Machubeni area ; and secondly the **Guba-Machubeni Development Trust**, a trust of unknown status and beneficiaries. In July 2010, the Public Protector found the latter trust, the Guba Trust, **NOT** to be the spokespersons on behalf of the communities of the Guba-Machubeni area for reasons as attached in Annexure 6 : Findings of Public Protector re. Guba Trust & Elitheni.

The Guba-Machubeni Development Trust has a total disregard for the authority of the Local Traditional Council and its leader, Chief Vulindlela, and for obvious reasons do not recognise the Emalahleni Community Trust. Elitheni Dolerite recognise the Guba-Machubeni Development Trust as an SMME operating in the Emalahleni Area and advised them to participate with the Emalahleni Business Forum – an IAP that also is in support of the Elitheni projects. Copies of the last meeting held with the Guba-Machubeni Development Trust (indicating their support to the Elitheni Dolerite project) and then the subsequent turnaround not approving the project are attached in Annexure 7 : Minutes of Meeting held with Guba Trust and their Response. Their objection is mainly because the trust wants equity in the Elitheni Dolerite business. For obvious reasons this wish of the Guba-Machubeni Development Trust cannot be entertained and constitutes not to be a valid objection, because socio-economic development would benefit the communities of the Guba-Hoek area.

The Guba-Machubeni Development Trust had failed to provide any of the requests made to submit proof of the validity of the Trust ; and is therefore regarded as a mere SMME operating in the area and **NOT** the spokesperson on behalf of the Guba-Machubeni Communities.

7.3 Issues Addressed

The manner in which the issues raised were addressed.

All issues raised were addressed by public meeting ; duly advertised and convened ; minutes thereof circulated to all IAP's and lodged with the DMR. Site visits were held for further clarity to IAP's.



Figure 9 : The meeting held (left) and site visit (right) with an SMME of the Guba-Hoek Area – the Guba Trust.

The channels of communication remains open and the latest minutes are attached in Annexure 7 : Minutes of Meeting held with Guba Trust and their Response.

8 SECTION 39 (3) (c) : ENVIRONMENTAL AWARENESS PLAN

Although Section 39 (7) of the Act states that the provisions of subsection (3) (c) of Section 39 – the requirements of an Environmental Awareness Plan – do not apply to the applications for a mining permit, Elitheni Dolerite still remains committed to conduct the following :

8.1 Employee communication process

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

This awareness plan is driven by the mine management and will cascade this awareness plan down to lower levels in the organisation. As the mine makes use of contractors to conduct the mining activities, this awareness plan forms part of the tender & contract documents that the contractor has to abide by. The appointed Mine Manger is the responsible person to ensure that this awareness plan is conveyed to each person entering the mine.

One of the most important overall techniques of conveying the greater message of environmental awareness is the “multiplier-effect” in which people who are taught then transmit what they learn to others. This means that messages are spread further and faster. For example : educating labourers helps to get information to their friends and family and others in the surrounding community. Similarly, this environmental awareness programme is aimed at any person entering the mine and should help to spread the messages to the local community. This is doubly useful, because it is important to provide local people with the skills and information needed to contribute fully to the greater area’s conservation plans.

The World Conservation Union (IUCN) has developed Red Data Book categories based on the need for conservation of species of special concern. The categories are described as follows :

- **Threatened** species are critically endangered, endangered, vulnerable or data deficient.
- **Critically endangered** species are when the best available evidence is that it is considered to be facing an extremely high risk of extinction in the wild.
- **Endangered** species are when the best available evidence is that it is considered to be facing a very high risk of extinction in the wild.
- **Vulnerable** species are when the best available evidence is that it is considered to be facing a high risk of extinction in the wild.
- **Near threatened** species are when it is close to qualifying for or is likely to qualify for a threatened category in the near future. **Rare** species have small world populations, but are not at present **Threatened**. They are at risk, because some unexpected threat could easily cause a critical decline.
- **Data deficient (uncertain)** species possibly fall in one of the above categories, but this is uncertain because of lack of information. Data Deficient is therefore not a category of threat but threatened status may well be justified.

Protected species are species recognised by law as worthy of conservation. These include the Red Data list species (all species listed above), but also species considered to be worthy of protection because of economic, aesthetic or historical value. These species also contribute to the conservation value of the ecosystem.

Through the development of a proper induction programme, the Mine Manager would convey the message of environmental awareness to all people entering the mine. See also section 8.3 for further details.

8.2 Description of solutions to risks

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

Information regarding environmental awareness needs to be presented in various formats to maximise the impact of the message. Useful materials include :

- toolbox talks
- induction sessions
- brochures
- posters & maps , and
- interactive displays.

In order to make the person conversant with the contents of this environmental awareness plan, the language of the media need to be produced in Afrikaans, English and Xhosa. The materials can be used in many different ways, with the eventual decision depending on the audience and the message that need to be conveyed, together with factors such as cost, time and practicality.

All forms of lubricants, oil, grease and fuel are examples of hydrocarbons. Once these elements are spilt or spread onto the ground, they contaminate the water resources through diffusion. For example one litre of diesel will contaminate 1000 kilolitres of water so that its trace elements would become measurable. The hydrocarbons poison the water quality and alter the pH in many cases. This will lead to numerous negative impacts upon vegetation, habitats and the quality of water resources. Even users of these contaminated water resources some kilometres downstream of the point of spillage could become affected. No Hydrocarbons may be stored on-site.

No solid waste, such as rubber and general refuse, may be burnt or buried in the mine. All solid waste must be placed in drums strategically placed by the person appointed by the Mine Manager. These drums must either have lids or be prevented from being filled more than half-way to prevent the refuse from blown away by winds. This refuse must be removed from site at least once a week, or more frequently when needed, and disposed thereof at a registered dumping site for general refuse.

No articles containing hazardous waste, such as oil filters, batteries or containers that housed paint, may be disposed of in these drums. They must be removed off-site before the end of the shift and disposed of at a registered hazardous waste disposal dump.

As no full-time employees are stationed at the mine premises, the need for permanent ablution facilities is not required. In the event of contractors coming on-site to perform mining duties, the appointed person by the Mine Manager shall provide and maintain sufficient and suitable latrine facilities of a high hygienic standard. These chemical toilets must be emptied ; serviced and cleaned on a regular basis. According to the regulations of the MH&SA it is therefore illegal for any person to pollute the workings with faeces or urine, nor wantonly misuse or foul any latrine.



Figure 10: Examples of portable chemical toilets.

Indwe is renowned for its consistent winds and strong winds. The mining activities would pollute the air with harmful exhaust gasses and dust liberated from the mining production vehicles. The liberation of dust could be windblown to neighbouring areas impacting upon the vegetation and its habitat. The exhaust gasses are negligibly small in concentration and poses no risk to the environment. However, people should not stand close to mining equipment (especially in confined areas) as the concentration could then become harmful. All people required to approach any vehicle, or work in the vicinity of vehicles, are required to wear type FFP-2 dust masks. The person appointed by the Mine Manager must apply dust suppression methods at the roadways to combat the liberation of dust whilst the mining activities are in process. Alternatively the mining production must temporarily cease during windy conditions.



Figure 11: Type FFP-2 dust mask.

8.3 Environmental awareness training

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

The main objective is to help promote a better understanding of natural features, ecology, resources, human interactions, culture and history of the area. Visitors and employees will have a more rewarding time at the mine if they are given access to interesting information regarding their environment. Another important objective of the awareness plan is to ensure that all those who enter the mine are aware of the regulations and the reasons why these regulations are necessary. People are more likely to comply with regulations if an effort has been made to explain these beforehand and the reason(s) why they have been introduced.

All visitors, contractors and full-time employees would be required to undergo this Environmental Awareness Training as part of their induction course when entering the mine for the first time. Follow-up training would to all employees would be rendered upon returning from their annual leave cycle as part of their induction and refresher courses.

All accidental spillages of hydrocarbons (such as a burst hydraulic hose for example) must be treated with an emergency oil spill kit provided by the mine manager. The contaminated soil must be scraped together ; removed from site and disposed of at a registered hazardous waste disposal dump. All employees and contractors would have to be able to apply the emergency spill kit to combat hydrocarbon pollution.

9 SECTION 39 (4) (a) (iii) : REHABILITATION CAPACITY

Capacity to rehabilitate and manage negative impacts on the environment.

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

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

Apart from the R55 000 financial guarantee to be issued in favour of the DMR and provided for rehabilitation of grounds, Elitheni Dolerite has planned an additional R350000,00 for rehabilitation and environmental management. These amounts have

been detailed in the mining permit application's Financial & Technical Competence document and lodged electronically via the DMR's SAMRAD system.

9.2 Confirmation of Financial Provision.

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

The environment affected by the mining operations shall be rehabilitated by Elitheni Coal (Pty) Ltd, as far as is practicable, to its natural state or to a predetermined and agreed standard or land use which conforms with the concept of sustainable development. Financial provision of R350 000.00 has been made by Elitheni Coal (Pty) Ltd for rehabilitation of this mining permit area and a further financial guarantee to be issued in favour of the DMR to the amount of R55 000 has been planned for. This financial provision will be made in the form of a bank guarantee upon acceptance of this EMP and instruction from the DMR.

10 REGULATION 52 (2) (h) : UNDERTAKING TO ADHERE TO EMP

The report must, at the end of the EMP include a certificate of identification as follows :

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

Full Names & Surname	Mr David John Nel
Identity Number	720524 5108 08 7

10.1 Annexure 1 : Letter from the Land Surveyor confirming State Land

Lodged electronically via the SAMRAD System

10.2 Annexure 2 : B002-007 A3 Local Plan indicating the Land Uses

Lodged electronically via the SAMRAD System

10.3 Annexure 3 : B002-006 A3 Mining Plan indicating the Mining Benches

Lodged electronically via the SAMRAD System

10.4 Annexure 4 : B002-008 A3 Rehabilitation Plan indicating the Mine Closure Status

Lodged electronically via the SAMRAD System

10.5 Annexure 5 : IAPs Consultation Dolerite Pit Final Report

Lodged electronically via the SAMRAD System

10.6 Annexure 6 : Findings of Public Protector re. Guba Trust & Elitheni

Lodged electronically via the SAMRAD System

10.7 Annexure 7 : Minutes of Meeting held with Guba Trust and their Response

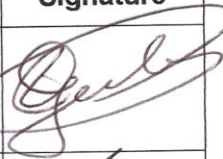

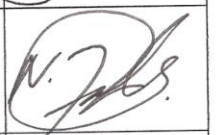
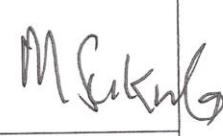
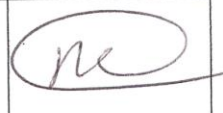
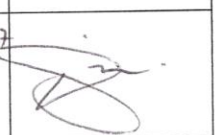
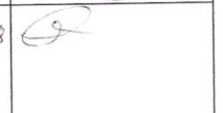

ALGOA CONSULTING MINING ENGINEERS cc



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Ref. nr. : ELITHENI DOLERITE - EC30/5/1/3/2/10010MP

**MINUTES OF THE MEETING HELD ON THE 28TH OF
 SEPTEMBER 2011 AT 11H00 WITH THE GUBA-
 MACHUBENI DEVELOPMENT TRUST AS PART OF THE
 CONSULTATION PROCESS WITH INTERESTED AND
 AFFECTED PARTIES**

No.	Capacity	Name, Surname	Tel. Nr.	Signature
1.	Algoa Consulting Mining Engineers	Mr Rudi Gerber	041 367 5501 082 653 2568	
	e-mail : rudi@algoacme.co.za			
2.	Algoa Consulting Mining Engineers	Mr Johann Gerber	041 367 5501	
	e-mail :			
3.	Elitheni Coal (Pty) Ltd	Mr Ntobeko Faleni	045 952 1287 072 034 0144	
	e-mail : ntobeko.faleni@elitheni.co.za			
4.	Department of Rural Development and Land Reform	Mr Monde Sukula	045 839 2296 082 577 5614	
	e-mail : lmsukula@ruraldevelopment.gov.za			
5.	Guba-Machubeni Development Trust	Mr D.M. Makatesi	072 533 1502 084 641 1070	
	e-mail :			
6.	Guba-Machubeni Development Trust	MR. SAM KIRI TRUST SECRETARY	072 671 9697	
	e-mail : Sam.kiri@yahoo.com			
7.	Guba-Machubeni Development Trust	NOSIPHAWO GONO member.	072 916 9468	
	e-mail :			
8.	Guba-Machubeni Development Trust	MANGELIKI MPINKA member	0785507325	
	e-mail :			
9.				
	e-mail :			

Annexure 7 (Continues)
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1. WELCOME

Mr Rudi Gerber, welcomed everyone to the meeting whilst Mr Ntobeko Faleni from Elitheni Coal translated everything between English and isiXhosa. Everybody introduced himself/herself and the role he/she would play during the meeting.

2. INTRODUCTION

Mr Rudi Gerber explained the agenda and the procedures of the meeting as to how it would be conducted. Everyone understood when they would be afforded an opportunity to make a contribution towards the meeting.

3. BACKGROUND

Mr Rudi Gerber explained the events leading up to this meeting as follows :

- a) Elitheni Dolerite, a small mining venture of Elitheni Coal (Pty) Ltd, lodged an application on the 26th of August 2011, to mine dolerite and sandstone as aggregates and road layering material specifically for the upgrade of the gravel roads of the Machubeni area on a 1½ hectare mining permit area, just outside and north-west of the existing shaft mining area of Elitheni Colliery.
- b) Part of this application process is the engagement of all Interested & Affected Parties (IAP's) and Elitheni Coal advertised in various formats to invite IAP's to register to engage in consultation. Example of the notifications & advertisement and the "Reply Form" is attached in ANNEXURE A to these minutes.
- c) Mr DM Makatesi registered as IAP on behalf of the Guba-Machubeni Development Trust by means of fax letter dated the 19th of September 2011.
- d) An initial meeting was held on the 20th of September 2011 between Mr R Gerber, Mr N Faleni ; Mr DM Makatesi ; Ms N Gono and another community member of the Guba-Hoek village and the initial responses were noted on the "Reply Form".
- e) Mr Rudi Gerber also gave Mr DM Makatesi a copy of the Mining Work Programme of the dolerite mining venture indicating the intended mining activities on the small mining permit area.
- f) It was agreed at the meeting to hold a follow-up meeting with the Guba-Machubeni Development Trust to obtain a quorum from the trustees as the initial meeting was convened on short notice. The date was set for the 28th of September 2011 at 11h00 at the same venue at Guba-Hoek.

Annexure 7 (Continues)
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4. PROJECT DESCRIPTION

Mr Rudi Gerber described the project in detail how it relates to the existing works of Elitheni Coal (Pty) Ltd. He described the area to be impacted upon by showing various mine layout plans and referring to documentation submitted to the Department of Mineral Resources (DMR) with the application thereof. He gave a brief description of the application process and the various roles of each IAP being : Elitheni Coal (Pty) Ltd (the APPLICANT) ; the DMR (the AUTHORITY) who administers the Act and mining authorisations ; the Department of Rural Development and Land Reform (the LAND OWNER) ; the Communities of Machubeni (the LAWFUL LAND OCCUPIER) ; the local Business Sector within the area. He described possible impacts to be considered as well as possible rehabilitation plans upon mine closure.

Mr. Rudi Gerber indicated that the permit to mine dolerite and sandstone is only valid for a maximum of 5 years. The area where this mining would take place is separate from the coal mine operation and independent. Blasting, drilling and excavation will take place at the dolerite mining site. No workshops will be erected at this work area and no contamination of soil or water due to oil or diesel is foreseen. Airborne dust should not affect the local community as it is far away from any residential dwellings. Water could be used to render dust suppression should it become a problem.

Once this dolerite mining has been completed, the area may be used to supply more rock as a commercial quarry, or it may be used as a natural dam area for the livestock in the area to drink from, or as a reservoir for potable water to the village below.

5. MATTERS FROM IAP

a) Employment

Mr Deon Makatesi stated at the initial meeting that when the mine starts, the members of the Guba-Machubeni Communities should get preference when employment of unskilled- & semi-skilled labour is recruited.

Mr Rudi Gerber replied that it is well documented and exactly the plan of Elitheni Coal to do that. Initiatives had been put into place to ensure that labour would be sourced firstly from within the Guba-Machubeni Communities, secondly from the greater Emalaheni Municipal Area ; and only lastly from elsewhere. Mr Rudi Gerber further urged the community to prepare themselves by ensuring that prospective job-seekers

Annexure 7 (Continues)
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should have the necessary documentation ready when called upon, i.e. ID Document; any certificates of competency; physical addresses and postal addresses.

b) Community Development

Mr. Kibi express his gratitude for the process of consultation used for this mining permit. Mr Deon Makatesi stated that the Guba-Machubeni Development Trust would want to be part of the decision making process for the development of the Guba-Machubeni Communities. Messrs Kibi and Makatesi indicated that they will inform the three local villages in the Guba Hoek area.

Mr Rudi Gerber stated that it is clear that the agricultural community upliftment initiatives undertaken by Mr DM Makatesi and the Guba-Machubeni Development Trust needs to be commended. That in itself, is proof that the Guba-Machubeni Development Trust contributes to the economic development of the Guba-Hoek Communities already and need continue to do so. Everybody can see that the Guba-Machubeni Development Trust is an SMME that leads by example in the Guba-Hoek area. Elitheni Coal further undertook to continue to give regular feedback to all IAP's regarding the progress of its operations.

c) SMME Opportunities

Mr Deon Makatesi requested at the earlier meeting that when the dolerite mine starts, that Elitheni Coal would give preference to SMME's of the Guba-Machubeni area before searching for suppliers of goods and services elsewhere.

Mr Rudi Gerber stated that Elitheni Coal supports the Mining Charter of South Africa and in particular the preferential procurement policies thereof. Only once SMME's from the Guba-Machubeni area cannot meet the requirements of the desired goods & services, then the greater Emalahleni Municipal area would be searched ; and only thereafter elsewhere.

d) Road forward

Mr Monde Sukula asked what would be the road forward from here onwards as this project could benefit the Guba area for only 5 years. What would happen thereafter?

Mr. Rudi Gerber stated again that the permit to mine dolerite and sandstone is only valid for a maximum of 5 years. However, after the 5 year period and hopefully as the market grows, the potential exists that this dolerite mine could be expanded into a commercial quarry that could supply aggregates for concrete to the greater

Annexure 7 (Continues)
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Emalahleni area as the Integrated Development Plan of the Emalahleni Municipality indicates more municipal roads in need of upgrade.

Mr Sam Kibi then stated the positive attitude of the Guba Communities and the people would support the project to start and grow into something big. Mr Sam Kibi suggested first to obtain a community resolution though.

e) Social & Labour Plan

Mr Sam Kibi asked how would this project contribute towards the Social & Labour Plan of Elitheni Coal.

Mr Rudi Gerber stated that as this dolerite mining permit does not need a Social & Labour Plan, the Elitheni Dolerite mining venture is not obliged to contribute towards the existing Social & Labour Plan of the adjacent Elitheni Colliery. However, as both mining ventures would be owned by Elitheni Coal (Pty) Ltd, this mining venture would contribute towards the Social & Labour Plan.

f) Equity in Elitheni Coal (Pty) Ltd

Mr Wilfred Matiwane wanted to know why Elitheni Coal gave 3% equity to the Municipality if Elitheni was not obliged to do so.

Mr Rudi Gerber replied that the reason for Elitheni Coal doing that is unbeknown to him ; not part of this dolerite application ; and can only speculate that it was a sign of good faith from Elitheni's side.

g) Land Rental Agreement

Messrs Kibi and Matiwane wanted to know if there is a land rental agreement between Elitheni Coal and the DRDLR for the hiring of the affected land.

Mr Sukula replied that these talks are on a higher level between the DRDLR and Elitheni and the outcome thereof is not known yet.

h) Traditional Leadership

Mr. S.P. Sokoyi stated that the members of the communities of Guba-Hoek do not recognise chief Vulindlela as their chief and traditional leader but is a mere "puppet" of Elitheni. Mr Mongerieric Mpinka supported this notion and suggested Elitheni should refrain from talking to chief Vulindlela as they (the Guba-Hoek Communities) do not recognise him as their chief. Mr Sam Kibi said that the Guba-Machubeni

Annexure 7 (Continues)

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Development Trust in fact represents the 35 villages of the Guba-Machubeni area instead of Chief Vulindlela.

Mr Rudi Gerber replied that Chief Vulindlela was indicated by the House of Traditional Leaders as the person in charge of the Guba area, which forms part of the Machubeni area. Mr Sukula acknowledged this ; that this must have been and is the proper way the tribal leader, chief Vulindlela, was introduced to Elitheni.

i) Employment as Benefit

Mr. S.P. Sokoyi stated that employment opportunities cannot be seen as a benefit towards the community, because the person paid with his hard labour and did not get any benefit. He also asked what benefit would the other community members have – those that do not get employed by the mine – if only some community members are afforded employment.

Mr Rudi Gerber replied that employment is generally regarded as a benefit to any community as it improves the household income of the employees and uplifts the community from poverty and crime. Mr Sukula added that the term "benefit" is sometimes misinterpreted as a "free present" whereas the opportunity (itself) to work is the benefit.

j) Elitheni Community Trust

Mr Mongerieric Mpinka stated that the Elitheni Community Trust does not represent the Guba-Machubeni Communities and it comprises a few individuals mainly being Municipal Officials.

Mr Rudi Gerber replied that the Elitheni Community Trust also registered as an IAP to this dolerite mining project and Elitheni afforded them also the same presentations. The Elitheni Community Trust is a trust duly registered in terms of the Trust Property Control Act, Act 57 of 1988, specifically for the advancement of community development of the Machubeni Area, being the beneficiaries of the trust. The Officials he refer to are not beneficiaries, but only trustees of the trust. The Elitheni Community Trust is funded by Elitheni Coal (Pty) Ltd.

k) Emalahleni Business Forum

Mr Mongerieric Mpinka stated that the Emalahleni Business Forum is not an interested and affected party to this development as they do not have any interest in the Guba

Annexure 7 (Continues)

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area. He suggested that they should come to the Guba area and form part of the initiatives led by the Guba-Machubeni Development Trust.

Mr Rudi Gerber replied that the Emalahleni Business Forum also registered as an IAP to this dolerite mining project and Elitheni afforded them also the same presentations. He also stated that the dolerite project proposed by Elitheni have a far greater impact than only the immediate Guba-Hoek area and he furthermore suggested to Mr Mpinka to engage in talks and to participate in the greater Emalahleni Business Forum through leading by example using their own agriculture project.

6. QUESTIONS AND REPLY FROM ELITHENI

a) Trust Registration

Mr Rudi Gerber requested the registration number and the details of the trustees of the Guba-Machubeni Development Trust.

Mr Deon Makatesi replied that two separate trusts have been established, namely the Guba Land Trust and secondly the Guba Machubeni Development Trust. No details of the trusts could be provided, but would be forwarded upon request. Mr Gerber said he would request it from Mr Kibi via e-mail the following day.

b) Trust Deed & Auditors

Mr Rudi Gerber requested if details of the Guba-Machubeni Development Trust's Deed and its Auditors could be forwarded. Mr Rudi Gerber stated the reason for this is, because when SMME's are proposed, then prospective suppliers of services and goods need to be duly registered; have a bank account and registered at SARS – the South African Revenue Services.

Mr Deon Makatesi replied that the auditors of the trust are "Charter and Barnes Inc." and their offices are located in Queenstown.

7. CONCLUSIONS

Everyone at the meeting recognised that this project has many benefits for the community development of the Emalahleni area and in particular the immediate Guba-Hoek area. Everyone supports the project and wishes to see their requests being honoured by Elitheni Coal (Pty) Ltd during their mining project at its new Elitheni Dolerite Pit. This would be finalised after a community resolution had been obtained. The meeting was adjourned and a site inspection had followed.

Annexure 7 (Continues)
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Present at the site inspection were Mr. Rudi Gerber, Mr Deon Makatesi, Mr. Sam Kibi , Mr. Mongerieric Mpinka, Mr. Ntobeko Faleni and Mr. Johann Gerber. Mr Makatesi expressed his satisfaction with the area of the proposed dolerite mining operation and would show it to other community members as well.

8. MEETING ADJOURNED

The site inspection party returned after the site inspection and adjourned the meeting at 13h50. Mr Rudi Gerber undertook that Algoa Consulting Mining Engineers would provide copies of the minutes within 48 hours in electronic format to all concerned. Mr Ntobeko Faleni would hand deliver hard copies thereof to Mr DM Makatesi should he not have access to electronic media.

Annexure 7 (Continues)

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9. ANNEXURE A : NOTIFICATION & REPLY FORM

Notice is hereby given in terms of Sections 10 & 27(5)(b) of the Mineral & Petroleum Resources Development Act 28 of 2002 of intent to carry out the following activity :

ELITHENI COAL (PTY) LTD intend to establish a 1½ hectare mining permit quarry on a portion of the Machubeni 3 Allotment area, in the Emalaheni Local Municipal district.

In order that you are identified as an interested - and/or affected party, submit your name ; contact information ; details of your interest and your comments in the matter to Mr Rudi Gerber by 20 September 2011. Submissions should be made in writing to Algoa Consulting Mining Engineers ; P.O. Box 16501 ; Emerald Hill ; 6011 ; or by facsimile to 0866577703.

KENNISGEWING VAN OORLEGPLEGING MET BELANGHEBBENDE & GEAFFEKTEERDE PARTYE

Kennis geskied hiermee kragtens Artikels 10 & 27(5)(b) van die Minerale & Petroleum Hulpbronontwikkelingswet 28 van 2002 om die volgende aktiwiteite uit te voer :

ELITHENI COAL (EDMS) BPK is van voorneme om 'n 1½ hektaar myn-permit oopgroefmyn te vestig op 'n gedeelte van die Machubeni 3 - Area in die Emalaheni Plaaslike Munisipale distrik.

Ten einde te verseker dat jy as 'n belanghebbende en/of geaffekteerde party geïdentifiseer word, stuur jou naam ; kontakbesonderhede ; besonderhede van jou belang en enige opmerkings in die saak aan Mnr Rudi Gerber teen 20 September 2011. Voorlegging moet skriftelik gerig word aan Algoa Consulting Mining Engineers ; Posbus 16501 ; Emerald Hill ; 6011 ; of per faks by 0866577703.

Annexure 7 (Continues)

Algoa consulting mining engineers cc

Office 9; Moffet on main life style center; C/O main Road. E William Moffat; Warmer, PE6001

P.O.Box 16 501, Emerld Hill,

6011. R SA

E-mail rudi@ algoacme.co.za

Ref.nr: Elitheni Dolerite-EC 30/5/1/3/2/10010MP Contact details of interested and affected party

Name : Guba/ Machubeni Development Trust
P.O.Box 610
Queenstown
5320

Tel : 045 8588 228

Mobile : 072 671 9697

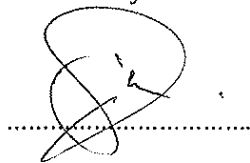
E-mail : sam.kibi@yahoo.com

Please list your comments on the project

We the Guba/ Machubeni Dev. Trust representing 35 directly affected villages where you have an interest of opening a Dolerite mining , want to present our comments as follows:-

- We disapprove the issuing of a mining permit on an area adjacent to the proposed coal mining by Elitheni Coal.
- We object the application of a mining permit on the basis that the community will not benefit in a mining permit.
- We further propose that your application should be an extension of a bigger mining right because is just adjacent to the mining right whereby the communities can have a meaningful stake in the shareholding
- The community also want clarity on your BEE beneficiation ie 26% stipulated in your documents.
- Hoping that this response will reach your office at your earliest convenience.
- We Gubal/ Machubeni Community Dev Trust confirm that we have received the public consultation notice

Yours truly



Sam Kibi (Trust Secretary)

Date : 29/09/11

ID NO : 520914 5728 087

10.8 Annexure 8 : Palaeontological Impact Assessment

Lodged electronically via the SAMRAD System

10.9 Annexure 9 : Archaeological Impact Assessment

Lodged electronically via the SAMRAD System