



**the dme**

Department:  
Minerals and Energy  
**REPUBLIC OF SOUTH AFRICA**

DME 12

Private Bag X6076, Port Elizabeth 6000,  
Tel: (041) 396 3900  
Fax: (041) 396 3946  
Cnr. Diaz and Mount Roads  
Mount Croix  
Port Elizabeth, 6001

Enquiries: D.A. Watkins  
E-mail: deidre.watkins@dme.gov.za

Reference:  
Date:

EC30/5/1/2/3/2/1(0211)EM  
13 October 2009

South African Heritage Resources Agency  
P.O. Box 758  
**GRAHAMSTOWN**  
6140

ATTENTION: MR. T. LUNGILE

Case ID: 2400

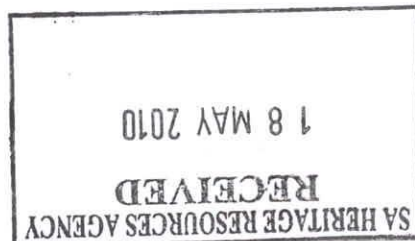
Sir

**CONSULTATION IN TERMS OF SECTION 40 OF THE MPRDA OF 2002: SAND AND STONE MINING ON FARM PAPENKUILS VLEY NO. 299, IN THE NELSON MANDELA METROPOLITAN MUNICIPALITY, DIVISION OF UITENHAGE**

1. Attached herewith, please find a copy of the EMP received from Inzulu Mining Company (Pty) Ltd, for your comments.
2. Please forward any written comments or requirements your department may have in this regard, to this office no later than **11 December 2009**. Failure to do so, will lead to the assumption that your department has no objection(s) or comments with regard to the said document.
3. Consultation in this regard has also been initiated with other relevant State Departments.
4. Kindly quote the relevant file reference number in all correspondence.

Sincerely,

**REGIONAL MANAGER  
EASTERN CAPE**



1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

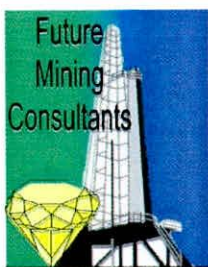
# ENVIRONMENTAL MANAGEMENT PROGRAMME

**INZULU MINING CO (PTY) LTD**

***SUBMITTED IN SUPPORT OF AN APPLICATION  
FOR A MINING RIGHT IN TERMS OF SECTION  
22 OF THE MINERAL AND PETROLEUM  
RESOURCES DEVELOPMENT ACT, 2002 (ACT  
28 OF 2002), ON PORTION OF THE FARM  
PAPENKUILS VLEY 299, MAGISTERIAL  
DISTRICT OF UITENHAGE.***

**EASTERN CAPE**

**OCTOBER 2009**



COMPILED BY FUTURE MINING CONSULTANTS ©







Future Mining Consultants (FMC) compiled this Report. FMC holds copyright © 2009. All rights reserved. This document or any part thereof may not be reproduced without the written consent of both the consultant and the applicant.

Contact details for the consultant are as follows:

Future Mining Consultants:

Postal Address: PO Box 53287, Wierda Park, 0149

Tel: 083 575 7671

Fax: 086 691 2411

E-mail: [futuremining@gmail.com](mailto:futuremining@gmail.com)

Please contact the above consultant with regards to all correspondence regarding this document.

**CONTENTS:**

Word Definitions	5
Background Information	10
PART 1 – SECTION 39(4)(a)(i) OF THE MPRDA	13
Chapter 1 – Description of the Existing Environment	13
Chapter 2 – Project Description	43
Chapter 3 – Environmental Impact Assessment	54
Chapter 4 – Socio-economic Impact Assessment	88
Chapter 5 – Heritage Impact Assessment	89
Chapter 6 – Environmental Awareness Plan	90
Chapter 7 – Mitigatory Measures for Significant Impacts	94
PART 2	112
Chapter 8 – Financial Provision for Rehabilitation	112
PART 3	114
Chapter 9 – Capacity to Manage and Rehabilitate the Environment	114
PART 4	121
Chapter 10 – Undertaking	121
ANNEXURE A	122
Map 1 – Regulation 2(2) Plan	123
Map 2 – Geology Plan	124
Map 3 – Hydrology Plan	125
ANNEXURE B	126

## **Tables and Figures**

Figure 1.2.1 Climatogram	14
Table 1.2.2 Rainfall	15
Table 1.2.4 Temperature	16
Table 1.2.7 Extreme Weather Conditions	17
Table 1.9.1 Notice Photos	24
Figures 1.14 Photos	30
Table 1.15.1 Socio-Economic Aspects	32
Table 1.17.1 Economic Impact of HIV/AIDS	41
Table 2.2.2 Forecast for annual Production Rates	47
Table 2.3 Mining Phases and Activities	51
Table 3.4.1 Possible Construction Phase Impacts	57
Table 3.4.2 Possible Operational Phase Impacts	58
Table 3.4.3 Possible Closure Phase Impacts	72
Table 3.4.4 Possible Post-closure Phase Impacts	77
Table 3.5.1 Impact Scale	79
Table 3.5.2 Construction Phase Impact Assessment	80
Table 3.5.3 Operational Phase Impact Assessment	81
Table 3.5.4 Closure Phase Impact Assessment	84
Table 3.5.5 Post-Closure Phase Impact Assessment	86
Table 3.6 Cumulative Impacts Assessment	87
Table 7.1.1 Construction Phase Mitigation Measures	94
Table 7.1.2 Operational Phase Mitigation Measures	94
Table 7.4 Mitigation Measures for Cumulative Impacts	101
Table 7.7 Frequencies of Mitigation Measures	102
Table 8.3 Quantum Calculation	113
Table 9.1 Cost of Management Measures	115

## **WORD DEFINITIONS:**

**In this document, unless otherwise indicated, the following words will have the meanings as indicated herein:**

<b><u>Word:</u></b> Act (The Act)	<b><u>Definition:</u></b> Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
<b>ARC – AGIS</b>	Agricultural Research Council's Agricultural Geo-referenced Information System.
<b>ARC – ISCW</b>	Agricultural Research Council Institute for Soil, Climate and Water.
<b>Archaeological</b>	Material remains resulting from human activities which are in a state of disuse and are in, or on, land and which are older than 60 years, including artefacts, human and hominid remains, and artificial features and structure.
<b>Authority</b>	National, regional or local authority, which has decision-making role or interest in the development
<b>Best Practicable Environmental Option (BPEO)</b>	BPEO is the outcome of a systematic consultative and decision-making procedure that emphasizes the protection of the environment across land, air and water. It establishes, for a given set of objectives, the option that provides the most benefit or least damage to the environment as a whole at an acceptable cost in the long term and as well as the short term.
<b>BID</b>	Background Information Document
<b>Biodiversity</b>	This refers to both the variety of different species of plants and animals, as well as genetic variability within species, which is essential in maintaining life-sustaining ecosystems.
<b>Biome</b>	A complex of communities of very wide extent, characterised by distinctive vegetation and climate.
<b>Borehole</b>	A hole drilled for the purposes of prospecting i.e. extracting a sample of soil or rock chips by pneumatic, reverse air circulation percussion drilling, or any other type of probe entering the surface of the soil.
<b>CARA</b>	The Conservation of Agricultural Resources Act, 1989
<b>Cultural resources</b>	The physical elements of both the built and natural environment, which are integral to a sense of shared identity.
<b>DEAT</b>	Department of Environmental Affairs and Tourism
<b>Development</b>	This is a broad term which refers to actions taken by individuals, communities, industry or government aimed at improving quality of life and fulfilling human potential. Measures of development include average income per person and reduced levels of poverty, unemployment and child mortality.



<b><u>Word:</u></b>	<b><u>Definition:</u></b>
<b>Disturbance</b>	Any event or series of events that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment.
<b>DME</b>	Department of Minerals and Energy
<b>DWAF</b>	The Department of Water Affairs and Forestry – both national office and their various regional offices, which are divided across the country on the basis of water catchment areas.
<b>EAP</b>	Environmental Assessment Practitioner
<b>EIA</b>	An Environmental Impact Assessment as contemplated in Section 38(1) (b) of the Act
<b>EMP</b>	An Environmental Management Plan as contemplated in Regulation 52 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).
<b>Endemic species</b>	Species with a distribution restricted to specific geographical areas. Endemism may occur on local, regional, sub continental or continental scales. Local endemism is usually associated with particular habitat requirements.
<b>ENPAT</b>	Environmental Potential Atlas
<b>Environment</b>	The external circumstances conditions and objects that affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical, cultural and political aspects.
<b>Environmental impacts</b>	The consequences of environmental aspects on environmental resources of particular value or sensitivity.
<b>Environmental incident</b>	<ul style="list-style-type: none"> <li>◆ Any action undertaken (or omitted) by the proponent or his duly appointed representatives (e.g. contractors) that results in overly/unnecessary disturbance or damage to the environment.</li> <li>◆ Any action undertaken (or omitted) by the proponent or his duly appointed representatives (e.g. contractors) that could lead to (has potential for) overly/unnecessary disturbance or damage to the environment.</li> <li>◆ Non adherence to environmental legal requirements/laws (including the stipulations of authorizations issued in respect of a proposed activity e.g. those contained in a Record of Decision).</li> </ul>
<b>Environmental Officer</b>	Independent environmental consultant appointed to monitor compliance with the EMP.
<b>Erosion</b>	A process that involves the wearing away of the land surface by mechanical or chemical action.
<b>Fauna</b>	All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
<b>Feasible</b>	Acceptable, capable of being used or implemented successfully, without unacceptably damaging the environment.

<b><u>Word:</u></b>	<b><u>Definition:</u></b>
<b>Fence</b>	A physical barrier in the form of posts and barbed wire and or any other concrete construction, ("palisade"- type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.
<b>Flora</b>	All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and capable of photosynthesis.
<b>GOSP</b>	Gauteng Open Surface Plan
<b>Ground water</b>	All subsurface water occupying voids within a geological medium.
<b>Habitat</b>	The natural environment of an organism. The living space occupied by an organism. Physical surroundings in which an organism is likely to be found.
<b>House</b>	Any residential dwelling of any type, style or description that is used as a residence by any human being.
<b>I&amp;AP</b>	Interested and/or affected party
<b>Infrastructure</b>	Refers to permanent physical structures such as roads, storm water drains and electricity lines.
<b>Land-use</b>	The actual or permitted activities on a defined piece of land.
<b>MAMSL</b>	Meters above mean sea level
<b>MAP</b>	Mean Annual Precipitation
<b>Mitigation measures</b>	Mitigation measures encompass all actions taken to eliminate offset or reduce potentially adverse environmental impacts to acceptable levels (World Bank, 1999:1).
<b>MPRDA Regulation</b>	Mineral and Petroleum Resources Development Regulation in terms of Government Notice R527, published on 23 April 2004.
<b>NDA</b>	National Department of Agriculture
<b>NEMA</b>	National Environmental Management Act (Act 107 of 1998)
<b>NWA</b>	National Water Act, Act 36 of 1998
<b>Pit</b>	Any open excavation
<b>Pollution</b>	The introduction of substances into the environment, which can have a negative effect on human health or the quality of the environment.
<b>"Porrel"</b>	The term used for the sludge created at alluvial diamond diggings where the alluvial gravels are washed and the diamonds separated in a water-and-sand medium.
<b>Project activities</b>	Those activities or actions of a project which are likely to give rise to an impact on the environment.



<b><u>Word:</u></b>	<b><u>Definition:</u></b>
<b>Proponent</b>	An individual and/or organisation that is of the intention to undertake an activity identified in terms of Section 21 of the Environmental Conservation Act, 1989 (Act no. 73 of 1989). Typically a proponent, <ul style="list-style-type: none"> <li>◆ stands to benefit directly from the proposed activity (e.g. a private developer gaining financially), or</li> <li>◆ is duly sanctioned in terms of its legal mandate (e.g. a government department) to undertake such activities for the attaining of its objectives.</li> </ul>
<b>Red data species</b>	Species of animals and plants recognized internationally as having a high conservation value or which are being threatened through natural or unnatural causes.
<b>Resource</b>	Any goods, services or environmental conditions which may have the potential to enhance social well being.
<b>Risk</b>	The scientific judgement of probability and significance of harm to the environment.
<b>ROD</b>	Record of Decision
<b>SAHRA</b>	South African Heritage and Resource Agency
<b>Scoping</b>	A procedure for narrowing the scope of an assessment and ensuring that the assessment remains focused on the significant issues or impacts. Scoping requires input from authorities and the public.
<b>Significant</b>	Factors or considerations are termed significant when they are important, because they are of consequence. For example, they will have a detectable influence on a process, the environment, or the end result.
<b>Species</b>	A group of organisms with distinctive characteristics and which remain distinct by virtue of barriers to interbreeding with other kinds of organisms.
<b>Tc (Time of concentration)</b>	This is the time it would take for a drop of water to flow along the furthest drainage path to the exist point of a defined catchment area.
<b>Threatened</b>	Used to describe the status of a species or population of a species, which has deteriorated through natural or unnatural causes to the point where it may be considered as rare, vulnerable or endangered.
<b>Topsoil</b>	<ul style="list-style-type: none"> <li>◆ The layer of soil covering the earth which-</li> <li>◆ provides a suitable environment for the germination of seed;</li> <li>◆ allows the penetration of water;</li> <li>◆ is a source of micro-organisms, plant nutrients and in some cases seed;</li> <li>◆ and is not of a depth of more than 0,5 metres or such depth as the Minister may prescribe for a specific prospecting or exploration area or mining area.</li> </ul>

**Word:****Trench****Definition:**

A type of excavation usually made by digging in a line towards a mechanical excavator and not pivoting the boom – a large, U-shaped hole in the ground, with vertical sides and about 6 – 8 metres in length. Also a prospecting trench.

**Vegetation**

Any and all forms of plants, see also Fauna

**Water – “Clean Water”**

Any water that originates outside of the mining area, entering the mining area through overland flow, lateral subsurface flow, or any other natural movement of water.

**Water – “Clean Water System”**

Any dam, other form of impoundment, canal, works, pipeline and any other structure or facility constructed for the retention or conveyance of unpolluted water.

**Water – “Dirty Water”**

Any water that originates within the mining area, either as a result of precipitation or as part of mineral processing, as well as untreated sewage and Grey Water.

**Water – “Dirty Water System”**

Any dam, other form of impoundment, canal, works, pipeline, residue deposit and any other structure or facility constructed for the retention or conveyance of water containing waste.

**Water – “Grey Water”**

Domestic Waste water not containing sewage.



## **Background Information:**

### **Introduction:**

Inzulu Mining Co (Pty) Ltd (hereinafter referred to as "the Company") is a relatively small mining concern which has already secured a 35% black economic partnership. Please refer to the shareholder's certificates and shareholder's agreement, respectively, attached to the social and labour plan.

The Company has acquired a mining licence, namely Mining Licence No 41/2001 ML, in terms of section 9 of the repealed Minerals Act, 1991, (Act 50 of 1991), in respect of an adjacent property, namely the remaining extent of the farm Rietheuvel 296, Magisterial District of Uitenhage, which right expires on 1 October 2010. The Company applied in October 2008 for conversion of the said used old order mining right in terms of Item 7(2), Schedule II, of the Mineral and Petroleum Resources Development Act, 2002, hereinafter referred to as "the said Act", to a new order mining right contemplated in section 22 of the said Act, in respect of the corresponding area (which includes the plant and related activities), as shown on the plan attached to the mining work programme.

The above application is mainly lodged as to expand the current sand and stone reserves. The mining and related activities on the proposed mining area will be conducted with the same equipment and personnel compliment as on the original mining area. The beneficiation of the stone will also take place in the same crushing and screening plant, which will for the time being remain on the original area.

It should be understood the Company and Sunshine Coast Crushers CC, hereinafter referred to as "the CC"), concluded a "Mining Licence Agreement" (attached to the social and labour plan), whereby the sole right to mine sand on the ***said adjacent property*** were granted to the CC. All equipment and personnel are therefore provided by the CC and it will be observed that the Company and the CC co-signed the declaration/undertaking in regard to both the mining work program and the social and labour plan attached to the said application for conversion. Although the accountability with regards to the implementation and execution of the existing approved environmental management programme still lies with the Company, the responsibility for same was, in terms of the said agreement, transferred to the CC. It is important to note that the term "the Company" where referred to in this document, will include both "the Company" and "the CC" as one legal person.

The Amanzi Estate, on which the mining area is situated, is most certainly not an unspoilt natural environment as it has historically been extensively disturbed by agricultural and activities incidental thereto, namely citrus farming and grazing for Dorper sheep. The Estate was and is being partially mined at present, whilst the establishment of a golf course development on a portion thereon is already in an advanced stage. Although the mining area in question was mainly utilised for grazing, one can expect that it had lost most of the indigenous fauna and flora as a result of all these activities and disturbances.

**Details of the Applicant:**

Company Name:	Inzulu Mining Co (Pty) Ltd
Company Registration Number:	2003/010519/07
Contact Person:	Mr Phillip Niven
Telephone Number:	(041) 366 1165
Cell No:	082 327 1577
Fax Number:	086 680 0563
Physical Address:	Ptn of Papenkuils Vley 299, Uitenhage
Postal Address:	P O Box 5780 Walmer 6065
Email:	<a href="mailto:inzulumining@gmail.com">inzulumining@gmail.com</a>

**Regional Setting:**

The mine is situated on portion of the farm Papenkuils Vley 299, Magisterial District of Uitenhage (hereinafter referred to as "the mining area") and 12 kilometres South-East of Uitenhage. See **Map 1 – Regulation 2(2) Plan** attached hereto as **Annexure A**.

**Nature and Extent of the Development:**

This mining application is located adjacent to the existing mining license issued in terms of the Minerals Act. The area is approximately 82 hectares in extend. Mined materials will be removed from the mining area to the existing processing plant located on the adjacent Amanzi mine.

**Existing Rights, Licenses and Permits:**

The Company has acquired a mining licence, namely Mining Licence No 41/2001 ML, in terms of section 9 of the repealed Minerals Act, 1991, (Act 50 of 1991), in respect of an adjacent property, namely the remaining extent of the farm Rietheuvel 296, Magisterial District of Uitenhage, which right expires on 1 October 2010. The Company applied in October 2008 for conversion of the said used old order mining right in terms of Item 7(2), Schedule II, of the Mineral and Petroleum Resources Development Act, 2002, hereinafter referred to as "the said Act", to a new order mining right contemplated in section 22 of the said Act, in respect of the corresponding area (which includes the plant and related activities), as shown on the plan attached to the mining work programme.



## **PART 1 – SECTION 39 (4) (a) (i) OF THE MPRDA**

### ***Chapter 1 – Description of the Existing Environment:***

*MPRDA Regulation 50 (a)*

*MPRDA Regulation 50 (a)*

*MPRDA Section 39 (3) (a)*

#### **1.1. Geology:**

The Uitenhage Group comprises the underlying geology in the area.

The Uitenhage Group was deposited during the Cretaceous Period. The sedimentary basins are fault basins, formed due to tension produced during the break-up of Gondwanaland. Three main formations occur in the Uitenhage Group: the Enon Formation, the Kirkwood Formation and the Sunday's River Formation.

The Enon Conglomerate consists of reddish-brown, coarse-grained conglomerate containing pebbles cobbles and boulders, typically of quartzite and other hard rocks. The Enon Formation was deposited in the form of alluvial fans by rivers draining the Cape Fold Belt Mountains.

The Kirkwood Formation overlies the Enon Conglomerate and consists of a succession of sandstone and shale. The Kirkwood Formation was deposited in channels and the floodplains along the lower reaches of the same Cretaceous-age rivers that deposited the Enon gravels higher upstream.

The Sunday's River in turn overlies the Kirkwood formation and consists of a thick succession of shale. The Sunday's River Formation was deposited in shallow marine embayment during the Cretaceous Period.

Tertiary to recent deposits overlie the Uitenhage Group. These deposits consist of sand, gravel, silt and clay and are generally less than 15m thick and restricted to the river valleys (Department of Water Affairs and Forestry, 1996).

According to the 1:250 000 geological Map 3324 Port Elizabeth the geology underlying the area consists of sand, silt and clay of the Kirkwood formation and the Uitenhage Group.

The location of the mineral deposit is shown on the **Map 2 – Geology Plan** attached hereto as **Annexure A**.



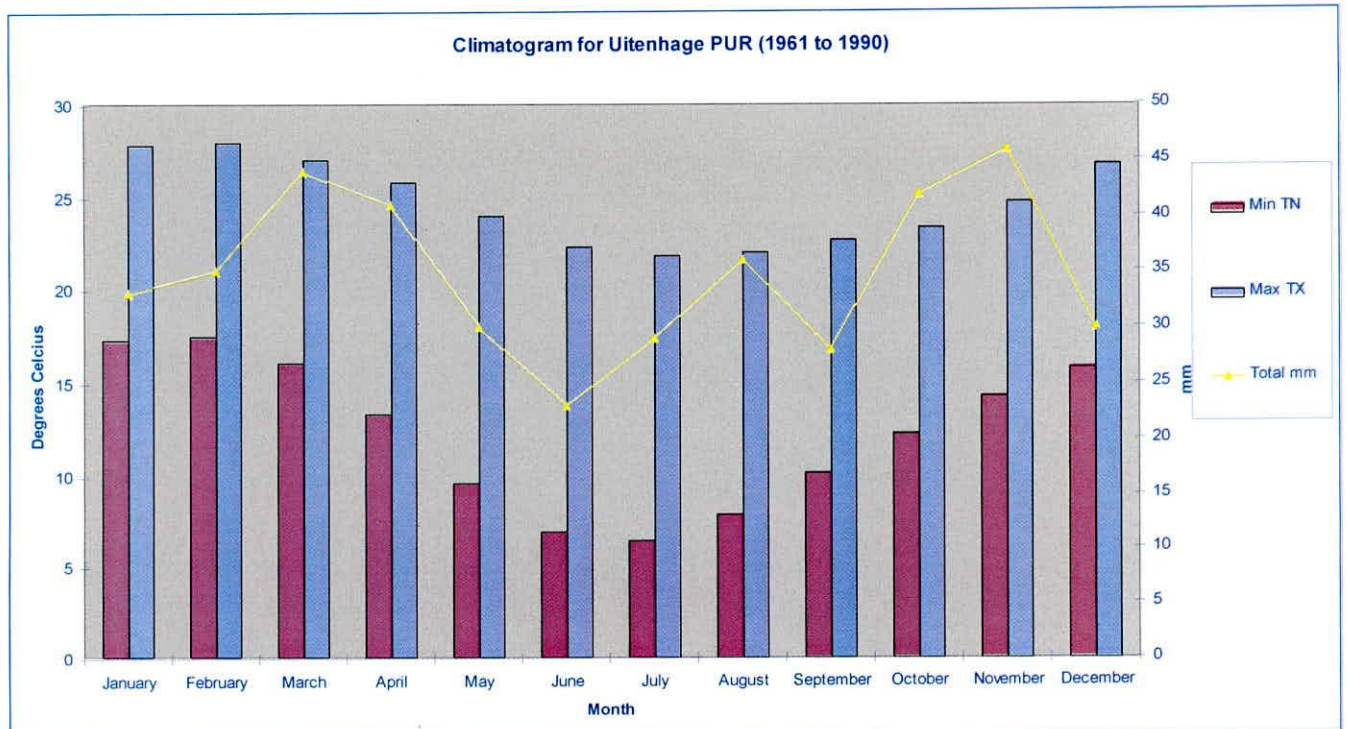
## 1.2 Climate:

### 1.2.1 Regional Climate:

According to the Köppens classification (after B.R. Schulze) the climate occurring within the region of the proposed mining area is classified as subtropical (Cfb'), with all months between 10 and 22 degrees Celsius and all months with at least 60mm of rain. The region receives an annual rainfall of approximately 500mm.

Weather data were collected from an automatic weather station at Uitenhage (the closest weather station). The weather station (station number 0034767) is located at 33° 47' S and 25° 26' E at a height of 32m above mean sea level. This data is summarized below.

The following climatogram: 1.2.1 indicates the monthly changes in key weather indicators



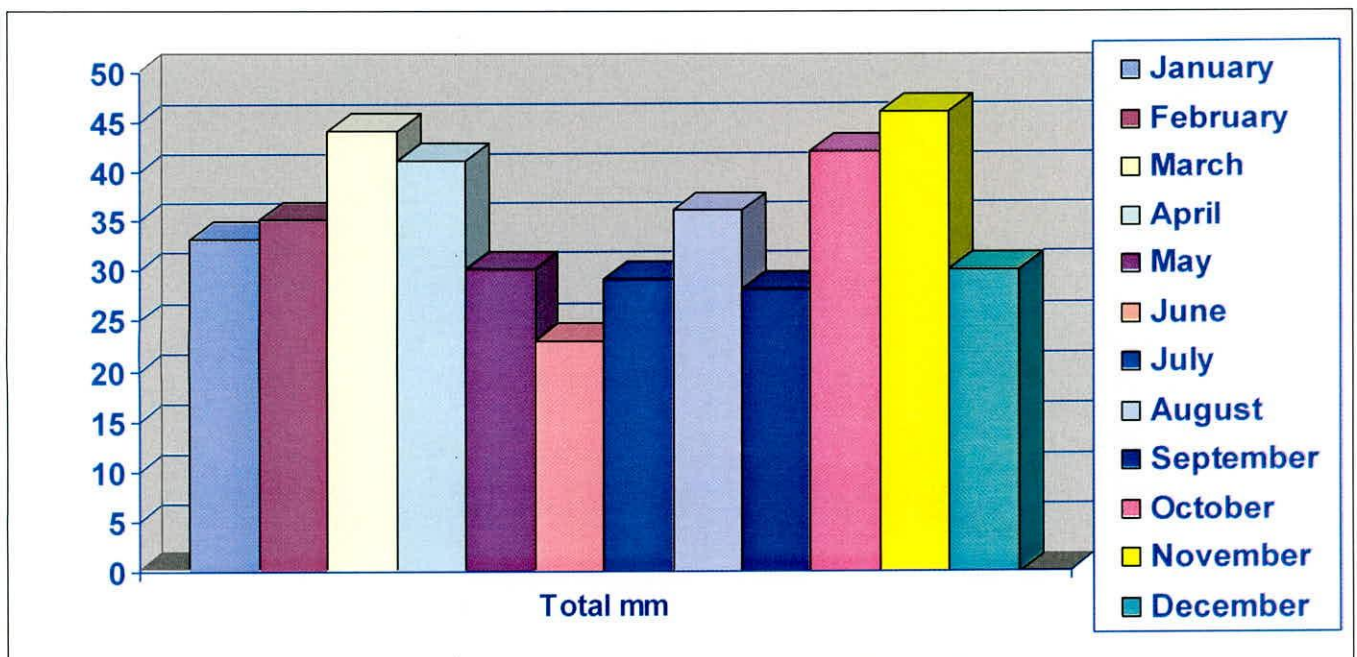
**Figure 1.2.1 Climatogram**

## 1.2.2 Mean Monthly and Annual Rainfall for the Site and Number of Days per Month with Measurable Precipitation.

Table 1.2.2: Average Monthly Rainfall Data for the Uitenhage Weather Station for the Period 1961 to 1990.

Month	Total mm
January	33
February	35
March	44
April	41
May	30
June	23
July	29
August	36
September	28
October	42
November	46
December	30
<b>Year Total</b>	<b>417</b>

The following indicates the monthly rainfall for the Uitenhage Weather Station for the Period 1961 to 1990.





### 1.2.3 Rainfall Intensities

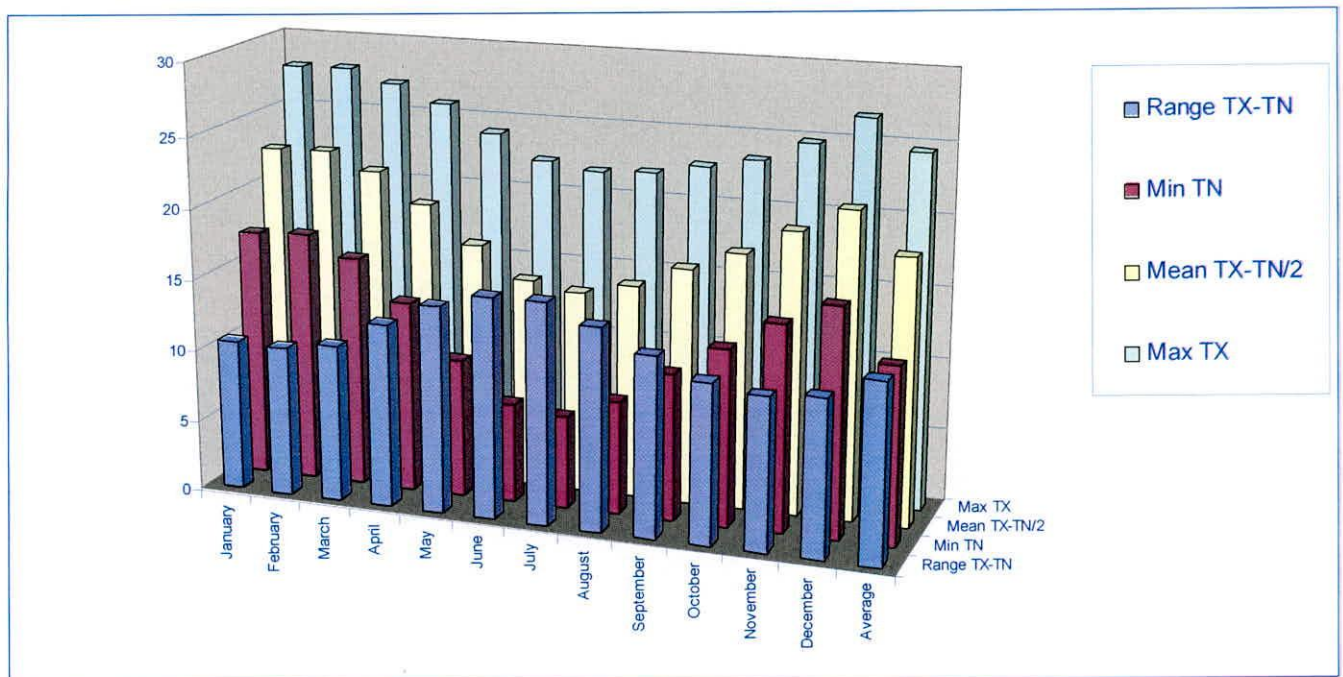
This information is unavailable for the study area

### 1.2.4 Mean Monthly, Maximum and Minimum Temperatures

Table 1.2.4: Average of Daily Temperatures Recorded for the Uitenhage Weather Station During the Period 1961 to 1990.

Month	Max TX	Min TN	Mean TX-TN/2	Range TX-TN
January	27.8	17.3	22.6	10.5
February	27.9	17.5	22.7	10.4
March	27.0	16.1	21.5	10.9
April	25.8	13.0	19.4	12.8
May	24.0	9.6	16.8	14.4
June	22.3	6.9	14.6	15.4
July	21.8	6.4	14.1	15.4
August	22.0	7.9	14.9	14.1
September	22.7	10.2	16.4	12.5
October	23.4	12.3	17.8	11.1
November	24.8	14.3	19.6	10.6
December	26.8	15.9	21.4	10.9
<b>Average</b>	<b>24.7</b>	<b>12.3</b>	<b>18.5</b>	<b>12.4</b>

The following indicates the average daily temperatures for the Uitenhage Weather Station for the Period 1961 to 1990.



### 1.2.5 Wind Direction and Speed:

Wind data for Uitenhage could not be obtained, but south-westerly winds are dominant in the Port Elizabeth area, with 20.2 percent calms.

### 1.2.6 Evaporation:

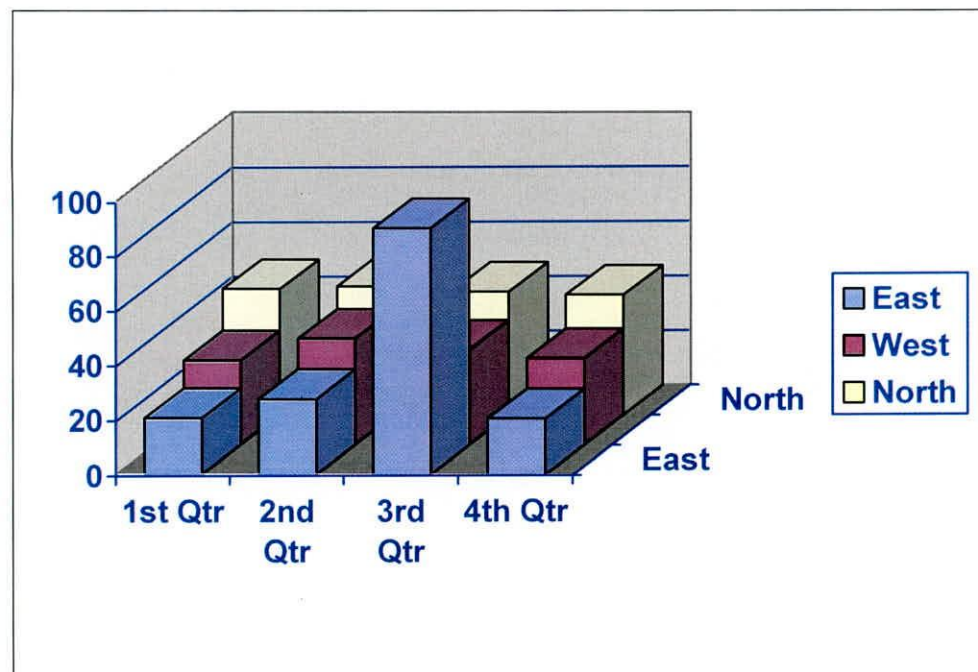
The Uitenhage Weather Station does not record evaporation rates.

### 1.2.7 Extreme Weather Conditions

Table 1.2.7: Record of Extreme Weather Conditions – Uitenhage Weather Station for the Period 1961 to 1990.

	<i>Number of days with:</i>	
<b>Thunderstorms</b>	Hail	Fog
1.0	1.2	0.4
2.4	0.1	0.7
1.6	0	2.0
1.0	0.1	2.0
0.7	0	2.5
0.5	0	1.4
0.3	0	2.2
0.1	0	1.5
0.7	0.1	0.
1.1	0.4	0.25
1.2	0	0.4
1.2	0	0.4
12	1	14

The following indicates the average Extreme Weather Conditions for the Uitenhage Weather Station for the Period 1961 to 1990.





### 1.3 **Topography:**

The overall topography of the general area of the proposed mining area is relatively flat, with no prominent topographical features. The site lies adjacent to the Coega River, on the floodplain. The site topography is relatively flat and slopes very gently in the direction of the river. The site elevation is approximately 89m above mean sea level.

See **Map 1 – Regulation 2(2) Plan** and **Map 4 – Hydrology Plan** attached hereto as **Annexure A**.

### 1.4 **Soil:**

Harman (1988) classifies the soils occurring in the vicinity of the proposed mining area as “weakly developed lime rich soils”.

Approximately 30 percent of the Eastern Cape is covered with lime rich soils, which are generally shallow and often associated with rocky land. Typical soil series found in hill slope positions are Smithfield, Lekfontein, Muden and Swartland. In the plains the Shilago Craven and Broekspruit soil series dominate. This category also possesses relatively deep and well-drained soils that are associated with the floodplains of the major rivers that incise the landscape, such as in the case of the proposed mining area. Some 18 000 ha of the soils found in these river valleys are currently under scheduled irrigation. Typical soil series found here are Shilago, Hardpan, Dudfield and Dundee.

### 1.5 **Land Capability:**

The land capacity will mainly be grazing

### 1.6 **Land use:**

- **Pre mining land use:**  
The land is not in use at the moment, its intention was for citrus farming but because of the economic state the land owner decided to rather mine on the mine area.
- **Historical Agricultural Production:**  
On the adjacent farm there is citrus farming and mine of same. There is currently a golf estate in process of being established on the same owners farm adjacent to the mine.
- **Evidence of Misuse:**  
There is no evidence of misuse, the ground was formally used for grazing.
- **Existing structures.**  
No existing structures are to be found. See **Map 1 - Regulation.2(2) Plan** attached hereto as **Annexure A**.

## 1.7 **Flora:**

### 1.7.1 **Introduction:**

The diverse geology, relief, climate and soils of the Eastern Cape provide for the flora, which is noted for its phytogeographical complexity. The flora is transitional between Cape flora and subtropical flora. Many taxa of diverse phytogeographical affinities reach the limits of their distribution in this region. The Eastern Cape can best be described as a tension zone where four major biomes converge and overlap. All of the major vegetation types of South Africa i.e. forest, fynbos, thicket, karroo, grassland and savanna, occur within the Eastern Cape region forming a complex mosaic of communities composed of a diverse flora of mixed origins and affinities.

The importance of the families typical of Cape flora (e.g. Ericaceae and Aizoaceae) decreases as on moving eastwards, they are replaced by families of the subtropical region (e.g. Gramineae and Asclepidaceae). Thicket, described as being of Tongaland-Pondoland affinity, enters the region along the east coast and penetrates up the river valleys. Succulent and dwarf subdesert shrublands of the Karoo-Namib region extend down the dry river valleys from the arid interior. Afromontane elements extend down the mountains to sea level in the south-western region of the Eastern Cape, where the coastal forests are composed of many Afromontane species. Fynbos taxa of the Cape region are common on the infertile sandy soils derived from the Cape Supergroup rocks.

According to Low and Rebelo's (1996) classification the site of the mining area lies within an area where the Mesic Succulent Thicket vegetation type historically occurs.

#### 1.7.1.1 **Mesic Succulent Thicket**

#### 1.7.1.2 **Synonym** Valley Bushveld (A23)

#### 1.7.1.3 **Statistics**

1 931 km<sup>2</sup>; ± 51 percent transformed; 5.33 percent conserved.

#### 1.7.1.4 **Vegetation**

The height of the vegetation is about 2.5m consisting mainly of spinescent shrub and woody creepers with many succulents. Apart from the alien plant species referred to below that might have been introduced due to the area formally being used for grazing, the diversity is relatively high with a proportion of endemics. Characteristic woody species include dune kokotree *Maytenus procumbens* and Septemberbush *Polygala myrtifolia*, while succulent species such as Uitenhage aloe *Aloe Africana*, bitter aloe *A. ferox*, noorsdoring *Euphorbia ledienii* and *E. grandidens* may be common.



### 1.7.1.5 Site Botanical Description

The site vegetation currently comprises pioneer vegetation with grasses and annuals dominating. Common grasses are *Eragrostis curvula* and *Cynodon dactylon*. *Phragmites* reeds are also common on site. On the south-eastern side of the property, in close proximity to the Coega River, there is an increased number of woody species, with indigenous shrubs such as *Plumbago spp.* occurring. Alien *Acacia* trees were noted to be invading the site.

### 1.7.1.6 Endangered or Rare Species

No endangered or rare species were recorded for the proposed mining area.

### 1.7.1.7 Intruder or Exotic species

The proposed site is degraded by former agricultural use (grazing) and alien plant species are numerous. Prominent woody alien plants occurring include *Acacia spp.*, *Pinus spp.*, *Eucalyptus spp.* and *Casuarinas pp.* (Beefwood).

#### Declared weeds and invader plants in South Africa



The Conservation of Agricultural Resources Act, No. 43 of 1983, as amended in March 2001, sets out the regulations regarding the control of weeds and invasive plants and provides a list of declared plants, in which they are divided into three categories. There is an exception in the regulations regarding biological control

reserves. These are areas where permission is granted for declared plants not to be controlled because they are used for introducing and monitoring biological control agents (e.g. insects).

In total there are 200 species of plants that are declared weeds or invaders in South Africa. These include 121 woody species, 16 succulent species, 44 herbaceous species, 9 grasses and reeds, and 10 aquatic species. They are divided into three categories: Category 1 species are declared weeds and totally prohibited, Category 2 plants are invasive species for which permission can be obtained to grow them commercially in demarcated areas but otherwise they must be removed, and Category 3 invasive plants can be maintained on your land if they are plants that were already growing at the time these regulations were promulgated (March 2001). All other Category 3 plants must be removed (a good example of this is the Jacaranda). Irrespective of the category, all declared plants growing within 30 m of the 1:50 flood line of a river or waterbody must be removed. Exceptions to these regulations can be obtained special, written permission.

**Category 1 declared plants** (Section 15A of the said amended Act):

- May not occur on any land or inland water surface other than in biological control reserves.
- Must be controlled by the land user on whose land or inland water such plants are growing.
- May not be planted or propagated.
- May not be imported or sold; and
- May not be acquired.

Exempted from the above regulations may be obtained through written exemption from "the executive officer", provided there is a good reason for same.



## 1.8 **Fauna:**

### 1.8.1 **Introduction:**

The Coega River area is important for the birds, reptiles and invertebrates, which occur. Information on the invertebrate fauna, apart from butterflies, is scarce. One endemic grasshopper and three butterflies of interest have been recorded for the area. The grasshopper, *Acrotylos hirtus*, is endemic to the dunefields or Algoa Bay and will not be impacted on by the proposed quarry operation. Three Lycaenid butterflies (coppers and blues) have been identified as rare or have very restricted distributions in the Coega River area. These are *Aloeides clarki* (a small copper). The Amanzi farm is outside the distribution of the butterflies and the quarry will not have any impact on the butterfly populations.

### 1.8.2 **Vertebrates**

#### 1.8.2.1 **Amphibians**

It is not known how many amphibian (frog) species occur in the Coega area, but the Eastern Cape has a diverse amphibian fauna, including 34 taxa (species and subspecies – CSIR 1997). Generally, frogs are useful bio-indicator species, as their reliance on both aquatic and terrestrial habitats at different stages of their life cycles, their need for damp habitats, and their permeable skins makes them vulnerable to pollutants and other anthropogenic effluents.

Numerous amphibians are likely to be found in the variety of habitats offered by the Coega River, which borders on the proposed quarry. The quarry operation will not impact on the River but a setback from the river is recommended to ensure that the integrity of the river is not compromised by the activities.

#### 1.8.2.2 **Reptiles**

The reptile fauna of the area is particularly diverse, containing 56 species of lizards, chameleons, snakes, tortoises and sea turtles. Of these, 22 species are either Red Data, listed under the Convention on the Illegal Trade in Endangered Species, or are endemic to the area or peripheral to the usual range of the species (Coastal and Environmental Services, 2001). These include eight lizards, two monitors, one gecko, one chameleon, three snakes, three tortoises and the four globally endangered sea turtle species. The most restricted range belongs to the Albany dwarf adder (*Bitis albanice*), recently described from the Coega area (Branch 1999).

The Amanzi Farm has been under intensive agriculture use for several decades and it is unlikely that any of the sensitive species occur on the farm. The areas identified for the quarry are totally transformed and do not contain any intact natural habitat.

### 1.8.2.3 Aves

Among the large terrestrial birds, blue crane (*Anthropoides paradiseus*), Stanley's bustard (*Neotis denhami*), martial eagle (*Polematius bellicosus*) and the African marsh harrier (*Circus ranivorus*), secretary bird (*Sagittarius serpentarius*) and Knysna woodpecker (*Campethera notata*) are listed as Red Data Species (Barnes 2000). While the above species may utilise sections of the Amanzi farm, none of the birds are known to breed in the Coega area.

### 1.8.2.4 Mammals

Only two mammal species are endemic to the Coega area: Duthie's golden mole (*Chlorotalpa durhiae*) and the pygmy hairy-footed gerbil (*Gerbillurus paeba exilis*) which occur in dune thicket (CES 2001). It is unlikely that these species are found on the Amanzi Farm.

While the proposed mining area is totally transformed it is likely that duiker, bushbuck and kudu still occur in the natural areas of the farm. Duiker and Bushbuck may utilise the riverine vegetation along the Coega River.

### 1.8.2.5 Endangered or Rare Species

No rare or endangered species are expected to occur on or in close proximity to the proposed mining area.

## 1.9 **Surface Water:**

The Coega River is a non-perennial river, which runs adjacent to the proposed mining area. The Coega River borders the proposed site in the northeast and the southeast. **It should however be mentioned that on the said Regulation 2(2) plan it is specifically mentioned that no mining will take place within a buffer zone of 50 metres from the said river. All mining and activities incidental thereto will therefore be prohibited and it will be declared a no go area by mine management and an example of the notices that will be placed on site as to impose same is provided directly below. The reason for this being the high biodiversity of the area close to the river and the possible pollution of same due to mining and activities incidental thereto.**







The catchment of the Coega River covers approximately 550km<sup>2</sup>, and is 45km long and 15km wide (CSIR 1997). The Coega River is a sand-bed river and is diverted into an earth channel about 3.3km upstream of the river mouth. A commercial solar salt works is located within the flood plain of the Coega River downstream of the N2 highway bridge. During floods the water may overtop the bank of the channel and inundate the salt works (De Souza and Mackintosh, 2002).

A river classification study has been done for the Coega River that assigns particular classes to the river based on its existing ecological state (Gibb, 1999). The lower reach of the Coega River was classified as category "F". This is the lowest category and indicates the river is "Critically modified: Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat" (Gibb, 1999).

Preliminary monitoring of the flow conditions of the Coega River has been undertaken (SRK, 2001). The results show that although the Coega River is classified as a perennial river, periods of low and no flow occur.

### 1.9.1 **Surface Water Quantity:**

See **Map 3 – Hydrology Plan** attached hereto as **Annexure A**. The mine is located in M30A quaternary catchment area in the Fish to Tsitstikama Water Management Area.

Rainwater draining from the mine area will drain in a Northerly direction before collecting in a series of non-perennial watercourses to the north of the mine. Due to the nature of mining activities, all dirty water, as defined by the Department of Water Affairs and Forestry (DWAF), will collect within the mining area, from where it will seep into the groundwater system or evaporate.

The following table indicates the catchment area characteristics of the affected catchment area. It is important to note that the method used to calculate the MAR (mean annual run-off) does not consider a variation in mean annual rainfall or the effects of infiltration and evaporation. This results in a calculated MAR that is different from the normal natural mean annual runoff. One catchment area were evaluated, namely for the quaternary catchment area.

<b>Catchment Area</b>	<b>Catchment M30A</b>
<b>Area (km<sup>2</sup>)</b>	258
<b>Rainfall (mm)</b>	451
<b>MAR (m<sup>3</sup>)</b>	5.064

**Table 1.9.1 Catchment areas**



### **1.9.2 Surface Water Quality**

Due to the fact that the said Coega river is non-preferential, no baseline for surface water quality was determined.

### **1.9.3 Drainage Density:**

No information in this regard was available from Department of Water Affairs and Forestry (DWAF)

### **1.9.4 Surface Water Use:**

Within the general vicinity of the proposed mining area, the Coega River is likely to be used for agricultural use. However recent monitoring has indicated that the flow of the river is unpredictable and that there are also periods of no and low flows.

### **1.9.5 Water Authority:**

The relevant water authority in this instance would be the Department of Water Affairs and Forestry –Fish to Tsitsikama Catchment Management Area.

### **1.9.6 River Diversions:**

There is no river diversions required by mining operations.

### **1.9.7 Wetland**

Besides the Coega River itself, no significant or important wetland is located in the vicinity of the proposed mining area.

### **1.10 Groundwater:**

The Uitenhage Artesian Basin is South Africa's most important artesian groundwater basin, supplying approximately 1400 MI/Year of water from springs to Uitenhage (approximately 15% of Uitenhage's total municipal requirements), as well as providing irrigation water to large citrus farming activities (Maclear, 2001). The aquifer comprises fractured Table Mountain Group sandstones confined in the eastern part of the basin by overlying siltstones and mudstones of the Kirkwood Formation (Uitenhage Group). The Uitenhage Artesian Basin comprises two distinct systems: the Swartkops Aquifer and the Coega Ridge Aquifer. These are hydrogeologically independent of each other due to the presence of the Coega Fault, a major structural feature separating the two systems.

The Basin was declared a Subterranean Government Water Control Area in 1957 in order to protect the aquifers from over-exploitation and contamination.

The Coega Ridge Aquifer is comprised of the quartz arenites of the Table Mountain Group. It is overlain by a thick layer of impermeable siltstones and mudstones, which act as an aquiclude (an impermeable body of rock that may absorb water slowly but does not transmit it). The aquifer stretches from west of the Uitenhage Springs, westward along the Coega Ridge, to the coast. The Coega Ridge Aquifer is economically significant as the source of groundwater for large-scale abstraction by Uitenhage, Sandfontein, Amanzi Citrus Estates, Coega Kop and Wells Estate (Maclear, 2001).

#### **1.10.1 Depth of Water Table:**

The landowners excavated numerous test pits on the proposed mining area. The pits were dug to a depth of four meters without reaching groundwater.

The depth of the open quarry will not be deeper than four meters. No quarrying will take place below the water table.

#### **1.10.2 Ground Water Quality:**

Water quality in the area is 70-300 mS/m. Groundwater chemistry consists of nitrate (> 10mg/l) and fluoride (< 1.5mg/l).

#### **1.10.3 Ground Water Use:**

No groundwater from the mining area will be used. A sprinkler system will be used. Water will be drawn from the holding dam on the existing mining area. The said holding dam is fed by water drawn from the Amanzi farm dam. The water will from there be pumped into the sprinkler system.



**1.10.4 Boreholes and Springs:**

The farm has one- eight hectare dam and five 0.25 hectare dams. No boreholes will be drilled on the mining area.

**1.10.5 River Diversions:**

No river diversions are required. Also see **paragraph 1.9.6 River Diversions**.



### **1.11 Air Quality:**

According to the Mine Health and Safety Act (Act, 29 of 1996) an employer must maintain a healthy and safe environment that is without risk to the health of employees. As far as reasonably practicable every employer must identify the relevant hazards and assess the related risks to persons, who are not employees, who may be exposed and ensure that persons who are not employees, but who may be directly affected by the activities at the mine are not exposed to any hazards to their health and safety.

From the above is clear that activities, which can cause a negative impact on the surrounding environment, need to be assessed, considered and managed where necessary. Other statutory requirements include:

- Threshold Limit values – ACHIH 1998/1999
- Chemical Substances Regulations – R1179 of 25 August 1995.
- The Air Pollution Prevention Act, Act 45 of 1965
- Guidelines – Department of Environmental Affairs and Tourism – Air Pollution Division.

The only risk identified in this regard is that of excessive dust levels on the mining area caused by hauling, excavating and loading of material, as well as the activities at the crushing and screening plant on the Company's adjacent existing mining area.

The ambient air quality within the area is considered to be fair, with dust originating from gravel roads being the primary source of pollution.

### **1.12 Noise:**

Ambient noise levels in the area are similar to those associated with a rural area. It is recommended that regular noise surveys be conducted to monitor any possible impacts on the surrounding communities.

The proposed mining area is located in a relatively sparsely populated area and the general area is relatively quiet.

### **1.13 Archaeological and Cultural sites:**

No areas or sites of archaeological and/or cultural significance were identified to occur on the area identified for the proposed mining area. The farm has been in the family (land owner referred to below) for many years and according to the owners it is unlikely that any sites of archaeological and/or cultural significance will be found.

### 1.14 *Visual Aspects:*

The proposed site lies on a privately owned farm and is located far from any of the main access routes running through the area. Therefore it is unlikely that the proposed mining area will be visible to the broader public.

**Figures 1.14 Photos**

Picture	Description
	<p>Typical vegetation of the proposed mining area.</p>
	<p>Typical vegetation of the proposed mining area.</p>
	<p>Access roads to proposed mining area already exist.</p>





Rehab on adjacent mine by same mining applicant.



Stockpile and plant (on background) on adjacent mine of same applicant. Same plant will be used to process material from proposed mining area.



## **1.15 Regional Socio-economic Structure:**

### **1.15.1 Population, Size and Distribution:**

The 1994 census indicated a population of 7.1 million for the Eastern Cape. The proposed development area lies within the sub region of the Eastern Cape that extends from the coastal area from Port Alfred to Xhora, with the hinterland up to the Bedford and Cathcart districts. The population of this sub region is 2.3 million with a density of 69.5 people per square kilometre. The sub region is predominantly rural, with 55 percent of the population and 60.6 percent of the rural population is below the age of 30.

### **1.15.2 Human Development Index**

The level of human development in a country or region is measured by people's freedom to choose and act upon their choices. In order to make informed choices, people must have some basic human capacities, and a reasonable range of opportunities. The Human Development Index developed by die United Nations Development Programme (UNDP) uses life expectancy and adult literacy as an indication of people's capacities, while income is used to suggest the opportunities available to them (Erasmus 1996).

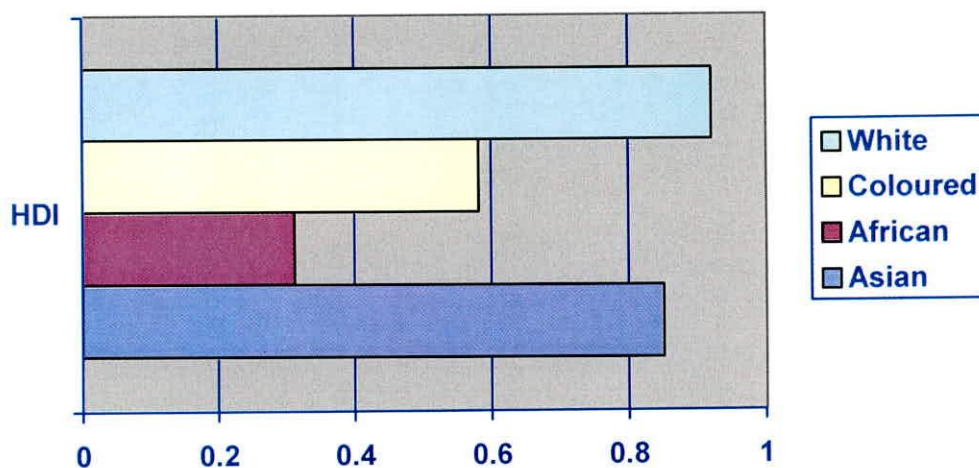
The Human Sciences Research Council calculated the Human Development Index for all population groups in a number of districts. The value of the HDI varies between a maximum of 1, indicating the highest level of human development, and a minimum value of 0. The Eastern Cape's HDI was measured at 0.51 in 1991, an improvement from the 0.42 measured in 1980. This is South Africa's second lowest HDI after the Northern Province and captures the extent of poverty and deprivation in the province. (South African Competitiveness Monitor 1996, Provincial Comparison. WEFA Group In: Tren 1999). As an indication, Human Development levels of 0.90 and above equals the top 25 countries in the world, whereas Rwanda has HDI of 0.33.

The HDI for the various race groups in the Uitenhage district are summarised in Table 1.16.2 below:

**Table 1.16.2: The HDI for Various Race Groups in the Uitenhage District**

<b>Race Group</b>	<b>HDI</b>
<b>Asian</b>	0.85
<b>African</b>	0.31
<b>Coloured</b>	0.58
<b>White</b>	0.92

The following indicates the HDI for the Various Race Groups in the Uitenhage Districts:



### 1.15.3 Housing and Infrastructure

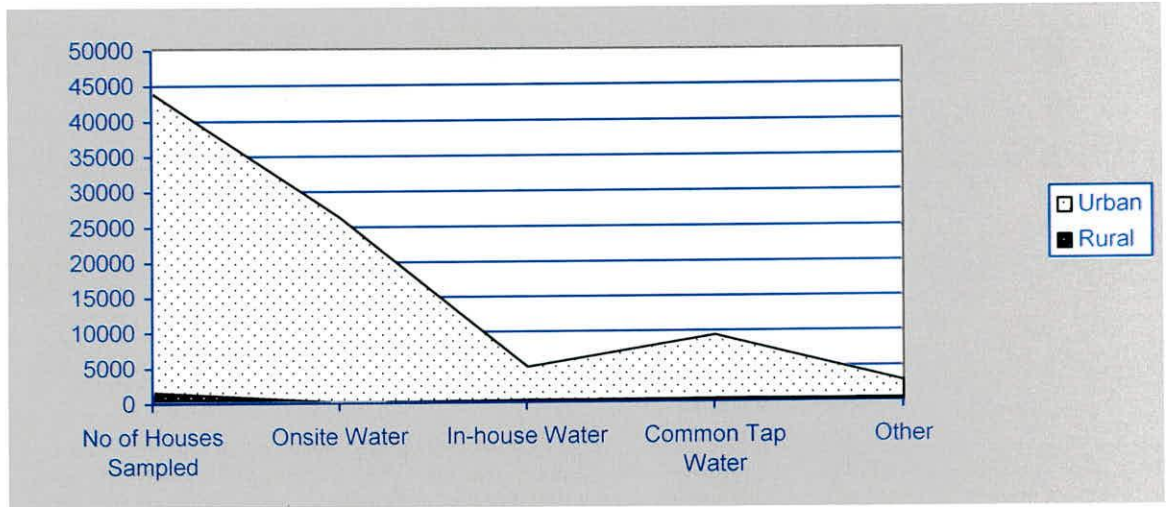
In a survey undertaken in 1993, in a total of 1479 rural houses surveyed in the Uitenhage district, 200 were electrified. And out of the 42349 urban houses surveyed, 32637 were electrified. Table 1.16.3.1 summarises the situation with regard to water access in the Uitenhage district and Table 1.16.1.2 summarises the access to sanitation in houses surveyed in the Uitenhage district.

**Table 1.16.3.1 Water access in the Uitenhage Districts:**

	No of Houses Sampled	Onsite Water	In-house Water	Common Tap Water	Other
Rural	1470	47	317	499	607
Urban	42343	26193	4714	9018	2418



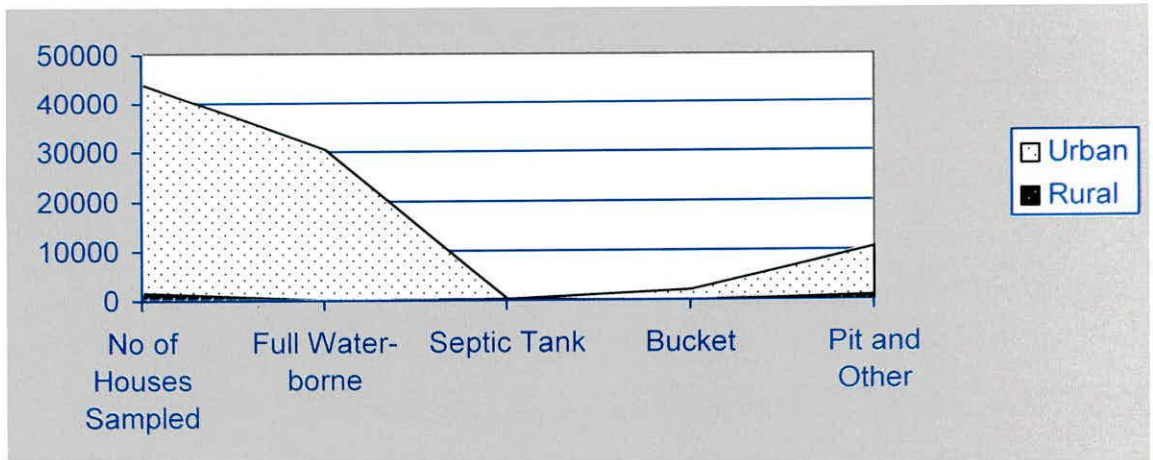
The following indicates the Water access in the Uitenhage Districts:



**Table 1.16.1.2 Sanitation Access in the Uitenhage District:**

	No of Houses Sampled	Full Water-borne	Septic Tank	Bucket	Pit and Other
<b>Rural</b>	1473	0	308	0	1165
<b>Urban</b>	42339	30435	0	2225	9679

The following indicates the Sanitation Access in the Uitenhage District:





## **1.16 LOCAL ECONOMIC DEVELOPMENT PROGRAMME**

The mining area is situated approximately 12 kilometres South-East of Uitenhage. The mine is serviced by the Nelson Mandela Bay Local Municipality. (hereinafter referred to as "the Municipality"). Because of the legacy of apartheid, the district experiences a relatively high level of unemployment.

It is general knowledge that the affects of HIV/AIDS has a devastating impact on the economic activities in a region and although various campaigns, especially directed at the prevention-is-better-than-cure principal, have been run and certain programmes are in place, the issue should be addressed more aggressively in order to reduce the said impact.

Just as Nelson Mandela brought freedom to our nation, Nelson Mandela Bay is a destination that gives you the freedom to choose from an array of world class offerings.

Situated on the South-Eastern coastline of South Africa, Nelson Mandela Bay boasts 40km of magnificent golden beaches washed by the Indian Ocean. With its perfect combination of warm water, breathtaking seashore and protected beaches, it is the perfect value-for-money holiday destination which is confirmed by the many visitors to the Metro.

Nelson Mandela Bay was named after South Africa's former President, humanitarian and icon to the world, Nelson Rolihlahla Mandela, as Madiba was born and spent his formative years in this province.

A popular destination in its own right, Nelson Mandela Bay's well-equipped bustling international airport, harbour and port link it with other national and international destinations, while its national roads allow easy access to the Western Region of the Eastern Cape, including the Sunshine Coast, Frontier Country, Sundays River Valley, Kouga /Tsitsikamma / Garden Route as well as the Karoo Heartland Routes.

Flaunting an atmosphere of relaxed year round-fun, Nelson Mandela Bay is known for its many hours of sunshine, superb weather conditions, temperate climate and exhilarating sea breezes. In addition, Nelson Mandela Bay offers a wide selection of attractions. These include arts and culture, historic heritage, sports & adventure, entertainment and shopping, magnificent wildlife and nature, and limitless water sport action.

Approximately 1.5 million people inhabit the Metro, making it SA's 5<sup>th</sup> largest city in terms of population and the 2<sup>nd</sup> largest in terms of area. The predominant languages are English, Afrikaans and Xhosa. Furthermore, the Metro is a vital centre for the automobile industry and is essentially a transport nucleus.

Port Elizabeth combines the best of all worlds – the economic opportunities and benefits of a large city with its inhabitants' genuine, warm hospitality. This combination of balmy weather plus the range of entertainment options for locals and visitors, account for this coastal city's increasing popularity.



## Tribute to Nelson Mandela



*"I have fought against white domination and I have fought against black domination. I have cherished the idea of a democratic and free society. If need be, it is an ideal for which I am prepared to die". (Nelson Mandela)*

Importantly, the IDP ensures close co-ordination and integration between projects, programmes and activities, both internally (between directorates) and externally, with other spheres of government. The IDP therefore ultimately enhances integrated service delivery and development and promotes sustainable, integrated communities, providing a full basket of services, as communities cannot be developed in a fragmented manner. As the key strategic plan of the Municipality, the IDP priorities inform all financial planning and budgeting undertaken by the institution.

The attainment of IDP and budget targets and deliverables is monitored and evaluated on an ongoing basis. However, this requires that targets and deliverables be credible and realistic. Consequently, the financial plan as well as the performance management system of the Municipality is also outlined in this IDP document.

The Municipality is committed to deliver services within the framework of *Batho Pele* principles, as outlined below:

**a) Courtesy and 'People First'**

Residents should be treated with courtesy and consideration at all times.

**b) Consultation**

Residents should be consulted about service levels and quality, whenever possible.

**c) Service excellence**

Residents must be made aware of what to expect in terms of level and quality of service.

**d) Access**

Residents should have equal access to the services to which they are entitled.

**e) Information**

Residents must receive full and accurate information about their services.

**f) Openness and transparency**

Residents should be informed about government departments, operations, budgets and management structures.

**g) Redress**

Residents are entitled to an apology, explanation and remedial action if the promised standard of service is not delivered.

## h) Value for money

Public services should be provided economically and efficiently.



EXECUTIVE DIRECTOR:  
**Zolile Siswana**  
**ECONOMIC VISION**

The principles of “Global Touch and Local Impact” form the basis upon which the Nelson Mandela Bay’s economic vision is built. Nelson Mandela Bay strives to promote global competitiveness in order to create sustainable livelihood for its inhabitants and address sustainable growth.

### **ECONOMIC OBJECTIVES**

The Nelson Mandela Bay Municipality and its partners are geared to achieve the area’s economic vision by 2020 and accordingly, are committed to the following strategic goals:

- ⬇ To achieve and maintain an economic growth rate of between 3.5% to 8% per annum;
- ⬇ To obtain an annual job growth of 3.5% in order to half the current unemployment;
- ⬇ To reduce by 60% the number of households living below the poverty line; and
- ⬇ Assist SMME’s and co-operatives to access at least 30% of the opportunities in Nelson Mandela Bay.

### **STRUCTURE OF THE DIRECTORATE**

The Economic Development and Recreational Services directorate is responsible for promoting economic growth, job creation and reducing poverty. The directorates work is guided by the area’s Local Economic Development (LED) Plan which provides a blueprint for key development within the area’s growth sectors. The LED Plan also informs targeted development plans which include the Human Resource Development Plan and Investment Strategy, Industrial Strategy.

The directorate aims to ensure that Nelson Mandela Bay is a productive and globally competitive area, which has a vibrant economy, and is able to address local economic challenges. The directorate is structured into different branches, which all work toward developing the economy and spreading its benefits.

- Beaches and resorts**
- Sector development**
- Sport and recreation**
- Tourism, heritage, culture and museums**
- Trade and investment**
- Urban agriculture**



## **BEACHES AND RESORTS**

The Beaches and Resorts sub-directorate aims to maximize the development and usage of all beaches, as well as manage 2 of the 5 resorts owned by the municipality. The directorate's role also involves identifying employment and opportunities along the coastline for Small, Macro and Medium Enterprises (SMME's); encourage the enhancement of the environment, as well as the safety and security of the beach front.

## **SECTOR DEVELOPMENT**

The Sector Development sub-directorate seeks to contribute to the creation of sustainable economic growth that will assist small businesses and cooperatives to develop. The sub-directorate facilitates skills development and mentoring, provides business development support, and also facilitates business linkages and market development initiatives through strategic partnerships in different sectors.

## **SPORT AND RECREATION**

The role of the Sport and Recreation sub-directorate is to maintain, improve and promote the infrastructure of sport facilities in Nelson Mandela Bay. In addition, the sub-directorate aims to integrated local sport and recreation activities in the local tourism agenda, as well as implement sustainable skills development programs essential for the optimal running of the area's sport and recreation activities.

## **TOURISM, CULTURE, HERITAGE AND MUSEUMS**

The Tourism, Culture, Heritage and Museums sub-directorate is responsible for identifying and facilitating infrastructural development necessary for key tourism, cultural and heritage sites in Nelson Mandela Bay. The sub-directorate also provides funding for cultural events and coordinates training programs aimed at capacitating tourism and cultural practitioners.

## **TRADE AND INVESTMENT**

The Trade and Investment sub-directorate aims to position Nelson Mandela Bay as a competitive, world-class business and investment destination by targeting the area's key growth sectors and also by creating an enabling environment for small business and large investments. In partnership with key stakeholders such as the Department of Trade and Industry (DTI), the Eastern Cape Development Corporation (ECDC) and business chambers, the sub-directorate is mainly responsible for the creation of an optimal business climate, attracting new investment, stimulating business expansion and retention in the area, as well as providing business support services.

## URBAN AGRICULTURE

The Urban Agriculture sub-directorate aims to provide infrastructure for commercial and emerging agricultural activities to take place. The sub-directorate's role also involves soliciting training and development for capacity building amongst emerging farmers. In addition, it assists stakeholders in the commercial agriculture and research in the development of products, diversification and value addition through processing.

It is anticipated that at closure, all employees will be absorbed in one or more of the above sectors



### 1.16.1 Effect of HIV/AIDS:

Although the effect of HIV/AIDS is not required to be included into the compilation of this report, it is included as a reference for the management of the facility. The information included is extracted from a technical paper delivered by Dr. Izak Fourie on 28 March 2003 at the 34<sup>th</sup> annual conference of the Institute of Quarrying Southern Africa.

*“At the onset of the 21<sup>st</sup> century post-apartheid South Africa faces daunting economic and social challenges. Most economists and political leaders, regardless of their political orientation, have come to accept that, for South Africa to succeed and meet its social and economic challenges, including the expectations of the majority of its population, it must participate and compete effectively in the global economy.*

*If South African is to (re)join the global economy and kick-start the “African Renaissance”, it will have to attract significant amounts of foreign direct investment while its private, formal sector companies must cut costs, increase productivity and improve quality standards.*

*Sadly, just as the opportunities of the global economy are opening up to South Africa, the country is facing an HIV/AIDS epidemic of considerable proportions. Although the country’s health care systems will bear (and is already bearing) the initial brunt of the epidemic, there is no doubt that HIV/AIDS will affect virtually every aspect of our society, including our companies and workplace to the extent that it may threaten the very survival of some of our private sector enterprises.”*

*“In its latest Global Update, the Joint United Nations Program on HIV/AIDS (UNAIDS) provide the following estimates of the global HIV/AIDS epidemic as at December 2001:*

- *People newly infected with HIV in 2001:5 million*
- *Number of people living with HIV/AIDS:40 million*
- *AIDS deaths in 2001 :3 million*
- *Cumulative AIDS deaths (since 1980) :24 million*

*Sub-Saharan Africa continues to dwarf the rest of the world on the HIV/AIDS scorecard with 3.4 million of the total of 5 million new infections in 2001 occurring on our continent. Similarly, of the 40 million people living with HIV/AIDS, 28.1 million or 70.2% are from sub-Saharan Africa.*

*While no country in sub-Saharan Africa has escaped to virus, some are far more severely affected than others. According to the latest UNAIDS report, the bulk of new infections continue to be concentrated in East and especially Southern Africa.*

The following table indicates the progression of HIV/AIDS and the economical impacts associated with each progression.

<b>Year</b>	<b>Progression of HIV/AIDS</b>	<b>Economic Impact</b>
0	Infection occurs	-No cost
0-5	Incubation period	-Little or no costs
6-7	HIV/AIDS-related morbidity begins	-Increased sick leave and absenteeism -Reduced productivity -Increased medical costs -Employee requires attention from occupational health, supervisory, human resource and employee assistance personnel
8-10	Employment terminated due to resignation, medical incapacity or death	-Death and/or disability claims -Retirement benefits claims by employee or dependants -Increased medical costs continues post-employment for employees on medical schemes -Company-sponsored loans not repaid -Funeral expenses -Compassionate leave for co-employees to attend funeral -Negative effect on morale and productivity of co-employees -Costs of keeping employee on payroll until medical separation procedures have been completed
8-10	Company recruits and retrain a replacement employee	-Cost of temporary staff or overtime until new employee is operational -Cost of recruitment, training and induction -Salary during training/induction period -Initial lower productivity -Time spent by other employee on in-service training

**Table 1.16.1 .Economic impacts of HIV/AIDS**

It is important for all personnel manager to take note of the possible implications of the disease on his workforce. Ay employer must also realise that a certain responsibility towards employees must be accepted. .



## **1.17 Sensitive Environmental Features:**

### **1.17.1 Features Requiring Protection:**

There are no environmental features identified on the mining area that require protection.

### **1.17.2 Features Requiring Remediation:**

There are no environmental features identified on the mining area that require remediation.

### **1.17.3 Features Requiring Management:**

The following environmental features identified as sensitive, will require specific management measures:

- Surface Water (quality monitoring).
- Air Quality (dust fallout monitoring).
- Noise Pollution (noise levels monitoring).

### **1.17.4 Features Requiring Avoidance:**

There are no environmental features identified on the mining area that require avoidance.

### **1.17.5 End Land Use Objectives:**

The end land use for the mining area can be used for grazing.

## **Chapter 2 – Project Description:**

*MPRDA Section 39 (3)(b)(i)*

*MPRDA Section 39 (3)(d)(i)*

### **2.1 Surface infrastructure:**

#### **2.1.1 Roads, Railways and Power Lines:**

See **Map 1 – Regulation 2(2) Plan** and **Map 3 – Locality Plan** attached hereto as **Annexure A**. No railway or power line passes through or nearby the application area.

#### **2.1.2 Industrial and Domestic Waste Disposal Sites:**

Domestic waste will be disposed of in suitable covered receptacles on the application area.

All used oils, grease or hydraulic fluids shall be placed in suitable covered receptacles and will be removed from the site on a regular basis for disposal at a registered or licensed disposal site.

#### **2.1.3 Water Pollution Management Facilities:**

No sewage plant will be erected on the proposed mining area. Portable toilets will be used and will be cleaned once a week.

- **Pollution Control Structures:**

No pollution control structures will be erected on the application area.

- **Polluted Water Treatment Facility:**

No polluted water treatment facility will be erected on the application area.

#### **2.1.4 Potable Water Plant:**

No potable water plant will be erected on the application area. Potable water will be obtained from the said adjacent (existing) Amanzi mine.

#### **2.1.5 Process Water Supply System:**

No processing of material (sand and stone) will be done on the application area. All processing will be done at the said adjacent (existing) Amanzi mine and no processing supply system will be necessary.

#### **2.1.6 Quarry Pit:**

The existing quarry pit from the adjacent (existing) Inzulu mine will be extended from the east into the application area in the form of opencast mining.



**2.1.7 Mine Residue Disposal Sites:**

No mine residue will be disposed of on the application area. Overburden will be stored on the existing stockpiles at the said adjacent (existing) Inzulu mine.

**2.1.8 Topsoil Storage Stockpiles:**

Any available topsoil will be stored on topsoil stockpile dumps. These dumps will not be higher than 2 meters and will be vegetated to prevent erosion and the loss of topsoil.

**2.1.9 Mineral Stockpiles:**

No Mineral stockpiles will be present on the application area. All mineral stockpiles will be at the said adjacent (existing) Amanzi mine.

**2.1.10 Mineral Processing Plant:**

No Processing plants will be erected on the application area. All processing will be done at the said adjacent (existing) Amanzi mine.

**2.1.11 Workshops and Administration Buildings:**

The existing infrastructure at the said Amanzi mine will be utilised.

**2.1.12 Housing and Recreational Facilities:**

No housing or recreational facilities will be erected on the application area.

**2.1.13 Transport**

The existing road network will be used. No new road is required on the site or to transport the product from the site. Dumper trucks will be used to transport the material to the adjacent (existing) Amanzi mine.

**2.2 General Description:****2.2.1 Description of the mining methods:**

The open cast mining method, namely bench mining, is being practised for the extraction of the sand and stone. The overburden and top soil are stockpiled separately and are being utilised for rehabilitation purposes. The material is extracted with an excavator after which it is removed by dumper trucks. The material is screened and after the sand and stone are separated, the sand is sold and the stone is crushed at the crushing plant. Both the crushing plant and sand screen are situated on the adjacent existing mining area.

In the process below the method will be explained precisely:

**The Basic Working of Amanzi Quarry Photos and Labels:**

## Sand Screen and Stone Crusher



- 1 Front End Loader digs up material in the pit, and transports it to the Sand Screen Primary Bin.
- 2 Material is fed out of the Primary Bin onto the conveyor system.
- 3 Material is raised on this conveyor, and then falls onto the screening deck.
- 4 Material is sieved, and sized on the screening deck
- 5 Sand falls through the screens, because it is the finest, and is stockpiled ready for loading.
- 6 Stones which are too large to pass through the first sieve, fall down the chute, and onto the stone stockpiling conveyors.
- 7 Stone Stockpiling Conveyors transport material to the stone stockpile, thereby saving diesel.
- 8 Stone is stockpiled in close vicinity to the Stone Crusher.
- 9 Another Front End Loader loads material into the Jaw Crusher or the Primary Crusher.
- 10 Stone is crushed by the Primary Crusher and then again by the Secondary Crusher.
- 11 Stone is screened and sized, oversize id fed back to the secondary crusher.  
There are 3 stockpiling conveyors, each one conveying a different size material.
- 12 13mm Stone Stockpile
- 13 Coarse Grit/Crusher Run Stockpile
- 14 19mm Stone Stockpile
- 15 Truck Loading Area
- 16 Rehabilitated Area



## Topsoil clearing

- 1 Topsoil is stockpiled
- 2 Bulldozer separates topsoil and subsoil
- 3 Usable material, which has been excavated, and will be screened.
- 4 Rehabilitated area.
- 5 Screening Plant.

It can be seen that the rehabilitated area is at a lower level than the area to be mined.

All topsoil is preserved for future use in rehabilitation.



## 2.2.2 Forecast of annual production rates:

The planned optimal (Maximum) production rate is 60,000m<sup>3</sup> per annum of sand and 96,000 tons of stone.

The following tables detail the quantities mined since the inception of the adjacent mine in June 2004 and by using the past figures in conjunction with the increased market demand and future growth of the quarry, they have been forecast up to 2019. The red figures are for future predictions.

Inzulu Quarry - Total Sand Sales per month in m <sup>3</sup>			Inzulu Quarry - Total Stone Sales per month in tons		
Month/Year	Total Sand	Increase	Month/Year	Total Stone	Increase
Jun-04	1335		Jun-04		
Jul-04	4402.5		Jul-04		
Aug-04	3500		Aug-04		
Sep-04	3248		Sep-04		
Oct-04	5638		Oct-04		
Nov-04	5429.5		Nov-04		
Dec-04	1679		Dec-04		
Jan-05	2055		Jan-05		
Feb-05	2414		Feb-05		
Mar-05	3391		Mar-05		
Apr-05	2416		Apr-05		
May-05	2369		May-05		
Jun-05	2586	94%	Jun-05		
Jul-05	2781	-37%	Jul-05		
Aug-05	1949.5	-44%	Aug-05		
Sep-05	3071.5	-5%	Sep-05		
Oct-05	2103.5	-63%	Oct-05		
Nov-05	2114.7	-61%	Nov-05		
Dec-05	925	-45%	Dec-05	268.975	
Jan-06	1237	-40%	Jan-06	1270.2	
Feb-06	1510.5	-37%	Feb-06	2054.65	
Mar-06	2271.5	-33%	Mar-06	2190.95	
Apr-06	2286.8	-5%	Apr-06	1380.4	
May-06	1771.5	-25%	May-06	2010.54	
Jun-06	2496.5	-3%	Jun-06	2442.87	
Jul-06	2661	-4%	Jul-06	2545.02	
Aug-06	3239	66%	Aug-06	2538.28	
Sep-06	2202.5	-28%	Sep-06	2885	
Oct-06	2719.5	29%	Oct-06	3017.34	
Nov-06	2445.9	16%	Nov-06	3464.6	
Dec-06	850	-8%	Dec-06	1933.4	619%
Jan-07	820	-34%	Jan-07	2617.28	106%
Feb-07	2273.5	51%	Feb-07	3233.43	57%
Mar-07	3141.5	38%	Mar-07	4489.33	105%
Apr-07	2323.5	2%	Apr-07	4363.42	216%
May-07	3284.5	85%	May-07	4909.04	144%
Jun-07	1739.5	-30%	Jun-07	5588.86	129%
Jul-07	1020.5	-62%	Jul-07	6026.17	137%
Aug-07	993.5	-69%	Aug-07	5324.34	110%
Sep-07	2004.5	-9%	Sep-07	4721.56	64%
Oct-07	2027.5	-25%	Oct-07	6415.54	113%
Nov-07	2614.5	7%	Nov-07	5446.66	57%

Inzulu Quarry - Total Sales Sand and Stone per annum (March to Feb)				
Year	Total Sand	Ave/month	Total Stone	Ave/month
2005	29701	3300.11	0	
2006	26454.7	2204.56	3593.825	1197.94
2007	26037.7	2169.81	30259.11	2521.59
2008	24983.6	2081.97	58003.2	4833.60
2009	30906.17	2575.51	70128.88	5844.07
2010	33378.66	2781.56	75739.19	6311.60
2011	36048.96	3004.08	81798.33	6816.53
2012	38932.87	3244.41	88342.19	7361.85
2013	42047.50	3503.96	95409.57	7950.80
2014	45411.30	3784.28	103042.33	8586.86
2015	49044.21	4087.02	111285.72	9273.81
2016	52967.74	4413.98	120188.58	10015.71
2017	57205.16	4767.10	129803.66	10816.97
2018	61781.58	5148.46	140187.96	11682.33
2019	66724.10	5560.34	151402.99	12616.92



Dec-07	2034	139%	Dec-07	2164.06	12%
Jan-08	1453.5	77%	Jan-08	3818.22	46%
Feb-08	2346.6	3%	Feb-08	4736.00	46%
Mar-08	895	-72%	Mar-08	3457.34	-23%
Apr-08	1325	-43%	Apr-08	5079.91	16%
May-08	1490	-55%	May-08	4858.33	-1%
Jun-08	1554	-11%	Jun-08	3998.14	-28%
Jul-08	2536.9	149%	Jul-08	5837.46	-3%
Aug-08	2349.22	136%	Aug-08	4519.38	-15%
Sep-08	2456.42	23%	Sep-08	6456.19	37%
Oct-08	2505.05	24%	Oct-08	9924.33	55%
Nov-08	3751.5	43%	Nov-08	7188.15	32%
Dec-08	4326.5	113%	Dec-08	5008.23	131%
Jan-09	3567.08	145%	Jan-09	6335.21	66%
Feb-09	4149.5	77%	Feb-09	7466.21	58%
Mar-09	966.60	8%	Mar-09	3733.93	8%
Apr-09	1431.00	8%	Apr-09	5486.30	8%
May-09	1609.20	8%	May-09	5247.00	8%
Jun-09	1678.32	8%	Jun-09	4317.99	8%
Jul-09	2739.85	8%	Jul-09	6304.46	8%
Aug-09	2537.16	8%	Aug-09	4880.93	8%
Sep-09	2652.93	8%	Sep-09	6972.69	8%
Oct-09	2705.45	8%	Oct-09	10718.28	8%
Nov-09	4051.62	8%	Nov-09	7763.20	8%
Dec-09	4672.62	8%	Dec-09	5408.89	8%
Jan-10	3852.45	8%	Jan-10	6842.03	8%
Feb-10	4481.46	8%	Feb-10	8063.51	8%
Mar-10	1043.93	8%	Mar-10	4032.64	8%
Apr-10	1545.48	8%	Apr-10	5925.21	8%
May-10	1737.94	8%	May-10	5666.76	8%
Jun-10	1812.59	8%	Jun-10	4663.43	8%
Jul-10	2959.04	8%	Jul-10	6808.81	8%
Aug-10	2740.13	8%	Aug-10	5271.40	8%
Sep-10	2865.17	8%	Sep-10	7530.50	8%
Oct-10	2921.89	8%	Oct-10	11575.74	8%
Nov-10	4375.75	8%	Nov-10	8384.26	8%
Dec-10	5046.43	8%	Dec-10	5841.60	8%
Jan-11	4160.64	8%	Jan-11	7389.39	8%
Feb-11	4839.98	8%	Feb-11	8708.59	8%
Mar-11	1127.44	8%	Mar-10	4355.25	8%
Apr-11	1669.12	8%	Apr-10	6399.22	8%
May-11	1876.97	8%	May-10	6120.10	8%
Jun-11	1957.59	8%	Jun-10	5036.50	8%
Jul-11	3195.76	8%	Jul-10	7353.52	8%
Aug-11	2959.34	8%	Aug-10	5693.12	8%
Sep-11	3094.38	8%	Sep-10	8132.94	8%
Oct-11	3155.64	8%	Oct-10	12501.80	8%
Nov-11	4725.81	8%	Nov-10	9055.00	8%
Dec-11	5450.14	8%	Dec-10	6308.93	8%
Jan-12	4493.49	8%	Jan-11	7980.54	8%
Feb-12	5227.17	8%	Feb-11	9405.27	8%
Mar-12	1217.64	8%	Mar-10	4703.67	8%
Apr-12	1802.65	8%	Apr-10	6911.16	8%
May-12	2027.13	8%	May-10	6609.70	8%
Jun-12	2114.20	8%	Jun-10	5439.43	8%
Jul-12	3451.42	8%	Jul-10	7941.80	8%
Aug-12	3196.09	8%	Aug-10	6148.57	8%
Sep-12	3341.93	8%	Sep-10	8783.58	8%
Oct-12	3408.09	8%	Oct-10	13501.94	8%
Nov-12	5103.87	8%	Nov-10	9779.40	8%
Dec-12	5886.16	8%	Dec-10	6813.64	8%



Jan-13	4852.97	8%	Jan-11	8618.98	8%
Feb-13	5645.35	8%	Feb-11	10157.70	8%
Mar-13	1315.05	8%	Mar-10	5079.97	8%
Apr-13	1946.86	8%	Apr-10	7464.05	8%
May-13	2189.30	8%	May-10	7138.48	8%
Jun-13	2283.34	8%	Jun-10	5874.58	8%
Jul-13	3727.54	8%	Jul-10	8577.14	8%
Aug-13	3451.77	8%	Aug-10	6640.45	8%
Sep-13	3609.29	8%	Sep-10	9486.26	8%
Oct-13	3680.74	8%	Oct-10	14582.10	8%
Nov-13	5512.18	8%	Nov-10	10561.75	8%
Dec-13	6357.05	8%	Dec-10	7358.73	8%
Jan-14	5241.21	8%	Jan-11	9308.50	8%
Feb-14	6096.98	8%	Feb-11	10970.31	8%
Mar-14	1420.25	8%	Mar-10	5486.36	8%
Apr-14	2102.61	8%	Apr-10	8061.18	8%
May-14	2364.44	8%	May-10	7709.56	8%
Jun-14	2466.00	8%	Jun-10	6344.55	8%
Jul-14	4025.74	8%	Jul-10	9263.32	8%
Aug-14	3727.92	8%	Aug-10	7171.69	8%
Sep-14	3898.03	8%	Sep-10	10245.16	8%
Oct-14	3975.20	8%	Oct-10	15748.66	8%
Nov-14	5953.16	8%	Nov-10	11406.69	8%
Dec-14	6865.61	8%	Dec-10	7947.43	8%
Jan-15	5660.51	8%	Jan-11	10053.18	8%
Feb-15	6584.74	8%	Feb-11	11847.94	8%
Mar-15	1533.87	8%	Mar-10	5925.27	8%
Apr-15	2270.82	8%	Apr-10	8706.07	8%
May-15	2553.60	8%	May-10	8326.32	8%
Jun-15	2663.28	8%	Jun-10	6852.11	8%
Jul-15	4347.80	8%	Jul-10	10004.38	8%
Aug-15	4026.15	8%	Aug-10	7745.42	8%
Sep-15	4209.87	8%	Sep-10	11064.78	8%
Oct-15	4293.22	8%	Oct-10	17008.56	8%
Nov-15	6429.41	8%	Nov-10	12319.23	8%
Dec-15	7414.86	8%	Dec-10	8583.23	8%
Jan-16	6113.35	8%	Jan-11	10857.44	8%
Feb-16	7111.51	8%	Feb-11	12795.77	8%
Mar-16	1656.58	8%	Mar-10	6399.30	8%
Apr-16	2452.48	8%	Apr-10	9402.56	8%
May-16	2757.89	8%	May-10	8992.43	8%
Jun-16	2876.35	8%	Jun-10	7400.28	8%
Jul-16	4695.62	8%	Jul-10	10804.73	8%
Aug-16	4348.24	8%	Aug-10	8365.06	8%
Sep-16	4546.66	8%	Sep-10	11949.96	8%
Oct-16	4636.67	8%	Oct-10	18369.24	8%
Nov-16	6943.76	8%	Nov-10	13304.76	8%
Dec-16	8008.05	8%	Dec-10	9269.88	8%
Jan-17	6602.42	8%	Jan-11	11726.03	8%
Feb-17	7680.43	8%	Feb-11	13819.43	8%
Mar-17	1789.11	8%	Mar-10	6911.24	8%
Apr-17	2648.68	8%	Apr-10	10154.76	8%
May-17	2978.52	8%	May-10	9711.82	8%
Jun-17	3106.45	8%	Jun-10	7992.30	8%
Jul-17	5071.27	8%	Jul-10	11669.11	8%
Aug-17	4696.10	8%	Aug-10	9034.26	8%
Sep-17	4910.39	8%	Sep-10	12905.95	8%
Oct-17	5007.61	8%	Oct-10	19838.78	8%
Nov-17	7499.27	8%	Nov-10	14369.15	8%
Dec-17	8648.69	8%	Dec-10	10011.47	8%
Jan-18	7130.61	8%	Jan-11	12664.11	8%



Feb-18	8294.87	8%	Feb-11	14924.99	8%
Mar-18	1932.24	8%	Mar-10	7464.14	8%
Apr-18	2860.58	8%	Apr-10	10967.14	8%
May-18	3216.80	8%	May-10	10488.77	8%
Jun-18	3354.97	8%	Jun-10	8631.68	8%
Jul-18	5476.98	8%	Jul-10	12602.64	8%
Aug-18	5071.79	8%	Aug-10	9757.00	8%
Sep-18	5303.23	8%	Sep-10	13938.43	8%
Oct-18	5408.22	8%	Oct-10	21425.88	8%
Nov-18	8099.21	8%	Nov-10	15518.68	8%
Dec-18	9340.59	8%	Dec-10	10812.39	8%
Jan-19	7701.06	8%	Jan-11	13677.24	8%
Feb-19	8958.46	8%	Feb-11	16118.99	8%

The mining area is 82 hectares in extent, which converts to 2296000 m<sup>3</sup> of stone, which makes out 70% of the reserve. The remaining 30% reserve which is 984000 m<sup>3</sup> of sand, will be separated on the screen and sold separately. The life of mine is estimated to be 35 years for stone and 16 years for sand at the current rate of production. (60 000 m<sup>3</sup> per annum for sand) (96 000tons per annum for stone)

### 2.2.3 Infrastructure:

No infrastructure will be erected on the application area. The existing infrastructure at the adjacent (existing) Amanzi mine will be used.

## 2.3 Mining Activities:

**Table 2.3 Mining Phases and Activities**

Phase:	Activity:	Description:
Construction Phase:	Due to the fact that no infrastructure will be established on the mining area, there will be no construction phase.	
Operational Phase:	Topsoil Removal	<p>When topsoil is removed and stored, it will be done according to the Soil Utilisation Guide below.</p> <p><b>Soil Utilisation Guide:</b></p> <p>The following design parameters will be taken into account when designing the topsoil stockpiles:</p> <ul style="list-style-type: none"> <li>-Topsoil will be removed to a depth of 300mm.</li> <li>-The stockpiles must be constructed on the most gradual slope possible.</li> <li>-The slope of the stockpile material must be kept as low and possible to avoid extensive erosion of the natural resource.</li> <li>-If erosion does occur the stockpiles can be stabilised through re-vegetation with pioneering grass species. Species include <i>Eragrostis curvula</i> and <i>Melinis repens</i>.</li> <li>-Soil fertility needs to be assessed and ameliorated where necessary prior to re-vegetation in order to ensure optimal growth.</li> </ul>
Operational Phase:	Excavating	Sand and stone mining will be conducted with an excavator as with general opencast mining methods. Sand and stone will be loaded directly onto dumper trucks and transported to the adjacent Amanzi mine for processing.
Operational Phase:	Hauling	Sand and stone are hauled via dumper trucks from the quarry pit and excavation area to the processing plants at the adjacent Amanzi mine.
Operational Phase:	Backfilling	The mined out areas of the quarry pit will be backfilled on



		a continuous basis using the overburden material.
<b>Operational Phase:</b>	Levelling and Sloping	Mined out areas are levelled and sloped to an angle of 1:3 or flatter where possible.
<b>Operational Phase:</b>	Replacing topsoil	After the mined out areas are levelled and sloped, any available stockpiled topsoil will be replaced and levelled over the areas.
<b>Operational Phase:</b>	Vegetating	After topsoil is returned to the levelled and sloped, mined-out areas, a grass seed mixture including <i>Eragrostis spp</i> and any other endemic species found surrounding the area will be sown.
<b>Operational Phase:</b>	Dust Suppression	<p>Approximately 5,000 litres of water will be sprayed onto the roads daily for dust suppression purposed, but is only expected to be required during the drier seasons of the year. This water will partly evaporate and partly drain into the soils.</p> <p>Water for dust suppression will be obtained from the said holding dam on the existing mining area.</p>
<b>Closure Phase</b>	Final Replacing of Topsoil	Once mining is ceased, the stockpiled overburden will be backfilled into the mined-out pit. After final backfilling is completed, all material will be left at a slope of at least 1:3
<b>Closure Phase</b>	Final Backfilling and Sloping	After final levelling and sloping, any remaining available topsoil will be replaced over any remaining un-rehabilitated areas.
<b>Closure Phase</b>	Final Vegetating	A grass seed mixture including <i>Eragrostis spp</i> and any other endemic species found surrounding the area will be sown on all areas where vegetation growth has not established successfully.
<b>Closure Phase</b>	Dust Suppression	While rehabilitation activities are in progress, water will be sprayed onto the roads and

		uncovered areas for dust suppression purposes. This water will partly evaporate and partly drain into the soils.
<b>Post-Closure Phase</b>	Erosion Control	For a period of at least two years after final rehabilitation, the area will be monitored for occurrence of erosion. Any newly eroded areas found will be remediated
<b>Post-Closure Phase</b>	Vegetation monitoring	Vegetation will be monitored for a period of at least two years after final rehabilitation. Any area where the vegetation cover is insufficient will be re-vegetated with a similar seed mixture as above.



## Chapter 3 – Environmental Impacts Assessment:

MPRDA Regulation 49 (1)(c)

### 3.1 Engagement Process with affected parties:

The following steps have been taken to ensure that all affected parties were given the opportunity to raise their concerns, if any:

- A site notice has been placed at the entrance to the application area and other strategic points. The notices have been placed in such a way as to ensure that they are clear and visible.
- An advertisement has been placed in the local newspaper (namely “Your Local Newspaper”), notifying people from the surrounding communities of the mining right application and providing them with the opportunity to raise their concerns or to obtain more information.
- The identified affected parties were personally briefed by management of the Company and each of them filled out and signed a *pro forma* confirmation of consultation and statement (addressed tot the DME) to the effect that they have no concern of any objection against the proposal.

The following affected parties were identified and the **results of consultation with same, as well as the said site notice and actual newspaper clipping** are attached as **Annexure B** hereto:

- |                                       |                    |
|---------------------------------------|--------------------|
| • The Nelson Mandela Bay Municipality | (local authority). |
| • Amanzi Estate (Pty) Ltd             | (land owner).      |
| • H Stumke                            | (neighbour).       |
| • M G Ranger                          | (neighbour).       |
| • Kings Crest Housing Development     | (developer).       |
| • PPC Cement                          | (affected party).  |

It should be mentioned that it would appear as if PPC on its own initiative consulted Messrs **Nu-Way Housing Development** and its comments are also attached in the said **Annexure B – please also refer to the colour copy attached to the letter for interpretation purposes. It is not sure what its *modus operandi/locus standi/capacity in the matter is***. The aforementioned comments are self explanatory. *In this regard it could be mentioned that according to a telephonic conversation between the author of the letter, namely Mr Jordan Mann and MR André Richter of Future Mining Consultants, it was concerned regarding the possible reduction in the value of properties within a development area in the vicinity of the mine as a result of restrictive conditions of title concerning dust pollution and noise as result of mining and activities incidental thereto being imposed on the development by the DME – although no mention of this is made in the said letter.* Although the said comments were received at a very late stage, the comments are to a certain extent entertained in this document.

### 3.2 Potential Environment Impacts Identified by affected parties:

It should be understood that although the land owner and the Company are not the same legal person, they have almost the same shareholders and directors, which means that they are, except for the BEE component, family businesses. As explained above, none of the identified affected parties had any concerns or objections against the proposal.

The said comments of Nu-Way Housing Developments in short refer to a report drafted by Environmental Consultants SRK (Steffen, Robertson and Kirsten) for the said Nelson Mandela Bay Local Municipality, indicates that approximately one third of the proposed mining area (please refer to the said colour map) falls within the high bio diversity zone and it is stated that the entire mining area is undisturbed. Apart from the high bio diversity areas, there are also on the legends of the said map mention made of areas that have been proclaimed to be protected area and other areas that have been identified for protection that have not been proclaimed protected yet. These obviously fall outside the map. Apart from expressing its concern and objection to the proposal, Nu-Way requests that the guidelines proposed by SRK in regard to the identified high biodiversity zone be adhered to – which are listed in the said letter.

The Company and Future Mining Consultants find this surprising as any person who conducts an *in loco* inspection of the particular site who is not remotely familiar with environmental management, would realise that, although the vegetation has not been cleared, it is not in its historic original state due to former agricultural use (grazing) and that it is extremely invested with alien vegetation – please refer to the fauna and flora sections above. As mentioned in the surface water subsection above, the area close to the said Coega River is however known for high biodiversity, which have specifically been left out of the proposed mining area – 50 metre buffer zone from said river. The legal status of the said guidelines as to be imposed on this application is therefore questioned, especially as the said municipality had no objection and the land owner would have to be consulted if such a zone was to be proclaimed a no go area, for instance. *The said comments have therefore for the purpose of impacts and mitigation measures further in this document not been taken into account and wherever mentioned is made of same by affected parties, it will be indicated as being “none”.*

No potential environmental impacts were identified by any other affected parties.



**3.3 Potential Environmental Impacts Identified by State Departments:**

No such impacts are as yet identified by State Departments.

**3.4 Potential Environmental Impacts of the Mining Activities:**

The following table indicates the possible impacts that may occur from the mining activities

**Table 3.4.1 Possible Construction Phase Impacts**

<b>Construction Phase:</b>					
<b>Activity:</b>	<b>Environmental Aspect:</b>	<b>Impact</b>	<b>Mitigation Impact</b>	<b>Annual Cost</b>	<b>Final Cost (Calculated over a period of 30 years in accordance with the life of mine)</b>
Due to the fact that the existing infrastructure at the adjacent Amanzi mine will be used, no construction phase will take place.					



Table 3.4.2 Possible Operational Phase Impacts

Operational Phase:					
Activity:	Environmental Aspect:	Impact	Mitigation Impact	Annual Cost	Final Cost (Calculated over a period of 30 years in accordance with the life of mine)
Topsoil Removal:	<b>Geology:</b>	Due to the fact that the topsoil only consists of 300mm: the geology will not be affected.	No mitigation is needed for this aspect due to the fact that there is no impact on same.	R0-00	R0-00
	<b>Topography:</b>	The removal of topsoil will create a lowered topography.	The negative impact on the topography of the mining site will be addressed during backfilling.	R0-00	R0-00
	<b>Soil:</b>	Topsoil will be removed periodically as required over the life of mine. The topsoil will be stockpiled.	The following design parameters will be taken into account when designing the topsoil stockpiles: <ul style="list-style-type: none"> <li>• Topsoil will be removed up to a depth of 300mm or the available depth.</li> <li>• The stockpiles must be constructed on the most gradual slope possible and limited to a height of no more than 2m.</li> <li>• The slope of the stockpile material must be kept as low as possible to avoid extensive erosion of the natural resource.</li> <li>• The stockpiles must be vegetated when stored for a period longer than six months.</li> <li>• If erosion does occur the stockpiles can be stabilized through re-vegetation with pioneering grass species. Species include <i>Eragrostis curvula</i> and <i>Melinis repens</i>.</li> <li>• Soil fertility need to be assessed and</li> </ul>	R10,000-00	R300,000-00

		ameliorated where necessary prior to re-vegetation in order to ensure optimal growth.		
<b>Flora:</b>	The vegetation will be removed periodically as the mine do rehabilitation as the same time as mining.	Spreading topsoil over the disturbed areas during the closure phase, and then seeding the areas with an endemic seed mixture address the impact on vegetation. It is recommended that six monthly monitoring sessions be undertaken after the topsoil was restored to assess the success of the re-vegetation. During these monitoring sessions additional measures such as fertilisation can be implemented if necessary.	R0-00 The cost is included in the previous aspect namely topsoil removal.	R0-00 The cost is included in the previous aspect namely topsoil removal.
<b>Fauna:</b>	Fauna will leave the area temporarily.	After the rehabilitation of the mining area and successful re-vegetation, the displaced animal life will return in the time to come. It is however recommended that the mine manager needs to make it clear to labourers not to hunt or trap the local fauna especially the smaller mammals.	R0-00	R0-00
<b>Surface Hydrology:</b>	The lowered topography will alter the surface water runoff patterns.	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of beams and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.	R8,000-00	R24,000-00
<b>Groundwater:</b>	The mining activities will not intersect the groundwater table and no bore holes will be drilled on site. Water will be drawn from the holding dam on the existing mining area. The said holding dam is fed by water drawn form the	No mitigation measures are required	R0-00	R0-00



	Amanzi farm dam. The water will from there be pumped into the sprinkler system. The processing will be conducted on the existing site and water for this purpose will also be drawn from the said holding dam.				
<b>Air Quality / Dust suppression:</b>	An increase in dust levels due to vehicle movement and excavation.	<p>The following steps will be taken:</p> <ul style="list-style-type: none"> <li>• A sprinkler system will be used. Water will be drawn from the holding dam on the existing mining area. The said holding dam is fed by water drawn from the Amanzi farm dam. The water will from there be pumped into the sprinkler system.</li> <li>• Periodic watering of the access roads will be conducted if and when required, especially in August and September before the raining season commence.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>	R32,000-00	R960,000-00	
<b>Noise:</b>	Vehicles and machinery will cause an increase in the noise levels.	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.	Already catered for in the cash flow forecast contained in the Mining Work Programme. R960,000-00	Already catered for in the cash flow forecast contained in the Mining Work Programme. R28,800,000 - 00	
<b>Visual Aspects:</b>	There is no visual impact as the mining site is not visible from any roads.	No mitigation measures required.	R0-00	R0-00	
<b>Excavating:</b>	<b>Geology:</b>	The upper part of the	The mine will be committed to optimise the use	R0-00	R0-00

	geological structure is removed through excavating. The underlying geology will however not be affected.	of the mined mineral in order to ensure no resources are wasted. No other management measures will be possible.		
<b>Topography:</b>	Excavating will create a lowered topography and leave a final void.	The negative impact on the topography of the mining site will be addressed during backfilling.	R10,000-00	R300,000-00
<b>Soil:</b>	The underlying soil structure (overburden) is removed and stockpiled.	The impacts of excavating soil will be addressed during the Replacing Topsoil activities.	R10,000-00	R300,000-00
<b>Flora:</b>	All Flora has already been removed.	No mitigation measures required.	R0-00	R0-00
<b>Fauna:</b>	All Fauna has already vacated the site in the previous phase.	No mitigation measures required.	R0-00	R0-00
<b>Surface Hydrology:</b>	The lowered topography and final void will alter the surface water runoff patterns.	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of beams and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.	R0-00 Cost already included in previous phase.	R0-00 Cost already included in previous phase.
<b>Groundwater:</b>	The mining activities will not intersect the groundwater table and no bore holes will be drilled on site. Water will be drawn from the holding dam on the existing mining area. The said holding dam is fed by water drawn from the Amanzi farm dam. The water will from there be pumped into the sprinkler	No mitigation measures are required	R0-00	R0-00



	system. The processing will be conducted on the existing site and water for this purpose will also be drawn from the said holding dam.			
<b>Air Quality / Dust suppression:</b>	An increase in dust levels due to vehicle movement and excavation.	<p>The following steps will be taken:</p> <ul style="list-style-type: none"> <li>• A sprinkler system will be used. Water will be drawn from the holding dam on the existing mining area. The said holding dam is fed by water drawn from the Amanzi farm dam. The water will from there be pumped into the sprinkler system.</li> <li>• Periodic watering of the access roads will be conducted if and when required, especially in August and September before the raining season commence.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>	R0-00 Cost already included in previous phase.	R0-00 Cost already included in previous phase.
<b>Noise:</b>	Excavating will cause an increase in noise levels.	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.	R0-00	R0-00
<b>Visual Aspects:</b>	There is no visual impact as the mining site is not visible from any roads	No mitigation measures required.	R0-00	R0-00
<b>Hauling:</b>	<b>Geology:</b>	Hauling will have no impact on the geology.	No mitigation measures required.	R0-00
	<b>Topography:</b>	Hauling will have no impact on the topography.	No mitigation measures required.	R0-00
	<b>Soil:</b>	Hauling will have no impact on the soil. There is already a existing road infrastructure as can be	No mitigation measures required.	R0-00

	seen on the satellite image on the Reg 2(2) plan.			
<b>Flora:</b>	All Flora has already been removed.	No mitigation measures required.	R0-00	R0-00
<b>Fauna:</b>	All Fauna has already vacated the site in the previous phase.	No mitigation measures required.	R0-00	R0-00
<b>Surface Hydrology:</b>	Hauling will have no impact on the surface hydrology.	No mitigation measures required.	R0-00	R0-00
<b>Groundwater:</b>	Hauling will have no impact on the groundwater.	No mitigation measures required.	R0-00	R0-00
<b>Air Quality / Dust suppression:</b>	Hauling will cause an increase in dust levels.	<p>The following steps will be taken:</p> <ul style="list-style-type: none"> <li>• A sprinkler system will be used. Water will be drawn from the holding dam on the existing mining area. The said holding dam is fed by water drawn from the Amanzi farm dam. The water will from there be pumped into the sprinkler system.</li> <li>• Periodic watering of the access roads will be conducted if and when required, especially in August and September before the raining season commence.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>	R0-00 Cost already included in previous phase.	R0-00 Cost already included in previous phase.
<b>Noise:</b>	Hauling will cause an increase in noise levels.	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.	R0-00	R0-00
<b>Visual Aspects:</b>	There is no visual impact as the mining site is not	No mitigation measures required.	R0-00	R0-00



		visible from any roads.			
<b>Backfilling:</b>	<b>Geology:</b>	The backfilling of overburden restores the geological material, but with an altered geological structure.	Backfilling is taken from the overburden stockpiled referred to above as to prepare the site for replacing of topsoil.	R0-00 Cost already catered for in the excavating phase.	R0-00 Cost already catered for in the excavation phase.
	<b>Topography:</b>	The void left by excavating is partially backfilled using overburden, thus minimising the initial negative impact. The topography however remains altered when compared with the natural topography.	Backfilling with overburden.	R0-00	R0-00
	<b>Soil:</b>	Overburden replacement.	The overburden stockpiled for rehabilitation purposes referred to above are placed on the disturbed area.	R0-00	R0-00 Cost already catered for in the excavation phase.
	<b>Flora:</b>	All Flora has already been removed.	No mitigation measures required.	R0-00	R0-00
	<b>Fauna:</b>	All Fauna has already vacated the site in the previous phase.	No mitigation measures required.	R0-00	R0-00
	<b>Surface Hydrology:</b>	Backfilling will alter the topography and cause a change in surface water runoff patterns.	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of beams and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.	R0-00 Cost already included in previous phase.	R0-00 Cost already included in previous phase.
	<b>Groundwater:</b>	Groundwater will not be impacted.	No mitigation measures required.	R0-00	R0-00
<b>Air Quality:</b>	Movement of vehicles and	The following steps will be taken:	R0-00	R0-00	

		machinery, together with dumping of overburden into the pit will increase dust levels.	<ul style="list-style-type: none"> <li>• A sprinkler system will be used. Water will be drawn from the holding dam on the existing mining area. The said holding dam is fed by water drawn from the Amanzi farm dam. The water will from there be pumped into the sprinkler system.</li> <li>• Periodic watering of the access roads will be conducted if and when required, especially in August and September before the raining season commence.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>	Cost already included in previous phase.	Cost already included in previous phase.
	<b>Noise:</b>	Movement of vehicles and machinery will increase noise levels.	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.	R0-00	R0-00
	<b>Visual Aspects:</b>	There is no visual impact as the mining site is not visible from any roads.	No mitigation measures required.	R0-00	R0-00
<b>Loading</b>	<b>Geology:</b>	Loading will be on site but will have no impact because geology will have already been taken away.	No mitigation measures required.	R0-00	R0-00
	Topography:	Loading will be on site but will have no impact because topography will have already been altered.	No mitigation measures required.	R0-00	R0-00
	<b>Soil:</b>	Loading will be on site but will have no impact because soil will have already been taken away.	No mitigation measures required.	R0-00	R0-00
	<b>Flora:</b>	Loading will be on site but will have no impact	No mitigation measures required.	R0-00	R0-00



		because flora will have already been taken away.			
<b>Fauna:</b>		Loading will be on site but will have no impact because fauna will have already temporarily vacated the area.	No mitigation measures required.	R0-00	R0-00
<b>Surface Hydrology:</b>		Loading will be on site but will have no impact because runoff will already have been altered.	No mitigation measures required.	R0-00	R0-00
<b>Groundwater:</b>		Loading will be on site but will have no impact.	No mitigation measures required.	R0-00	R0-00
<b>Air Quality / Dust suppression:</b>		Loading will cause an increase in dust levels.	<p>The following steps will be taken:</p> <ul style="list-style-type: none"> <li>• A sprinkler system will be used. Water will be drawn from the holding dam on the existing mining area. The said holding dam is fed by water drawn from the Amanzi farm dam. The water will from there be pumped into the sprinkler system.</li> <li>• Periodic watering of the access roads will be conducted if and when required, especially in August and September before the raining season commence.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>	R0-00 Cost already included in previous phase.	R0-00 Cost already included in previous phase.
<b>Noise:</b>		Loading will cause an increase in noise levels.	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.	R0-00	R0-00
<b>Visual Aspects:</b>		There is no visual impact as the mining site is not visible from any roads.	No mitigation measures required.	R0-00	R0-00

<b>Transport</b>	<b>Geology:</b>	Transport will be off site because no beneficiation will be conducted on application area. Thus no impact.	No mitigation measures required.	R0-00	R0-00
	<b>Topography:</b>	Transport will be off site because no beneficiation will be conducted on application area. Thus no impact.	No mitigation measures required.	R0-00	R0-00
	<b>Soil:</b>	Transport will be off site because no beneficiation will be conducted on application area. Thus no impact.	No mitigation measures required.	R0-00	R0-00
	<b>Flora:</b>	Transport will be off site because no beneficiation will be conducted on application area. Thus no impact.	No mitigation measures required.	R0-00	R0-00
	<b>Fauna:</b>	Transport will be off site because no beneficiation will be conducted on application area. Thus no impact.	No mitigation measures required.	R0-00	R0-00
	<b>Surface Hydrology:</b>	Transport will be off site because no beneficiation will be conducted on application area. Thus no impact.	No mitigation measures required.	R0-00	R0-00
	<b>Groundwater:</b>	Transport will be off site because no beneficiation will be conducted on application area. Thus no impact.	No mitigation measures required.	R0-00	R0-00
	<b>Air Quality:</b>	Transport will cause an increase in dust levels.	<p>The following steps will be taken:</p> <ul style="list-style-type: none"> <li>A sprinkler system will be used. Water will be drawn from the holding dam on the existing mining area. The said holding dam is fed by water drawn from the Amanzi farm dam. The water will</li> </ul>	R0-00 Cost already included in previous phase.	R0-00 Cost already included in previous phase.



			<p>from there be pumped into the sprinkler system.</p> <ul style="list-style-type: none"> <li>• Periodic watering of the access roads will be conducted if and when required, especially in August and September before the raining season commence.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers.</li> </ul>		
	<b>Noise:</b>	Transport will cause an increase in noise levels.	All machinery will be kept in good working order, to ensure that no unwanted noise is generated. Noisy vehicles or machinery will be repaired immediately to dampen noise levels on site.	R0-00	R0-00
	<b>Visual Aspects:</b>	Transport will have an effect on traffic being increased transporting the final product to the client.	All loads will be optimised to minimise trips.	R0-00	R0-00
<b>Replacing Topsoil:</b>	<b>Geology:</b>	The backfilling of overburden restores the geological material, but with an altered geological structure.	Backfilling is taken from the overburden stockpiled referred to above as to prepare the site for replacing of topsoil.	R0-00 Cost already catered for in the excavating phase.	R0-00 Cost already catered for in the excavation phase.
	<b>Topography:</b>	The void left by excavating is partially backfilled using overburden, thus minimising the initial negative impact. The topography however remains altered when compared with the natural topography.	Backfilling with overburden.	R0-00	R0-00
	<b>Soil:</b>	Topsoil replacement.	The topsoil stockpiled for rehabilitation purposes referred to above are placed on top of the overburden.	R0-00 Cost already catered for in the excavation	R0-00 Cost already catered for in the excavation

			phase.	phase.
<b>Flora:</b>	All Flora has already been removed.	This mitigation measure has already been catered for in the topsoil removal phase.	R0-00	R0-00
<b>Fauna:</b>	All Fauna has already vacated the site in the previous phase.	As vegetation re-establishes itself on the site the natural Fauna will gradually return.	R0-00	R0-00
<b>Surface Hydrology:</b>	The replacing of topsoil over the partially backfilled pit or excavation areas will have the final alteration on the topography and changed runoff patterns.	The regulations promulgated in Government Notice No 704 of 4 June 1999, in terms of the NWA (the National Water Act, (Act No. 36 of 1998)) shall apply to the water management and pollution control at the mine. The mine will make use of beams and other structures surrounding the mine areas to ensure that clean and dirty water are separated. At any time if it is identified that soil erosion is the result of storm water run-off, the mine will rectify the erosion and implement measures to ensure that erosion does not re-occur.	R0-00 Cost already included in previous phase.	R0-00 Cost already included in previous phase.
<b>Groundwater:</b>	Groundwater will not be impacted.	No mitigation measures required.	R0-00	R0-00
<b>Air Quality:</b>	Movement of vehicles and machinery will increase the dust levels.	The following steps will be taken: <ul style="list-style-type: none"> <li>• A sprinkler system will be used. Water will be drawn from the holding dam on the existing mining area. The said holding dam is fed by water drawn from the Amanzi farm dam. The water will from there be pumped into the sprinkler system.</li> <li>• Periodic watering of the access roads will be conducted if and when required, especially in August and September before the raining season commence.</li> <li>• Speed limits will be instated within the boundaries of the site to minimize the dust impact as a result of heavy trucks.</li> <li>• If dust levels on site are significantly impacted on and the dust level rise above 10mg/m<sup>3</sup> dust masks must be made available to workers..</li> </ul>	R0-00 Cost already included in previous phase.	R0-00 Cost already included in previous phase.
<b>Noise:</b>	Movement of vehicles and machinery will increase	All machinery will be kept in good working order, to ensure that no unwanted noise is	R0-00	R0-00