



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:

EC30/5/1/3/3/2/1(0408)EM
28 January 2010

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

Case ID: 2393

ATTENTION: MR. T. LUNGILE

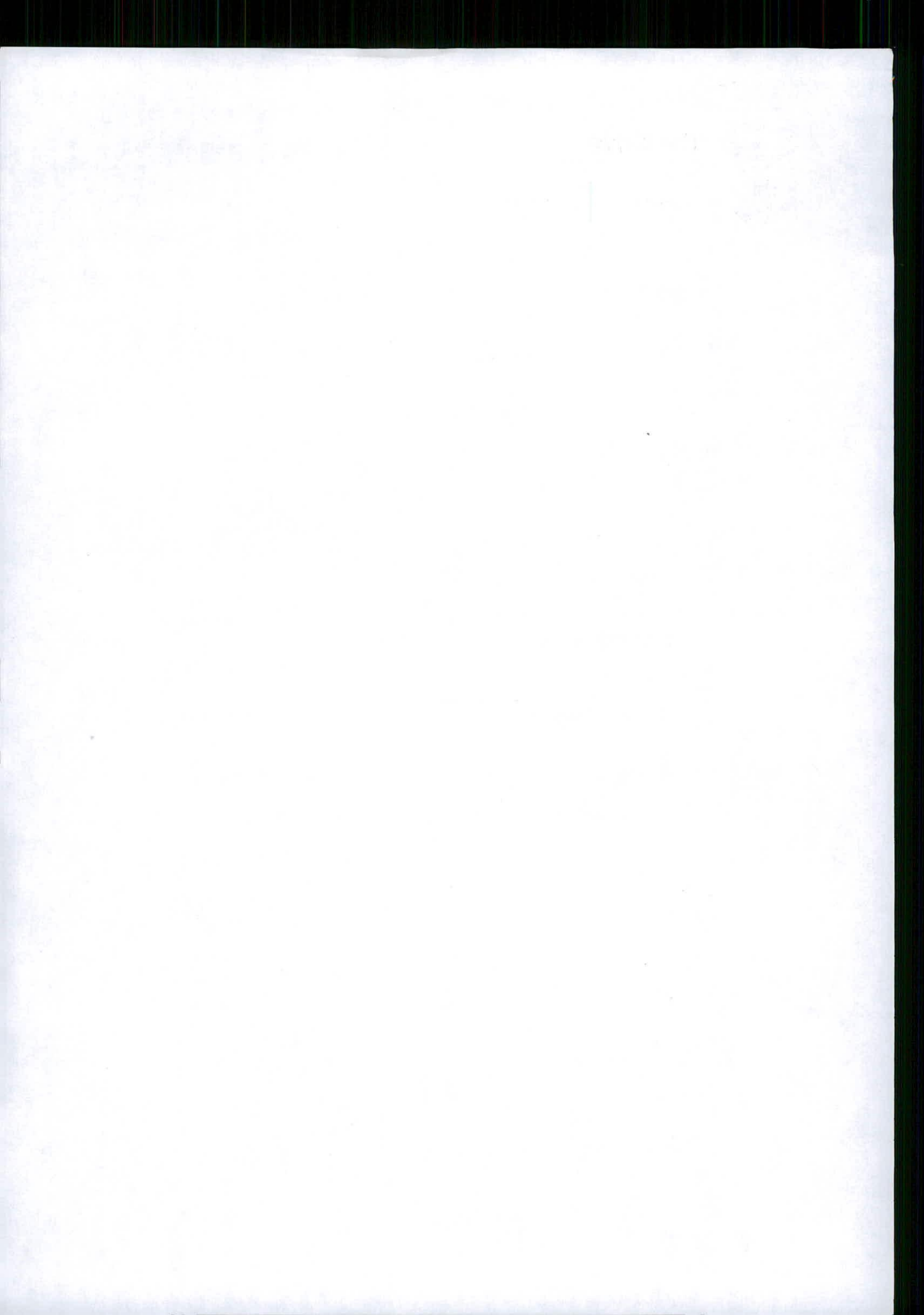
Sir

**CONSULTATION IN TERMS OF SECTION 40 OF THE MPRDA OF 2002:
ENVIRONMENTAL MANAGEMENT PLAN, NONYEZA-KANASE BORROWPIT NKANYA
ADMINISTRATIVE AREA, ELLIOTDALE, EASTERN CAPE**

1. Attached herewith, please find a copy of an EM-Plan received from Mbashe Local Municipality, for your comments.
2. Please forward any written comments or requirements your department may have in this regard, to this office no later than **15 March 2010**. 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.

Yours faithfully

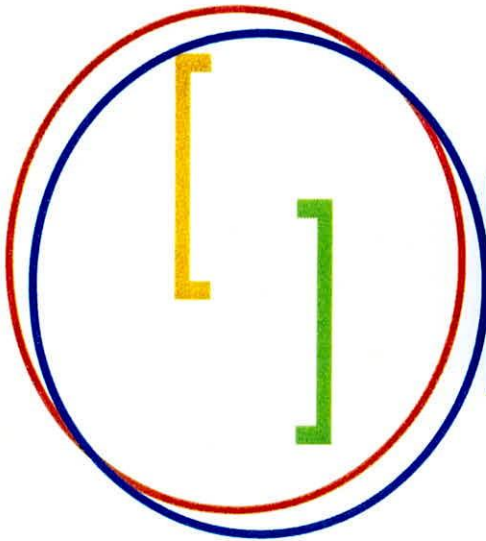
**REGIONAL MANAGER
EASTERN CAPE**



D/2010/01/14/001

Application received in terms of the Mineral and Petroleum
Resources Development Act, 2002 (Act 28 of 2002)
EASTERN CAPE REGION
14 JAN 2010
Print Name S. YIKWENGI
Signature *S. Yikwenzi*
DEPARTMENT OF MINERALS AND ENERGY

EC 30/5/1/13/2/0408 MF



NONYEZA-KANASE BORROWPIT ENVIRONMENTAL MANAGEMENT PLAN



Applicant: Mbhashe Local Municipality

Farm/ERF/AA: Nkanya Administrative Area near Elliotdale

District: Amathole District Municipality

Mineral: Gravel

Date: November 2009





P O Box 3545
Cambridge
East London
5206

2 King Edward Road
Cambridge
East London
5247

Telefax: 043 726 8638
Fax2Email: 086 548 8819
Cell Number: 083 947 4111
E-mail: xlatconsulting@gmail.com
VAT Registration Number: 4610242366

Our Ref: Nonyeza-Kanase Access Road Borrowpiti EMP

11 December 2009

FOR THE ATTENTION OF:

THE REGIONAL MANAGER
Department of Minerals and Energy
Private Bag X 6076
Port Elizabeth
6000

NONYEZA-KANASE ACCESS ROAD EXEMPTION APPLICATION AND EMP

Dear Sir / Madam

XL@Consulting cc. has been appointed by DMH Consulting Engineers on behalf of the Mbashe Local Municipality as independent Environmental Assessment Practitioners (EAP) for the environmental authorisation application process and preparation of an Environmental Management Plan (EMP) and exemption application process for the use of a borrowpiti to be used for the construction of the proposed Nonyeza-Kanase Access Road in Nkanya Administrative Area near Elliotdale within the Mbashe Local Municipality.

This letter serves as notice of my client's intent to undertake the abovementioned activity. Please find included, for your attention and response, an EMP (prepared on behalf of the Mbashe Local Municipality) for the use of the borrowpiti and a Financial guarantee letter for the rehabilitation of the borrowpiti.

Please acknowledge receipt of this letter and attached EMP and letter by sending your response to Xolisa Lupuwana of XL@Consulting cc at the contact details listed above. We look forward to receiving your further communication herein.

Yours faithfully
For and on behalf of XL@Consulting Cc.

Xolisa Lupuwana
Environmental Scientist

| | |
|---|-------------|
| Application received in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) | |
| EASTERN CAPE REGION | |
| 14 JAN 2010 | |
| Print Name | S. LUPUWANA |
| Signature | |
| DEPARTMENT OF MINERALS AND ENERGY | |

D/2010/01/14/001
Ec 30/5/13/2/0408 MP

NONYEZA-KANASE ACCESS ROAD

ENVIRONMENTAL MANAGEMENT PLAN (EMP): BORROWPIT

CONTENTS

| Chapter | Description | Page |
|----------|--|-------------|
| | DEFINITIONS | 1-1 |
| | ABBREVIATIONS | 1-2 |
| 1 | INTRODUCTION | 1-3 |
| | 1.1 Locality | 1-3 |
| | 1.2 Project Motivation | 1-3 |
| | 1.3 Purpose and the Scope of the Borrowpit Environmental Management Plan | 1-4 |
| | 1.4 Relevant Legislation | 1-4 |
| | 1.5 Format of this Report | 1-4 |
| 2 | PROJECT DESCRIPTION | 2-6 |
| | 2.1 Proposed Activity on site | 2-6 |
| | 2.2 Proposed Project Programme and Duration | 2-6 |
| | 2.3 General Information | 2-7 |
| | 2.4 Description of the Regional Aspects | 2-8 |
| | 2.5 Locality description and layout plan of the borrowpit | 2-8 |
| | 2.6 Description of the pre – excavation Environment | 2-9 |
| 3 | PROJECT MOTIVATION | 3-12 |
| | 3.1 Project benefits | 3-12 |
| | 3.2 Project alternatives | 3-12 |
| 4 | DESCRIPTION OF THE BORROWPIT | 4-1 |
| | 4.1 Surface Infrastructure required | 4-1 |
| | 4.2 Proposed rehabilitation Phase | 4-1 |

| | | |
|-----------|--|-------------|
| 5 | PUBLIC CONSULTATION | 5-1 |
| | 5.1 Background | 5-1 |
| 6 | ENVIRONMENTAL IMPACTS | 6-1 |
| | 6.1 Construction and operational Phase Impacts | 6-1 |
| | 6.2 Residual Impacts after closure | 6-2 |
| 7 | ASSESSMENT OF IMPACTS | 7-1 |
| 8 | MITIGATORY MEASURES FOR POTENTIAL IMPACTS | 8-1 |
| | 8.1 Environmental Management Plan | 8-1 |
| 9 | CONCLUSION | 9-1 |
| 10 | STATUTORY REQUIRMENTS | 10-1 |
| | 10.1 Mineral and Petroleum Resources Development Act | 10-1 |
| | 10.2 Other Relevant Legislation | 10-2 |

LIST OF TABLES

| | |
|----------------|---|
| Table 1 | Summary of the contents of this report |
| Table 2 | General information |
| Table 3 | Description of the regional setting |
| Table 4 | Description of the site locality and layout |
| Table 5 | Description of aspects that would be impacted |
| Table 6 | Environmental Impact Evaluation: Construction, Operational and Decommissioning Phases |
| Table 7 | Summary of the Environmental Management Programme |
| Table 8 | Compliance with MPRDA |
| Table 9 | Other Relevant Legislation |

LIST OF APPENDICES

| | | |
|-------------------|---|---|
| Appendix A | : | Locality Plan |
| Appendix B | : | Borrowpit Sketch Plan |
| Appendix C | : | Site photographs |
| Appendix D | : | Bank guarantee letter for the rehabilitation of the borrowpit |
| Appendix E | : | Borrowpit Geotechnical Report |

DEFINITIONS

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

Act (The Act) Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)

Borehole 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.

CARA The Conservation of Agricultural Resources Act

EIA An Environmental Impact Assessment as contemplated in Section 38(1) (b) of the Act

EMP an Environmental Management Plan as contemplated in Section 39 of the Act

Fauna All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.

Flora All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and capable of photosynthesis.

Fence A physical barrier in the form of posts and barbed wire and/or "Silex" or any other concrete construction, ("palisade"- type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.

House any residential dwelling of any type, style or description that is used as a residence by any human being

Pit Any open excavation

"Porrel" 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.

Topsoil The layer of soil covering the earth which, provides a suitable environment for the germination of seed, allows the penetration of water, is a source of micro-organisms, plant nutrients and in some cases seed 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.

Trench 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

ABBREVIATIONS

In this document, unless otherwise indicated, the following abbreviations will have the meanings as indicated here:

| | |
|------------------------|---|
| DEAT | Department of Environmental Affairs and Tourism |
| DEDEA | Department of Economic Development and Environmental Affairs |
| DME | Department of Minerals and Energy |
| DWAF | 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. |
| ECA | Environment Conservation Act No. 73 of 1989 |
| EIA Regulations | Environmental Impact Assessment Regulations (Government Notice No. R. 385 and 386) |
| EMP | An Environmental Management Plan as contemplated in Regulation 52 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) – this document. |
| MPRDA | Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) |
| NBA | National Biodiversity Act no. 10 of 2004 |
| NEMA | National Environmental Management Act No. 107 of 1998 |
| NEMAQA | National Environmental Management: Air Quality Act No. 39 of 2004 |
| NEMWA | National Environmental Management: Waste Act No. 59 of 2008 |
| NWA | National Water Act 36 of 1998 |
| OHSA | Occupational Health and Safety Act No. 85 of 1993 |

1 INTRODUCTION

1.1 Locality

The Mbashe Local Municipality has been exempted by the Department of Minerals and Energy (DME) from the process of applying for a mining permit to undertake a borrow-pit excavation for the purpose of obtaining fill material for the projects requiring the use of materials from borowpits within the Mbashe municipal jurisdiction area.

The project site is about 40 km from Elliotdale and about 20km on the South Eastern side of Madwaleni Hospital Y - 32°08'58" South and X - 28°56'71" East. Elliotdale is a small rural town within the Mbashe Local Municipality, which falls within the jurisdiction of the Amathole District Municipality.

XL@Cosnulting cc undertook an ecological scan of the proposed borrow-pit area and adjacent areas in order to determine any sensitivities or areas/items of concern with regards to the borrow-pit construction.

1.2 Project Motivation

The people in the Nkanya village experience difficulties in reaching their town, clinics, Hospital and schools especially when it's wet due to the absence of proper transport infrastructure. This road will provide access to Nkanya Clinic, Tongani J.S.S. and most importantly the Ambulances from the Madwaleni Hospital will be able to access these communities. The Nonyeza to Kanase Access road is an access road, which needs construction of 5km X 5m wide road. This road will serve the Nonyeza and Kanase villages and the other communities. The community that will be served by this road is a low-income level community.

Owing to the lack of drainage, runoff yields erosion to the existing wheel tacks and thus opening wider channels of water during storms. The project area is characterised by very steep slopes/terrain and rocky valleys. The project area consists of a total of 587 households and approximately 2 935 community members will benefit from the construction of this road. The villages that are set to benefit from this access road are Nonyeza (316 households) and Kanase (271 households).

In terms of the Regulations 27 to 36 of the Environmental Impact Assessment Regulations of 2006, promulgated in terms of Section 24(2)(a) and (d)) of the National Environmental Management Act (NEMA), Government Listing Notice Number 1 Regulation 386 Activity No. 8, the reconnaissance, prospecting, mining or retention operations as provided for in the Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA) in respect of such permissions, rights, permits and renewals thereof are identified as activities that cannot take place without authorisation by the DME. It is within such a legal framework that XL@Consulting cc prepared this Environmental Management Plan (EMP) on behalf of Mbashe Local Municipality (The Client) for submission to the DME to consider the issuing of authorisation for the use of the borrowpit.

1.3 Purpose and the Scope of the Borrowpit Environmental Management Plan

The construction of the proposed Nonyeza-Kanase access road will necessitate the excavation and operation of a gravel borrowpit. In order that the environmental impacts are minimised during the borrowpit excavation and operations the DME requires that an EMP be compiled and submitted to their Department. The purpose of this EMP is to meet the environmental requirements and directives under the MPRDA with respect to the excavation, operation and rehabilitation of the borrowpit and associated stockpile facilities.

XL@Consulting cc has been subcontracted by DMH Consulting cc as Environmental Consultants, who were appointed by the Mbashe Local Municipality as the Engineering Consultants for Nonyeza to Kanase Access near Elliotdale. As part of the environmental brief XL@Consulting cc will be compiling and submitting the EMP to DME on behalf of the client.

1.4 Relevant Legislation

Refer to Chapter 10 of this report

1.5 Format of this Report

This report comprises 10 Chapters; the contents of which are presented in **Table 1** below:

Table 1 Summary of the contents of this report

| Chapter | Contents | Purpose of Chapter |
|---------|--------------------------|---|
| 1 | Introduction | Chapter 1 introduces the project and also provides the reader with a background and rationale to the project. |
| 2 | Project description | Chapter 2 of the report introduces factual project data and information about the site pre-excavation. |
| 3 | Project Motivation | Chapter 3 introduces the motivating factors for the project |
| 4 | Description of Borrowpit | Chapter 4 gives a detailed account of the infrastructure required to excavate the borrowpit and also provides a technical description of how the borrowpit will be utilised during construction and operational phases. |

| Chapter | Contents | Purpose of Chapter |
|----------------|--|---|
| 5 | Public Consultation | Chapter 5 provides insight into the public consultation process that took place before the project was commenced. |
| 6 | Environmental Impacts | Chapter 6 describes the impacts that are likely to occur during both excavation and operational phases of the project and also indicates the potential residual impacts that may arise after closure of each borrowpit. |
| 7 | Assessment of Impacts | Chapter 7 Shows the brief assessment and evaluation of all the impacts that were introduced and described in Chapter 6. |
| 8 | Mitigatory Measure for Potential Impacts | Chapter 8 introduces the Environmental Management Plan. This is one of the tools used to mitigate against negative environmental impacts. This chapter describes the decommissioning and rehabilitation of the borrowpit as an additional mitigatory measure. |
| 9 | Conclusions | Chapter 9 provides a concluding statement to this report and typically comment as to how significantly the proposed project will affect the environment. |
| 10 | Statutory Requirements | Chapter 10 describes the relevant legislation applicable to the project. |

2 PROJECT DESCRIPTION

2.1 Proposed Activity on site

The existing road is in the form of wheel tracks, which needs proper construction. The road then can be classified as a new road construction, with one major stream crossing and three minor stream crossings. The total length of the road is 5km and will be constructed to a width of 5m. The construction of this road will involve all the gravel road layer works, installation of concrete pipes at required positions.

The scope of the project involves the following activities: -

- Clear and grub of an area of 3.5 hectares;
- Earthworks 6500m³;
- Wearing course to finished road and compacted to the specified strength approximately 3750m³;
- Installation of 30 x 600mm-diameter culvert pipes;
- Installation of portal culverts;
- Installation of subsoil drains;
- Removal of fence and reinstatement of the existing service i.e. fence, poles etc.;
- Erection of gabions and retaining wall structures; and
- Erecting of road signs.

A geotechnologist was appointed to identify and test the borrowpit situated near the start of the road to be constructed for gravel wearing course material (see locality plan in **Appendix A**). The borrowpit site is currently open and looks like it was not properly rehabilitated after it was used. The site is located near agricultural land (North of borrowpit site), which at the time of the site visit was not cultivated. A mixture of indigenous and alien tree species could be identified along a non-perennial stream (which was dry during the time of the site visit) on the Eastern side of the borrowpit site (see site photographs in **Appendix C**).

2.2 Proposed Project Programme and Duration

It has been estimated that the contract for the construction of the road will take approximately 7 months.

2.3 General Information

Table 2: General information

| | |
|---|--|
| 1.1 Full name (and surname) of person or company applying for permit or right | Mbashe Local Municipality Municipal Manager: Mr S. Dumezweni |
| 1.2 Postal address | P. O. Box 25 Dutywa 5000 |
| 1.3 Physical/ residential address | 454 Streatfiled Street Dutywa 5000 |
| 1.4 Applicant's telephone number | 047 489 5800 |
| 1.5 Applicant's cellular phone number | 073 000 5252 |
| 1.6 Alternative contact's name | Mr S. Gwentshe |
| 1.7 Alternative contact's telephone/cell phone numbers | 047 489 1492 |
| 2.1 Full name of the property on which mining/ prospecting operations will be conducted | Nkanya Village |
| 2.2 Name of the subdivision | N/A |
| 2.3 Approximate center of mining/prospecting area: | |
| Latitude | 32°08.741 South |
| Longitude | 28°56.800 East |
| 2.4 Magisterial district | Mbashe Local Municipality |
| 2.5 Name of the registered owner of the property | Department of Rural Development and Land Reform |
| 2.6 His/her Telephone number | 043 722 1762 |
| 2.7 His / her Postal address | P O Box 1958 East London 5200 |
| 2.8 Current uses of surrounding areas | Unrehabilitated borrowpit and unutilised agricultural land |
| 2.9 Are there any other, existing land uses that impact on the environment in the proposed mining/ prospecting area? | No |
| 2.10 What is the name of the nearest town? | Elliotdale |

2.4 Description of the Regional Aspects

Table 3: Description of the regional setting

| Aspect | Description |
|--|---|
| <ul style="list-style-type: none"> Description of property as per title deed <ul style="list-style-type: none"> Registered name of land (Farm and subdivision) Is the activity located near or within a water course | <p>Nkanya village Commonage</p> <p>Yes, there is a seasonal water course on the eastern boundary of the site.</p> |
| <ul style="list-style-type: none"> Proximity of neighbouring towns/cities | <p>The proposed access road is in Elliotdale approximately 20 kilometers on the south eastern side of Madwaleni Hospital.</p> |
| <ul style="list-style-type: none"> Surface Infrastructure | <p>Infrastructure to be based at borrowpit will be a TLB (Tractor Loader Back-actor) and material stockpiles.</p> |
| <ul style="list-style-type: none"> Land tenure | <p>The Traditional Leader of the Nkanya Area is the custodian of the land, but the Department of Rural Development and Land Reform is the owner of the land</p> |
| <ul style="list-style-type: none"> Adjacent land use | <p>Most of the land adjacent to the site is communal grazing land and unutilised agricultural fields .</p> |
| <ul style="list-style-type: none"> Name of the surrounding river catchment | <p>Nkanya Stream</p> |

2.5 Locality description and layout plan of the borrowpit

Table 4: Description of the site locality and layout

| Locality Description | |
|---|--|
| Aspect | Description |
| <ul style="list-style-type: none"> Name of 1:50 000 sheet | 3328BB The Haven |
| <ul style="list-style-type: none"> Roads Infrastructure District road | There is a secondary gravel access road near to the Borrowpit |
| Layout Plan of the Borrowpit Area (refer to Appendix B) | |
| Aspect | Description |
| <ul style="list-style-type: none"> Number of borrow areas | 1 |
| <ul style="list-style-type: none"> Estimated depth of the water table | There was no active groundwater seepage during the field inspection See Geotechnical Report in Appendix E . |
| <ul style="list-style-type: none"> Approximate cumulative surface areas of the proposed borrow areas | See Geotechnical Report in Appendix E . |
| <ul style="list-style-type: none"> Estimated depth of the proposed borrowpit | See Geotechnical Report in Appendix E . |
| <ul style="list-style-type: none"> Estimated duration of quarry operations | 7 months with excavation via hand or TLB |
| <ul style="list-style-type: none"> Surface area of existing borrow area | See Geotechnical Report in Appendix E . |

2.6 Description of the pre – excavation Environment

2.6.1 Location

Elliotdale is a small town in the Mbashe Local Municipality, and it falls under the jurisdiction of the Amathole District Municipality. The site is about 20km on the South Eastern side of Madwaleni Hospital.

2.6.2 Topography and Landform

The borrowpit are located on gently, sloping terrain. A small non-perennial drainage line, a tributary of the Nkanya Stream, has created a narrow drainage line on the eastern edge of the proposed borrowpit site.

2.6.3 Geology and Soils

See Geotechnical report in **Appendix E**.

2.6.4 Surface and Groundwater Environments

(a) Surface water

A third order water course (non-perennial and not flowing at time of visit) flows down the east side of the site and joins a fourth order stream joining the Nkanya Stream.

(b) Groundwater

Excavations and site establishment is unlikely to affect the ground water. Excavations did not encounter groundwater resources.

2.6.5 Ecology

(a) Vegetation

The borrowpit are located in a region that is typical Transkei Coastal Belt. All trees have been stripped from the project site. Vegetation along the watercourse adjacent to the borrowpit site, is characterised by a mixture of indigenous and alien tree species with sourveld grass in other areas.

(b) Fauna

During the site visit no terrestrial faunal species were observed at the site. This however, is not an indication that faunal species do not occur in the area, but rather that these animals are either migratory or wary due to previous human and livestock disturbances in the area. No endangered animal species were observed at the site.

2.6.6 Climate [Data incomplete in this section]

The climatic data for this region is incomplete.

(a) Precipitation

The rainfall season in the area occurs primarily during the summer months between October to March.

2.6.7 Temperature and Prevailing Winds

No wind or temperature data could be obtained for the area.

2.6.8 Evaporation

No evaporation data could be obtained for the area.

2.6.9 Notable extreme weather conditions

Based on the limited climatic data there appears to be no extreme weather conditions, however, this lack of data for the area does not necessarily exclude the possibility of extreme weather conditions occurring in the area.

2.6.10 Air Quality

At present there are no industries in the area and the existing air pollution levels are minimal. The dust generated by vehicles on the existing gravel roads is perhaps the most significant pollutant

Although the proposed borrowpit operation is expected to contribute to a small extent to the dust problem during the excavation process, the duration of this impact is considered to be small relative to the benefits of the whole project.

2.6.11 Noise

There are no significant noise generators in the area, it being a rural environment.

2.6.12 Land Ownership, Land Use and Cultural Environment

The borrowpit was used before and was not rehabilitated.

2.6.13 Socio-Economic Environment

The borrowpit operations will have a very limited life and will not impact significantly on the socio-economic environment. It is likely that a limited number of local residents could be employed in the excavation works.

2.6.14 Sensitive landscapes

The vegetation in the nearby stream must be retained and not cleared or choked with spoil/debris from the cleared site. The borrowpit is not located on a step terrain.

2.6.15 Visual Sense of Place

The borrowpit has been standing open for quite some time and therefore there will be minimal visual impact.

2.6.16 Sites of archaeological and cultural significance

There are no heritage sites on the project site. None were observed during site visit and subsequent scans.

2.6.17 Interested and Affected Parties

The borrowpit area will be rehabilitated, and should not pose a problem to residents and grazing animals. All materials from the borrowpit will be utilised in the construction of the road and as a result should not impact I&APs.

3 PROJECT MOTIVATION

3.1 Project benefits

The people in the village/ward experience difficulties in reaching their town, clinics, Hospital and schools especially when it's wet due to the absence of proper transport infrastructure. The planned Nonyeza to Kanase access road will serve Nonyeza and Kanase villages and the other communities. The community that will be served by this road is a low-income level community.

The following numbers of households and population figures have been cited from the demarcation board of Municipalities under SA Explorer. Population figures hereunder are expected to be precise however there they will be confirmed during the implementation of the project. The number of households in the project area is 2008 informal households.

The communities in the project area will be the primary beneficiaries of this project.

- No. of households = 587
 - Total Population = 2935
-

3.2 Project alternatives

Owing to the lack of drainage, runoff yields erosion to the existing wheel tracks and thus opening wider channels of water during storms. The project area is characterised by very steep slopes/terrain and rocky valleys.

The alternatives considered when evaluating this project were:

Option A The 'NO GO' Option; and

Option B The construction of the proposed Nonyeza-Kanase Access Road along the existing wheel tracks.

Option B was selected, as Option A would not have served the basic needs of the people in the Nonyeza and Kanase area without drivable roads. Option A was chosen so as to rehabilitate the eroded wheel tracks into a well designed and engineered access road. The construction of the road will also provide temporary employment for some local people in the area for the duration of the project.

4 DESCRIPTION OF THE BORROWPIT

The proposed borrowpit is intended to operate only for the duration of the Contract, i.e. approximately 6 months. To this end the proposed infrastructure and other facilities required for the operation of the borrowpit will be of a temporary nature. The identified borrowpit site is in close proximity to the planned access road route. Though not currently active, the borrowpit has already been used in the past, but has not been rehabilitated. The use of this borrowpit will present the opportunity of it being properly rehabilitated after use.

4.1 Surface Infrastructure required

In the excavation of borrowpit, material will either be excavated by hand but in most cases the use of a TLB (Tractor Loaded Back-actor). Materials excavated from each borrowpit will be stockpiled in an area close to the respective pits or loaded directly into the vehicles transporting the materials to site. This process will ensure easy access and transportation of the materials to the designated sites.

4.2 Proposed rehabilitation Phase

4.2.1 Current State of Borrowpit

Uncontrolled erosion has exposed the borrowpit surface to furrowing and channelling of the proposed borrowpit as a result of it not being rehabilitated after previous use. This borrowpit will be backfilled and rehabilitated. Presently it is exposed to all weather elements that could result in significant erosion.

4.2.2 Planned Rehabilitation

After the completion of the contract, the borrowpit area will be backfilled and revegetated, using the available vegetated topsoil that will be cleared in preparation for exaction.

5 PUBLIC CONSULTATION

5.1 Background

The land for the proposed access road and borrowpit is located on communal land under the jurisdiction of the Nkanya Administrative area's Chief Zwelithobile Tongani. The Department of Land Affairs are the custodians of this communal land and were also afforded an opportunity to comment by sending them the project Background Information Document

The Nkanya Administrative area residents were consulted regarding the constriction of the road and the use of the borrowpit material and they had no objections to this project. A newspaper advertisement inviting people to a public meeting and to participate in the Public Participation Process was placed in the Daily Dispatch on Wednesday, 12 August 2009 and a Public Meeting was held at the Nkanya Great Place on Friday, 21 August 2009. The general population in the area is fully supportive of the project as they are going to benefit from the proposed access road and the ease of access that the road will be providing. An environmental and social impact assessment key issues report (written in both English and isiXhosa) was sent to the community for comments and review after the site visit and public meeting. No negative comments were received from the Interested and Affected Parties.

The formation of a **Project Steering Committee (PSC)** affords the public the opportunity to be involved in and updated on the development / progress of the Project during the pre-construction and construction phases. The PSC is comprised of members from all affected communities in the Nkanya Administrative Area. The PSC functions as the communication link between the public and the Project Team and Contractor.

6 ENVIRONMENTAL IMPACTS

6.1 Construction and operational Phase Impacts

This section briefly describes the various impacts that will occur during the construction, operation and decommissioning phases of the project. Thereafter the impacts are assessed in terms of specific criteria as described in Chapter 7.

Although the construction phase will impose impacts on the environment, these will occur over a period of a few days during which equipment is brought into the site. This will result in small and insignificant impacts to the area which has already been cleared of vegetation.

The overall significance is considered to be low and it will not affect the decision to proceed with the project. The operational phase of the project will have a greater impact on the environment and is discussed below.

Table 5: Description of aspects that would be impacted

| Aspect | Impact |
|-----------------|--|
| Geology | Establishment of borrowpit will entail the disturbance of the existing geology; through the removal and use of materials. The impact of this is a change in the geomorphologic process due to the removal of rock and other materials from the landscape. |
| Topography | The borrowpit walls will be up to 1-2 m in depth and the resulting stockpiles will alter the gentle slopes of the surroundings during the operational period, but this will cease once materials have been removed and used on the housing site. The potential impacts are: <ul style="list-style-type: none"> • High borrowpit walls constitute a safety to humans and livestock. • The impact may be exacerbated by the fact that the borrowpit is located near the main access road. |
| Soils | Topsoil cover will be removed during borrowpit excavation <i>in situ</i> soil profiles will be disturbed during the excavation and re-filling process. The potential impacts are: <ul style="list-style-type: none"> • Wind and water erosion of the small quantities of topsoil stockpiles. • Ingress of exotic plant species to the detriment of any indigenous grasses and bush. |
| Land Capability | Historical land use on site was a borrowpit and therefore there will be no significant impact on the current land capability. |
| Land Use | The proposed borrowpit site is in an area that was used as a borrowpit. |
| Flora | There is little or no vegetation in the areas demarcated for borrow purpose as the site was cleared of vegetation for the establishment of the previous borrowpit. |

| Aspect | Impact |
|---------------------------------------|---|
| Fauna | The relatively small areas disturbed by the borrowpit is not expected to have a significant impact on the natural wildlife. Wildlife is expected to move away from the borrow area because of the noise and construction of the road. |
| Surface Water | Certain amounts of rainfall and runoff from the site will collect in the borrowpit, once it is full, it has the potential to contribute to the overall runoff of the entire cleared site. As a result runoff from the site could contain significant amounts of silt. |
| Air Quality | The air quality will be impacted by dust resulting from excavating, loading, haul vehicles, and tipping. The dust generation will probably be greatest at the excavation and dumping points on the site. Stockpiles left for any period of time will also be exposed to wind erosion. |
| Noise | Sources of noise will be the excavating, hauling and compaction of the base course materials. |
| Archaeological/cultural sites | No such sites were observed within the proposed borrowpit area. |
| Sensitive Landscapes | The only sensitive landscape near to the borrow area is the drainage line and the vegetation within the nearby stream of that drainage line. |
| Regional and socio-economic structure | The borrow area will have a short-term positive effect on the local economy, as there will be a need for labour. The financial rewards as well as potential increased spending in the local shops by workers and the operators will be beneficial to the local community. |
| Interested and affected parties | No residual stockpiles will remain for the use of I&APs. |

6.2 Residual Impacts after closure

There may be some subsidence in the levels within the backfilled and reinstated borrowpit when it is inundated after the first heavy rains of the season. The Municipality will need to ensure that the borrowpit is reinstated and filled to original ground level, should this occur.

Depending on the levels of compaction in and around the borrow area, the potential for erosion will exist and will need to be assessed after the first summer rains.

7 ASSESSMENT OF IMPACTS

This section summarises the significance of the positive and negative impacts on the environment which are likely to be caused by the borrowpit operations in the construction, operation and the closure phases. The assessment was based on the professional judgement by the authors rather than empirical verification methods.

7.1.1 Assessment Criteria

The criteria used in this assessment are described below:

Spatial extent of the impact

Will the impacts be limited to a local scale (i.e. within the boundaries of the borrow areas), to the region (i.e. Eastern Cape) or will the impacts manifest on a national scale?

Duration of the impact

Is the impact

- Immediate (i.e. limited to a very short period)
- Short-term (0 – 5 years)
- Medium-term (6 – 15 years)
- Long-term (where the impact will cease after the operational life scheme)
- Permanent (the impact will persist beyond the operational life scheme)

Intensity of the impact

Is the intensity of severity of the impact:

- Low (where the impact affects the environments in such a way that physical, biological, cultural, social and economic functioning and processes are not affected);
- Medium (where the affected environment is altered but physical, biological, cultural, social and economic functioning and processes continue albeit in a modified way); and
- High (where physical, biological, cultural, social and economic functioning and processes are altered to the extent that they will temporarily or permanently cease).

Probability of occurrence

Consider the likelihood of the impact actually occurring:

- Improbable (the possibility of the impact materialising is very low as a result of design or historic experience)
- Possible (there is a possibility that the impact will occur, though it is not likely)
- Probable (it is most likely that the impact will occur)
- Definite (the impact will occur regardless of the implementation of any prevention measures)

Significance of the impact

Based on a synthesis of the information contained in a – d above, the potential impacts were assessed in terms of the following significance criteria.

- Low significance: where the impact would not have any influence on the decision to proceed with the borrowpit operations.
- Moderation significance: where the impact should influence the decision to proceed with the borrowpit operations unless it is effectively mitigated.
- High significance: where the impact would influence the decision to proceed with borrowpit operations regardless of any mitigation measures.

Status of impact

- Indicate whether the impact is negative (a `cost'), positive (a `benefit') or neutral.

Degree of confidence in predictions

The level of confidence in the predictions is stated as either:

- Low
- Medium, or
- High.

7.1.2 Assessment

Our evaluation of the key impacts is summarised in **Table 7** below.

Deemed to be of high significance will be the impact that the project will have on the soil in the area. The profile of this soil will be permanently altered, but by adhering to the actions suggested in the EMP, the contractor should be able to mitigate some negative actions.

The key impacts emanating from the assessment are: topography, soils, surface water and sensitive landscape. These all have a moderate significance; these can all be mitigated to a low significance, which implies that they should not influence the decision to proceed with the borrowpit site. Mitigating measures to address these impacts are described in Section 8.

The impacts with a low significance rating will not have any influence on the decision to proceed with the borrowpit excavation and operation. Mitigating measures are also provided to minimise these impacts still further.

The proposed mitigating measures are considered to be sufficient to effectively mitigate the low and moderate significance impacts and thus the decision can be made to proceed with the proposed borrowpit operation.

Table 6: Environmental Impact Evaluation : Construction, Operational and Decommissioning Phases

| Impact on: | Criteria | | | | Description | Significance (Without mitigation) | Significance (With mitigation) | Status | Confidence |
|------------------------------------|----------|----------|-----------|-------------|---|--------------------------------------|-----------------------------------|--------|------------|
| | Extent | Duration | Intensity | Probability | | | | | |
| Geology | L | S | H | D | Permanent alteration of the geology through removal of material | L | L | N | H |
| Topography | L | S | H | D | Topography altered through excavation of borrowpit | M | L | N | M |
| Soils | L | S | M | D | Removal of soil from borrow areas and stockpiling for rehabilitation | M | L | N | M |
| Natural Vegetation | L | P | M | D | Majority of the vegetation has been removed from the site already. | L | L | N | H |
| Animals | L | L | M | PR | Few species may be displaced by borrowpit operation. | L | L | N | M |
| Surface Water | L | P | M | D | Runoff from the un-vegetated site could exacerbate the potential for erosion in and adjacent to the borrow areas. | M | L | N | H |
| Groundwater | L | P | L | I | Groundwater located at depth – no impact | L | L | - | H |
| Air Quality | L | S | L | P | Dust generated by excavation, hauling and layer works will affect local residents | L | L | N | H |
| Noise | L | S | L | P | Discomfort to local residents | L | L | N | M |
| Sensitive Landscape | L | L | M | D | Uncovered/ un rehabilitated borrow area could cumulatively add to the siltation of the drainage course to the west of the site. | M | L | N | H |
| Regional Socio-economic Structures | L | S | L | PR | Local residents potentially benefit from proposed operations | L | L | P | M |

Extent: - **L** - Local **R** - Regional **N** - National
 Duration: - **S** - Short-term **M** - Medium-term **L** - Long-term **P** - Permanent
 Intensity: - **L** - Low **M** - Medium **H** - High
 Probability: - **I** - Improbable **P** - Possible **PR** - Probable **D** - Definite
 Status: - **N** - Negative (a cost) **P** - Positive (benefit)
 Confidence: - **L** - Low **M** - Medium **H** - High

8 MITIGATORY MEASURES FOR POTENTIAL IMPACTS

8.1 Environmental Management Plan

This section documents the measures to be taken to mitigate the potential impacts of the construction and operation of the borrow area and stockpiles. The following points are relevant to this section:

- (a) The controls and management methods specified below will be legally binding in terms of Mineral Act (Act 50 of 1991) and its regulations as amended by Act 103 of 1993.
- (b) The party responsible for the implementation of the management plan is Mbashe Local Municipality. However, the agency can contractually bind the contractors into a binding agreement for the construction, operation, closure and rehabilitation of the facilities.

Table 7: Summary of the Environmental Management Programme

| Impact Category | Mitigation and Management Plan |
|----------------------|--|
| Topography | The site where the borrow area has been established has been used as a borrowpit in the past. The extent of the borrow area is such that they will not have a regional impact. However, the local impact will be medium if the borrow area are poorly reinstated. Recommendations are that the borrow area is rehabilitated so that it does not pose a danger to the residents, livestock or people in the area. |
| Soils | The topsoil that is removed from the surface of the borrow areas is an essential ingredient for the eventual rehabilitation of the borrow area. This topsoil material must be removed and stored for rehabilitation of these borrowpit. The soil will be stored in stockpiles not exceeding 1.5 m in high during the operation of the borrowpit and then used to backfill the borrowpit. Seeding of the topsoil should be undertaken to assist in stabilisation. |
| Surface water | The borrow areas should be rehabilitated as soon as is practical, so as to reduce the potential for erosion of these areas as well as their potential contribution of silt to any adjacent surface runoff as a result of rainfall. See Table 7. |
| Sensitive landscapes | The nearby stream must be demarcated and all site staff made aware of the boundaries of this site. Site staff must also be told not to litter/ dump spoil from the site into this area. |
| Aesthetics | The borrowpit site maybe used as a borrowpit in the future. The borrow area must be rehabilitated so that it does not impact/ influence the visual or aesthetics of the area as it is located near a road. |

Once the excavation and operation is complete at the borrow area, the site will be closed, contoured and rehabilitated to the correct level.

It is not likely that either the municipality or I&APs will use additional materials from the site. Some of the materials sourced from the borrow area will be used to rehabilitate the site.

9 CONCLUSION

The proposed borrowpit and stockpiling operation, are located on a communal land and will provide the necessary gravel products for the construction of the internal roads and other services within the Nkanya villages (Nonyeza and Kanase).

The borrowpit and associated operations will be designed and operated to minimise the impact on the environment. The contractor will implement recommendations made in the EMP document to mitigate for the negative impacts. Medium significant impacts are likely to be on the topography, soils, surface water and sensitive landscapes of the site

However, these medium impacts can be mitigated to a low significance and this will not influence the decision to proceed with the project. All other impacts are of a low significance prior to mitigation and will also not affect the decision to proceed with the project.

These negative impacts are regarded to be worthwhile considering the overall positive benefits to the local community and the ultimate provision of a drivable access road for the community.

10 STATUTORY REQUIREMENTS

10.1 Mineral and Petroleum Resources Development Act

Table 8: Compliance with MPRDA

| Section of Act | Legislated Activity/ Instruction/ Responsibility or failure to comply | Penalty in terms of Section 99 |
|----------------|--|---|
| 5(4) | No person may prospect, mine, or undertake reconnaissance operations or any other activity without an approved EMP, right, permit or permission or without notifying land owner | R 100 000 or two years imprisonment or both |
| 19 | Holder of a Prospecting right must: lodge right with Mining Titles Office within 30 days; commence with prospecting within 120 days, comply with terms and conditions of prospecting right, continuously and actively conduct prospecting operations; comply with requirements of approved EMP, pay prospecting fees and royalties | R 100 000 or two years imprisonment or both |
| 20(2) | Holder of prospecting right must obtain Minister's permission to remove any mineral or bulk samples | R 100 000 or two years imprisonment or both |
| 26(3) | A person who intends to beneficiate any mineral mined in SA outside the borders of SA may only do so after notifying the Minister in writing and after consultation with the Minister. | R 500 000 for each day of contravention |
| 28 | Holder of a mining right or permit must keep records of operations and financial records AND must submit to the DG: monthly returns, annual financial report and a report detailing compliance with social & labour plan and charter | R 100 000 or two years imprisonment or both |
| 29 | Minister may direct owner of land or holder/applicant of permit/right to submit data or information | R 10 000 |
| 38(1)(c) | Holder of permission/permit/right MUST manage environmental impacts according to EMP and as ongoing part of the operations | R 500 000 or ten years imprisonment or both. |
| 42(1) | Residue stockpiles must be managed in prescribed manner on a site demarcated in the EMP | A fine or imprisonment of up to six months or both |
| 42(2) | No person may temporarily or permanently deposit residue on any other site than that demarcated and indicated in the EMP | A fine or imprisonment of up to six months or both |
| 44 | When any permit/right/permission lapses, the holder may not remove or demolish buildings, which may not be demolished in terms of any other law, which has been identified by the Minister or which is to be retained by agreement with the landowner. | Penalty that may be imposed by Magistrate's Court for similar offence |
| 92 | Authorised persons may enter mining sites and require holder of permit to produce documents/ reports/ or any material deemed necessary for inspection | Penalty as may be imposed for perjury |
| 94 | No person may obstruct or hinder an authorised person in the performance of their duties or powers under the Act. | Penalty as may be imposed for perjury |
| 95 | Holder of a permit/right may not subject employees to | Penalty as may be |

| Section of Act | Legislated Activity/ Instruction/ Responsibility or failure to comply | Penalty in terms of Section 99 |
|----------------|--|--|
| | occupational detriment on account of employee disclosing evidence or information to authorised person (official) | imposed for perjury |
| All sections | Inaccurate, incorrect or misleading information | A fine or imprisonment of up to six months or both |
| All sections | Failure to comply with any directive, notice, suspension, order, instruction, or condition issued | A fine or imprisonment of up to six months or both |

10.2 Other Relevant Legislation

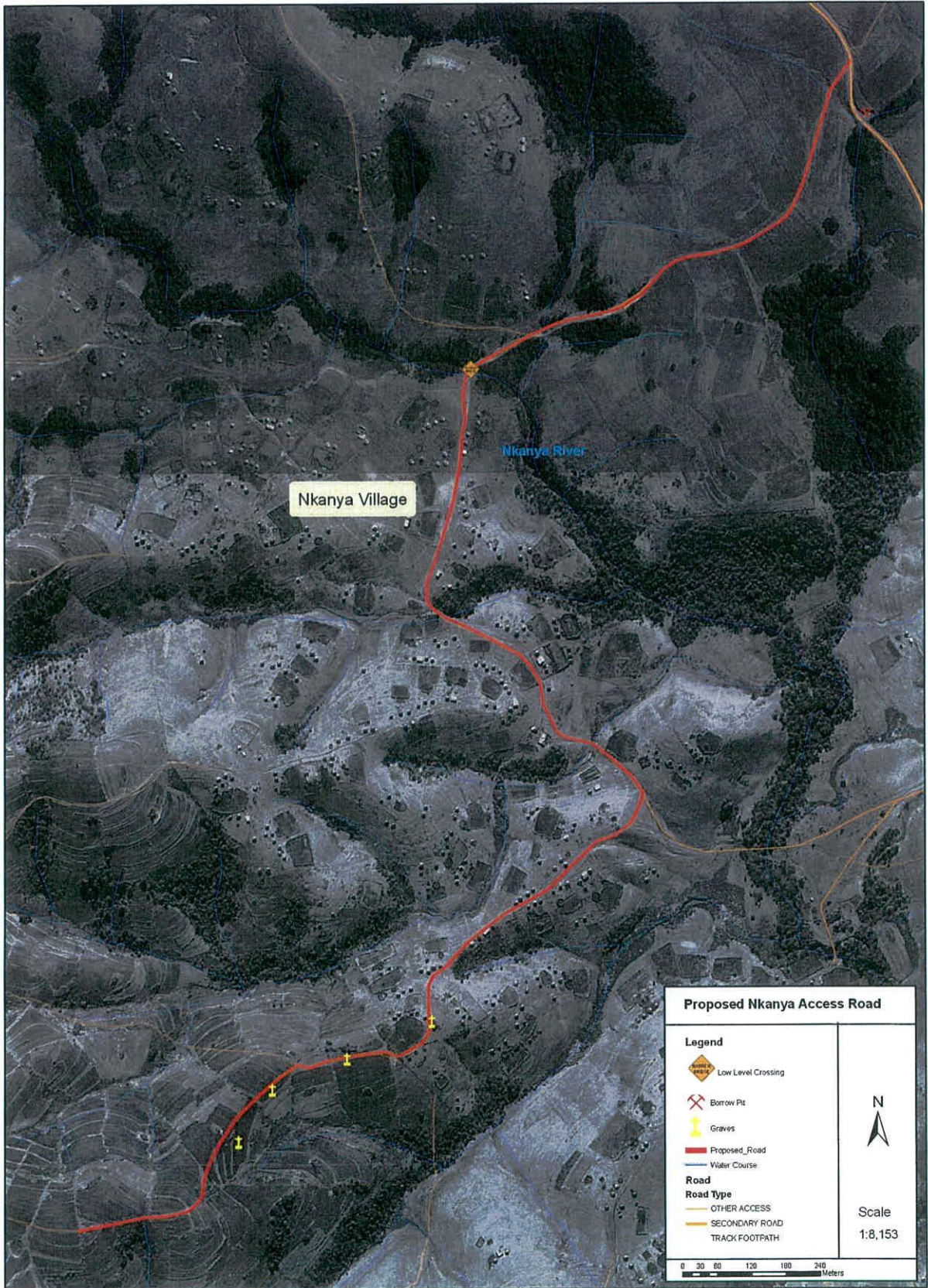
Other applicable legislation cable includes:

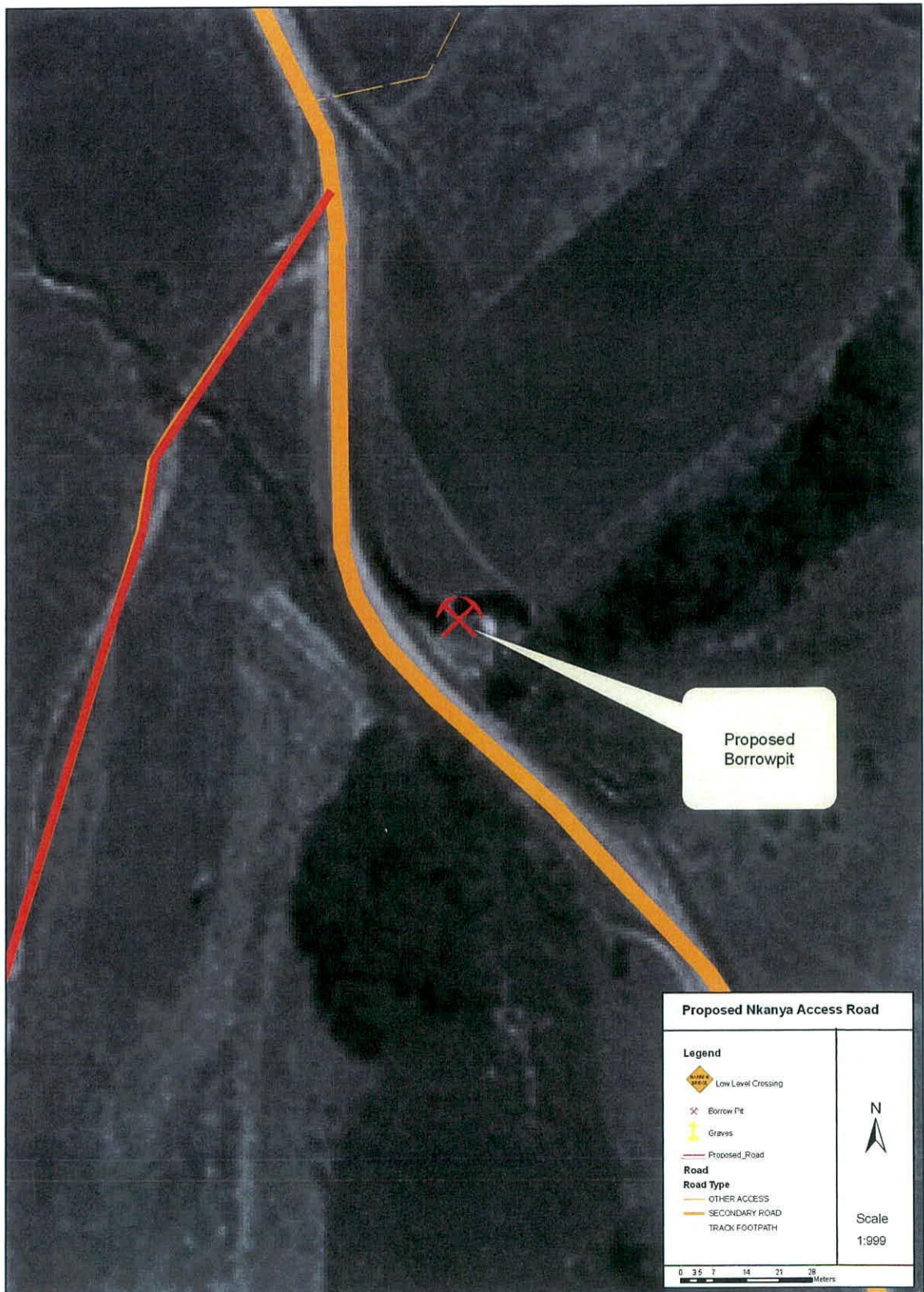
Table 9: Other Relevant Legislation

| Title of legislation, policy or guideline: | Administering authority: | Date: |
|--|---|-------|
| The Environment Conservation Act (ECA) No. 73 of 1989 | Department of Environmental Affairs and Tourism | 1989 |
| Occupational Health and Safety Act (OHSA) No. 85 of 1993 | Department of Labour | 1993 |
| National Biodiversity Act no. 10 of 2004 | Department of Environmental Affairs and Tourism | 1996 |
| Environmental Impact Assessment Regulations (Government Notice No. R. 385 and 386) | Department of Environmental Affairs and Tourism | 1996 |
| National Environmental Management Act (NEMA) No. 107 of 1998 | Department of Environmental Affairs and Tourism | 1998 |
| National Water Act (NWA) 36 of 1998, | Department of Water Affairs and Forestry | 1998 |
| National Environmental Management: Air Quality Act (NEMAQA) No. 39 of 2004 | Department of Environmental Affairs and Tourism | 2004 |
| National Environmental Management: Waste Act (NEMWA) No. 59 of 2008 | Department of Environmental Affairs and Tourism | 2008 |

Appendix A

Locality Plan





Appendix B

Borrowpit Sketch Plan

See Appendix E

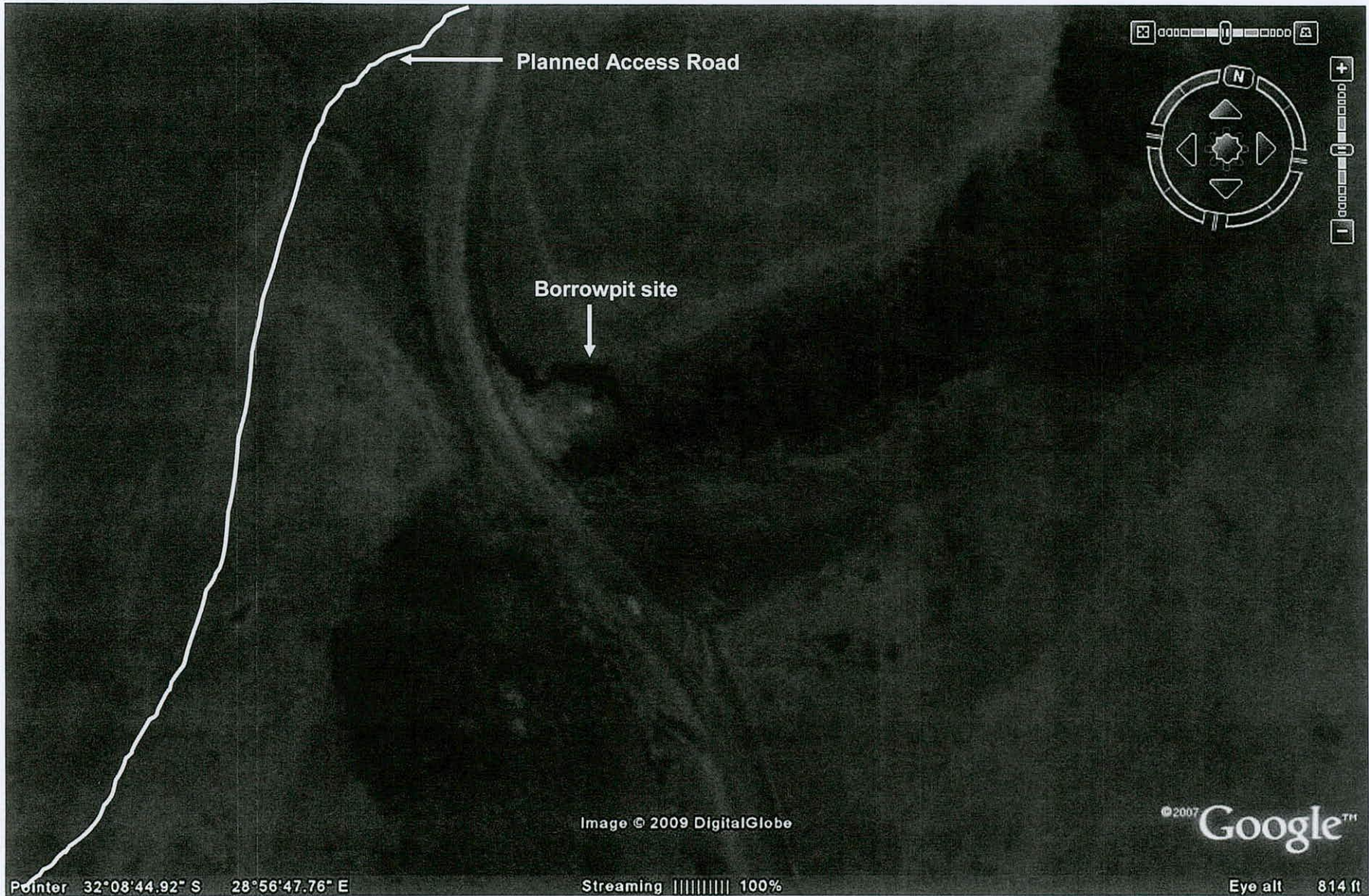
Appendix C

Site photographs



Nonyeza-Kanase Access Road Borrowpit EMP

Mbashe Local Municipality



Planned Access Road

Borrowpit site

Pointer 32°08'44.92" S 28°56'47.76" E

Streaming ||||| 100%

Eye all 814 ft

Appendix D

Bank guarantee letter for the
rehabilitation of the borrowpit

All communications
to be directed to the
Municipal Manger

File Ref. No.

*Municipality
of Mbhashe*



*Umasipalathi
wase Mbhashe*

Zonke
linkcukacha
mazibhekiswe ku
Manejala

Ref.

MUNICIPAL OFFICES
I-OFISI ZIKA MASIPALATHI
P.O. Box / Ibhoksi 25
DUTYWA
5000
Phone / Ifoni 047 489 1492
Fax 047 489 2404

The Regional Manager
Department of Mineral and Energy
PORT ELIZABETH
EASTERN CAPE

**FINANCIAL GUARANTEE FOR (NONYEZA TO KANASE ACCESS ROAD)
THE REHABILITATION OF LAND DISTURBED BY MINING (EXECUTION OF
ENVIRONMENTAL MANAGEMENT PROGRAMME)**

1. Concerning the responsibility in terms of Mineral and Petroleum Resources Development Act 28 of 2002, which is incumbent on Nkanya Administrative Area (hereinafter referred to as "the mine owner") to execute the environmental management programme approved in terms of the provisions of the said Act for the mine known as Nkanya Borrowpit situated in the magisterial district of Elliotdale

Province of the Eastern Cape, I/We S. DUMEZWENI, in my/
our capacity/capacities of.....

and as duly authorized representative/s of Mbhashe Local Municipality

(hereinafter referred to as "the guarantor") confirm that the amount of

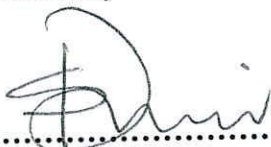
R 100,000.00 (One Hundred Thousand Rand) is available to you for the purpose of executing the said environmental management programme.

2. The guarantor, who hereby waives the advantages of the exceptions *non numeratae non causa debiti excussionis et divisionis*, the meaning and the consequences of which is known to the guarantor, undertakes to pay to you the said sum of

R 100,000.00(One Hundred Thousand Rands) upon receipt of a written claim from you to do so and the claim may be submitted by you, if (in your opinion and discretion) the mine owner fails or remains in default to execute the said environmental management programme, or if he ceases mining/prospecting operations, or if his estate is sequestrated, or if he should hand over his estate in terms of the Insolvency acts which are applicable in the Republic of South Africa, or if the guarantor gives written notice to you in terms of clause 5 of this agreement. The said claim may be instituted by you at any stage commencing from the date of signature of this guarantee.

3. The said amount of **R 100,000.00** may be held by you on the condition that you, after having complied with all the provisions of the said environmental management programme, will give account to the guarantor of how the amount was appropriated and repay any unappropriated amount to the guarantor.
4. This undertaking is neither negotiable nor transferable, and-
- a) must be returned to the guarantor when giving account to the guarantor in terms of clause 3 above,
 - b) shall lapse on the granting of a closure certificate in terms of the Mineral and Petroleum Resources Development Act 28 of 2002, and
 - c) shall not be construed as placing any other responsibility on the guarantor other than the paying of the guaranteed amount
5. The guarantor reserves the right to withdraw from this guarantee after having given you at least three months' written notice in advance of his intention to do so.

Yours faithfully



.....
(SIGNATURE)

ACTING MUNICIPAL MANAGER

24/11/09
.....
DATE

Appendix E

Borrowpit Geotechnical Report

Reference: 15092009 Brief report - 48809.doc

15 September 2009

DMH Consulting
PO Box 525
Gonubie
5256

Attention: Mr P Mdlulwa

NONYEZA TO KANASI ACCESS ROAD: BRIEF MATERIALS REPORT

ControlLab was requested to do a road indicator tests on samples collected from this project. One (1) existing borrow pit in the area as well as samples from the existing gravel road were investigated to determine the quality (TRH14 and TRH20 classification) of the material. Samples were taken from the face of the borrow pit at three positions and the GPS coordinates of the positions were:

- A - S 32°08.739 E 28°56.796
- B - S 32°08.741 E 28°56.800
- C - S 32°08.742 E 28°56.802





Three (3) disturbed soil samples were taken for Road Indicators, California Bearing Ratio (CBR) and Atterberg Limits tests. All the test results are attached to this document.

The site is situated approximately 100km south of Mthatha in the Eastern Cape Province. The closest town to the site is Elliotdale which is 40km from the site.

According to the geological map number 3228 Kei Mouth published in 1979 by the Chief Director of Surveys and Mapping, the area under investigation falls within the Karoo sequence, embracing the Ecca group. The formations would generally consist of Mudstones, Sandstones, Shale and Dolerite intrusions.

Elliotdale normally receives about 638mm of rain per year, with most rainfall occurring mainly during midsummer. It receives the lowest rainfall (8mm) in July and the highest (93mm) in March. The monthly average midday temperatures for Elliotdale range from 19.6°C in July to 25.4°C in February. The region is the coldest during July when the mercury drops to 6.8°C on average during the night.

Wienerts climatic N number for the area is less than 2, which should indicate that the rocks would decompose implying that chemical weathering would dominate over mechanical weathering.

BRIEF INTERPRETATION OF THE TEST RESULTS

• ROAD INDICATORS

Three (3) disturbed samples were tested for CBR, grading and Atterberg limits. The grading was used to classify the material sampled according to the TRH 20: 1990 (The structural design, construction and maintenance of unpaved roads).

The CBR, Atterberg limits and grading was used to classify the material according to the TRH 14 (Guidelines for road construction materials) and classifications are indicated below:

| Position number | Material description | TRH 20 classification | TRH 14 classification |
|-----------------|--|-----------------------|-----------------------|
| Borrow Pit | Light red brown Shale with clayey sand | B | G5 |
| Km0.800 | Light brown Shale with silty sand | B | G5 |
| Km2.300 | Dark brown decomposed Dolerite with silty sand | B | G6 |

The plasticity index (PI) of the materials tested varied between semi plastic (SP) and 13, the maximum dry density (MDD) between 1899kg/m³ and 1922kg/m³ and the optimum moisture content between 7.9% and 12.0%.

The LA Abrasion tests gave a result of 14 indicating that the material in the borrow pit will not break down under normal grid rolling and a single stage crusher may be necessary. The Venter tests gave "II" results indicating disintegration into hard fragments with some open crack.

The TRH20 requires a minimum CBR value of 15 at 95% of modified AASHTO density for a gravel wearing course. The material sampled and tested conformed to this requirement.

The oversize index as determined on the 37.5mm sieve varied between 0% and 19% and allowance would have to be made for the removal of oversize material as the allowable percentage of material bigger than 37.5mm is given in the TRH20 as 5%.

The TRH 20 classification can be explained by the following:

- A classification – material in this area generally performs satisfactory but is fine graded and particularly erodible material. Roads constructed from these materials perform satisfactorily but may require periodic labour intensive maintenance and have high gravel loss due to erosion;
- B classifications – these materials generally lack cohesion and are highly susceptible to the formation of loose materials (ravelling) and corrugations;
- C classification – materials generally conforms to gab-graded gravel and lacks adequate cohesion resulting in loose materials that are prone to ravelling;
- D classification – Materials with a shrinkage product in excess of 365 tends to be slippery when wet;
- E classification – material in this zone generally performs well provided that the oversize materials are limited to the recommended limits.

The material tested will be suitable for use as gravel wearing course but will be prone to ravelling. Please note that although all the material will be suitable care must be taken in using the Shale on steep areas as the Shales may be slippery when wet.

A total of 3750m³ of material will be required for the wearing course. It is recommended that the existing borrow pit be extended to the northern side and that the decomposed dolerite sampled at km2.300 be used as wearing course.

While every effort has been made during the fieldwork phase of this investigation to identify the various soil horizons, their problems and distribution, it is impossible to guarantee that isolated zones of poorer material have not been missed. The investigation

was, however, thorough and conditions are not expected to vary from those described in this report. Disparities in the material type should be referred to an expert.

The report does not provide a pavement or borrow pit design but merely interpretation of the use of the available materials.

Regards,

Deon Louw
Pr. Tech. Eng, MSc (Civil)