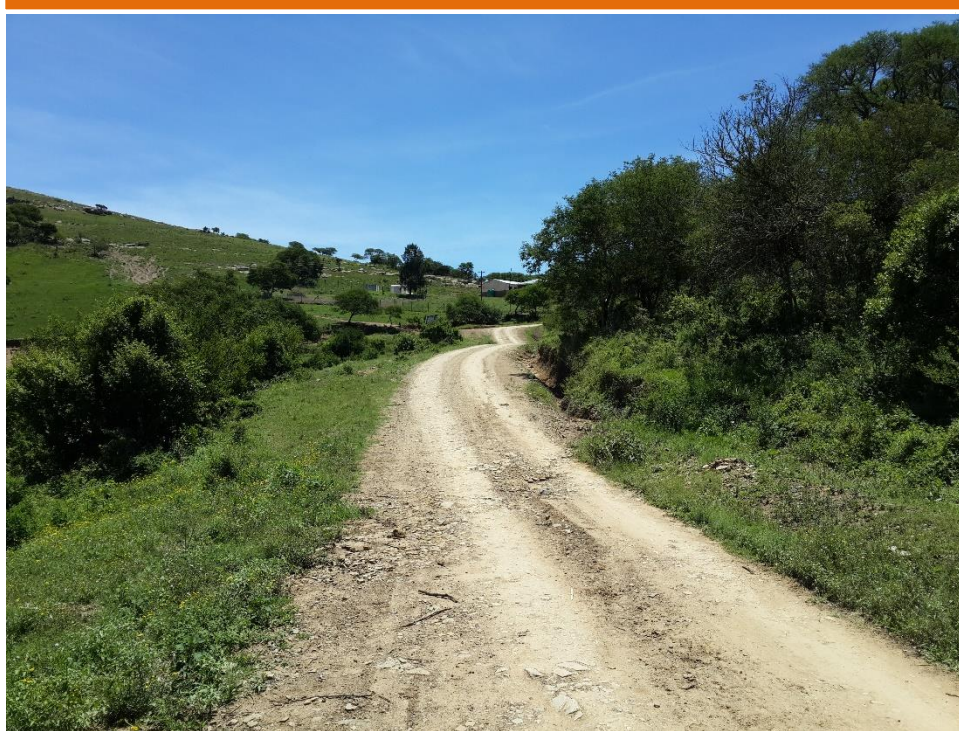




HANSLAB (PTY) Ltd
ENVIRONMENTAL AND GROUND
ENGINEERING SPECIALIST

2017

DRAFT BASIC ASSESSMENT REPORT



PROJECT NAME: NTABENZIMA MUD TRACK
AREA/MUNICIPALITY: MVOTI MUNICIPALITY
CLIENT: DEPARTMENT OF TRANSPORT (DOT)

P.O. BOX 2135

Umhlanga Manors

4021

Tel No: 031 563 1978

Fax No: 086 552 4224

BEE Status: Level One

sheldon@hanslab.co.za



edtea

Department :
Economic Development, Tourism and
Environmental Affairs

PROVINCE OF KWAZULU-NATAL

(For official use only)

File Reference Number:

Application Number:

Date Received:

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

CONSULTANT DETAILS	
COMPANY	HANSLAB (Pty) Ltd
POSTAL ADDRESS	P.O. Box 2135, Umhlanga Manors, 4021
COMPILED REPORT	Ms M. Shabalala
SIGNED	
DATE	
REVIEWED REPORT	Mr Sheldon Singh
SIGNED	
DATE	
DATE SUBMITTED	

EXECUTIVE SUMMARY:

Hanslab (Pty) Ltd was appointed by KwaZulu-Natal Department of Transport (DOT) to undertake an Environmental Application for the proposed project. The KZN DOT (Applicant) proposes to upgrade the Mhlopeni mud track to a type 7A gravel road. The type 7A gravel road will be approximately 4.5 km in length & 6m in width with a road reserve of 20m which conforms to the DOT standards for local road upgrades. There are numerous drainage lines along the proposed route, therefore, the KZN DOT proposes to construct multiple pipe culvert structures, a slab structure & a portal causeway structure to facilitate the natural flow of water within the channels. Drainage lines transverse the road at 90 degrees and follows the natural contours of the surrounding landscape leading into the adjacent low-lying Mhlopeni river.

The Draft BAR includes the project description & the description of the receiving environment. The purpose of this *Draft* BAR is to provide the relevant stakeholders opportunity to assess possible impacts that may arise from the proposed development. All the issues raised will be addressed in the Final BAR.

According to the risk rating matrix, after all significant impacts were taken into consideration & rated individually, the preferred route is said to have a **low environmental significance rating**. Most impacts are short term, local in extent, some site specific, not intense in its effect and may not be likely to occur. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedures.

DETAILS OF EAP & SPECIALISTS

Table 1: indicating EAP Details

EAP	Experience	Contact Details
Mr S. Singh Environmental Specialist	14 Years	Hanslab (Pty) Ltd Tel: (031) 563 1978 Cell: 072 455 5168 E-mail: sheldon@hanslab.co.za

SECTION A: ACTIVITY INFORMATION

PROJECT TITLE

The proposed upgrade of a mud track to a Type 7A gravel road & appropriate structures along Ntabenzima mud track within Umvoti Local Municipality.

PROJECT DESCRIPTION

The KwaZulu-Natal Department of Transport (the applicant) proposes to upgrade Ntabenzima mud track to a Type 7A Gravel road. The upgrade will be approximately 5.5 km in length, 6 m in width with a road reserve of 20m which conforms to the DOT standards for local road upgrades. In total, the proposed route transverses 6 drainage lines. The applicant (KZN DOT) proposes to construct pipe culvert structures & a portal causeway structure within the points at which the drainage lines intercepts the proposed route to allow for the natural flow of water. The construction of the pipe culverts & portal causeway structure within the crossings forms the focus of the basic assessment report, and triggers a listed activity as outlined below.

Two alternative designs for the pipe culvert structures have been outlined below and will be assessed within the Draft BAR:

- Design Alternative 1:** Precast concrete pipe culvert and associated headwalls;
- Design Alternative 2:** Concrete piped culvert with stone pitched/ gabion headwalls;

One alternative has been investigated for the proposed portal causeway structure and assessed within the Draft BAR:

- Alternative 1:** Portal Causeway structure;

The listed activities below are triggered according to the EIA Regulations of 2014 (Listing Notice 1, GNR 983)

- **Listing Notice 1 of 2014, Listed Activity 12:**

The development of –

(iii) bridges exceeding 100 square meters in size;

(xii) infrastructure or structures with a physical footprint of 100 square metres or more.

where such development occurs-

(i) within a watercourse.

DESCRIPTION OF THE ACTIVITY TRIGGERING LISTED ACTIVITY 12

The Department of Transport (DOT) proposes to construct several pipe culverts and a portal culvert causeway structure along the drainage lines & major water crossing point respectively, as indicated on Map 1 below. The physical footprint of the proposed structures will be greater than a 100 square metres therefore the activity 12 is triggered.

- **Listing Notice 1 of 2014, Listed Activity 19:**

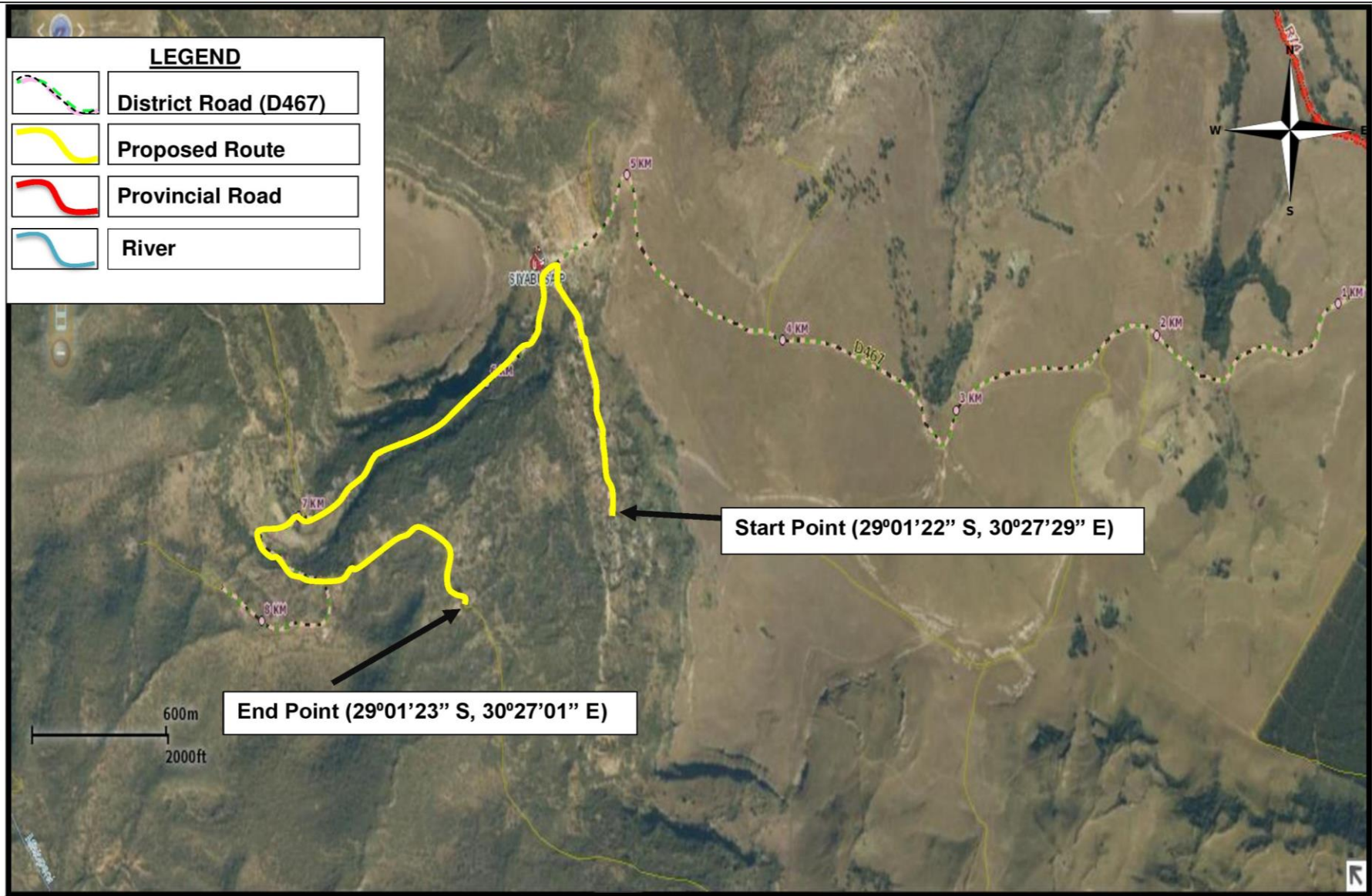
The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from -

(i) a watercourse;

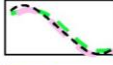
DESCRIPTION OF THE ACTIVITY TRIGGERING LISTED ACTIVITY 19

The proposed activity will require the temporary removal of soil from the watercourse and drainage lines for the proposed construction of the structures. **Approximately 7 m³** of soil will be removed from the water crossings collectively to allow for construction. The beds and banks of the stream will also be modified during the

construction phase, to allow for the linking/re-alignment of the upgraded local road to the structures.



LEGEND

-  District Road (D467)
-  Proposed Route
-  Provincial Road
-  River

Start Point (29°01'22" S, 30°27'29" E)

End Point (29°01'23" S, 30°27'01" E)

600m
2000ft

MAP 1: AERIAL VIEW OF PROPOSED ROUTE

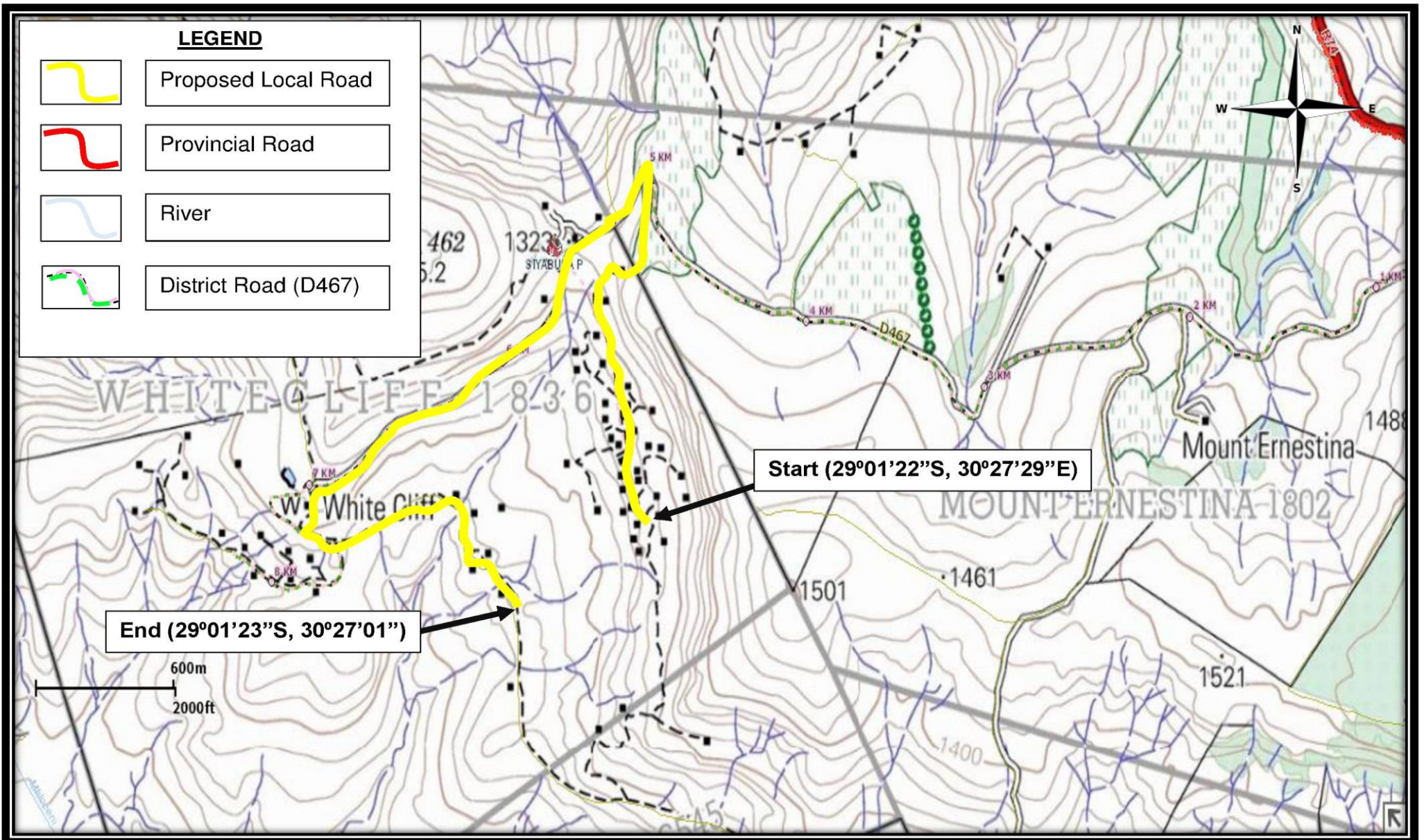
FEASIBLE & REASONABLE ALTERNATIVES

Site Alternative

The proposed construction of the causeway structure & pipe culverts will take place along a point that has already been disturbed. The river banks have become prone to erosion, and inundated during periods of high rainfall. There are no site alternatives with respect to the position/location of the causeway structure & pipe culverts as the existing Ntabenzima Mud Track transverses the watercourse at this specific crossing point, furthermore the existing crossing point has been utilized by the community members & livestock over many years, which has become prone to soil degradation.

Table 2: Showing the location of the proposed structures:

Location of the pipe culverts, & causeway structure:	Latitude (DDMMSS)	Longitude (DDMMSS)
Drainage Line 1	29°01 '01" S	30°27 '24" E
Drainage Line 2	29° 00' 57" S	30°27 '21" E
Drainage Line 3	29°01 '06" S	30°27 '05" E
Drainage Line 4	29°01 '26" S	30°26 '44" E
Drainage Line 5	29°01 '24" S	30°26 '48" E
Drainage Line 6	29°01 '23" S	30°27 '00" E



Map 2: Locality Map of Proposed Route

Technology Alternatives

The Department of Transport proposes to construct a portal causeway within the watercourse and pipe culverts within the drainage lines. One design alternative has been investigated for the proposed portal causeway structure. Two design alternatives have been investigated w.r.t. the culvert structure:

- i) precast pipe culverts with associated precast headwalls;
- ii) and a concrete piped culvert with stone pitched/ gabion headwalls.

- **Portal Culvert Causeway Structure**

Based on DOT standard details for a portal culvert causeway the approximate width is 8.45 m and length is 7.4 m which varies in relation to the stream width. The physical footprint of the structure is $> 100 \text{ m}^2$. The causeway structure will be supported on pad foundation founded on bedrock. Refer to Appendix C.1 for the facility illustration.



Photograph 1: showing example of a portal causeway structure.

- Pipe culvert structure

Alternative 1 - Precast Concrete Pipe Culvert with precast Headwalls (Option 1):

Figure 1 below depicts an example of the preferred technology to be implemented within the drainage lines. 600mm Diameter, class 100D pipes of 2.44m lengths spanning, covered by a minimum of 150mm compacted back-fill material will be constructed in the drainage lines. Concrete head-walls will be installed on the inlet and outlet sides of the culverts. Refer to Appendix C.2. for facility design. The preferred alternative has been considered as the best practical option by the applicant, as it has a longer life span, and much more cost effective to install and maintain. This option is the best environmental option as it will not require no formwork and no cement mixing on site thereby minimising spillages on site.



Photograph 2: Showing a concrete pipe culvert structure with headwalls.

Alternative 2: Concrete piped culvert with stone pitched/gabion headwalls (Option 2):

The second option will be to construct concrete pipe culverts with gabion or stone pitched headwalls within the drainage line. Stone pitching as it applies to road and construction is uniform sized stone placed shoulder to shoulder on a prepared surface. The stones used must be sound, tough, durable and clean and are normally sourced

from rock quarries. These are placed on cement with the spaces between stones filled with cement. The gabions are recommended in areas where stability is required. This option will be considered based on specific site conditions and the site engineer will advise accordingly during the site assessment and construction phase (**Refer to Appendix C.3 for Facility Design Drawings/layout**).



Photograph 3: Showing stone pitched pipe culverts with headwalls.

NO-GO ALTERNATIVE

No portal causeway and pipe culvert structures will be constructed, therefore there will be no negative impacts associated with the construction activity. However, there will also be no positive impacts associated with the road construction, for instance, enhanced connectivity and access for the local community. Community members that utilize the road will continue to experience disruptions, with regards to gaining access to the roads in the event of floods occurring. Difficulty will be experienced when access is frequently overtopped by flood water, making access impossible at times of high flow. Erosion along the road is evident in areas as a direct result of poor drainage along the existing mud track. The banks along the track are highly eroded due to poor drainage and inadequate storm water control structures. According to the ward councilor, members of the community are left stranded throughout periods of intense

rainfall as the existing mud track becomes inaccessible. There is no formal crossing structure, therefore no public transport can be accessed by the community members. The proposed route is transformed by existing footpaths and highly degraded to the extent that gully formation has become pronounced in the immediate site area. Most of the natural vegetation is at risk of becoming replaced by invasive alien vegetation.

PHYICAL SIZE OF THE ACTIVITY

Alternative:

**Size of the activity –
Causeway Structure**

- Alternative A1¹ (preferred activity alternative)
- Alternative A2 (if any)
- Alternative A3 (if any)

	>100 m ²
	N/A m ²
	N/A m ²

Alternative:

**Size of the activity –
Pipe Culvert Structure**

- Alternative A1² (preferred activity alternative)
- Alternative A2 (if any)
- Alternative A3 (if any)

	<50 m ²
	<50 m ²
	N/A m ²

LOCALITY MAP

A locality map serves as a tool to provide a visual representation of information in a geographical context. **Refer to Appendix A.2**

LAYOUT OR ROUTE PLAN

The site plan has been prepared for the proposed route upgrade and no alternative route has been investigated as the preferred route is being upgraded along the existing mud track as it has already been degraded. **Refer to Appendix A.1**

SITE PHOTOGRAPHS

Refer to Appendix B

FACILITY ILLUSTRATION

A detailed illustration has been provided and attached as an Appendix to the report. **Refer to Appendix C.1** for the portal causeway structure. **Refer to Appendix C.2** for the precast concrete pipe culvert and headwalls as well as **Appendix C.3** for stone pitched headwalls for the proposed pipe culvert structure.

ACTIVITY MOTIVATION

1. Is the activity permitted in terms of the property's existing land use rights?	YES X	NO	PLEASE EXPLAIN
<p>The propose upgrade will be located off R74 along Ntabenzima mud track (extended from D467), providing access to the local communities, and school children. The proposed causeway, and pipe culverts will be constructed to ensure safe access to pedestrians and motorists, whilst minimizing soil erosion and siltation of the watercourse due to runoff. This activity is in line with the property's existing land use rights and does not constitute a change in land use.</p>			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES X	NO	PLEASE EXPLAIN
<p>According to the SDF (2013), there are main roads, District & Provincial roads in the area. The general quality of these roads are in good condition, except the access routes which are found in the rural areas. The Greytown region is predominately rural and access to basic developmental areas & settlements is limited. Development in this area will create opportunities and unlock new development. Therefore, the activity is in line with the PSDF.</p>			
(b) Urban Edge/Edge of Built environment for the area	YES X	NO	PLEASE EXPLAIN
<p>The proposed upgraded is not in a built urban environment thus urban edge policies are not affected.</p>			
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES	NO X	PLEASE EXPLAIN
<p>According to the IDP (2014-15) rural roads and infrastructure requires more attention, as they are unsurfaced and prone to erosion. The municipality currently does not have storm water control measures. It was highlighted in the IDP (2014-15), that focus needs</p>			

to be on storm water management as well as the monitoring of settlement establishment on areas which are adjacent to rivers & streams (Umvoti IDP,2014/2015, p117). Therefore, the activity is in line with both the IDP and SDF of the local municipality.

(d) Approved Structure Plan of the Municipality	YES X	NO	PLEASE EXPLAIN
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The ward councillor has expressed the communities' concerns with regards to the need for crossing structures and proper road that is not inundated during high rainfall periods. Therefore, the activity is in line with the approved structure plan of the municipality. However, project is not funded by the local municipality but rather by the KZN Department of Transport.

(e) An Environmental Management Framework (EMF)	YES	NO X	PLEASE EXPLAIN
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According to the uMzinyathi District Municipality Draft EMF (2016), the objective of the mitigations and environmental practice is to enhance natural resources for sustainable equitable use, to protect and enhance the quality as well as the safety of the environment. Promoting the conservation and sustainable utilization of our resources to enhance economic growth, and protecting and improving the quality and safety of the environment. Therefore, no existing environmental management priorities for the area will be compromised, as the activity will contribute to the EMF.

(f) Any other Plans (e.g. Guide Plan)	YES	NO X	PLEASE EXPLAIN
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N/A

3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES X	NO	PLEASE EXPLAIN
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The SDF aligns itself with the new national priorities as its underlying principles are based on sustainable development planning strategies; access routes as investment lines; a service centre strategy; integration; meeting land use needs and identification

of areas of economic development potentials; restructuring of the local municipality (Umvoti SDF, 2013).

<p>4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)</p>	<p>YES X</p>	<p>NO</p>	<p>PLEASE EXPLAIN</p>
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Community members are often left stranded during periods of high rainfall; therefore, the upgrading of the mud track and construction of the crossing structures will impact positively to members of the community. During the construction process, local labour will be sourced (required/rooted) by the contractor, thus offering skilled training opportunities to members of the community. As a result of the construction process, employment will increase. It is therefore, a high societal priority for local community members.

<p>5) Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?</p>	<p>YES X</p>	<p>NO</p>	<p>PLEASE EXPLAIN</p>
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All necessary services are available for the activity to commence.

<p>6) Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)?</p>	<p>YES</p>	<p>NO X</p>	<p>PLEASE EXPLAIN</p>
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No infrastructure planning is envisaged by the municipality with regards to this project. The project costs are borne by the Department of Transport.

<p>7) Is this project part of a national programme to address an issue of national concern or importance?</p>	<p>YES</p>	<p>NO X</p>	<p>PLEASE EXPLAIN</p>
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The proposed activity is site specific and is at a localized level.

8) Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)

YES

X

NO

PLEASE EXPLAIN

The site is degraded and banks along the existing water crossing point are highly eroded as a direct result of poor drainage. The natural vegetation of the site has been interrupted and removed by human activities. On completion of construction, the site will be rehabilitated. Therefore, the location factors are favourable to this activity.

9) Is the development the best practicable environmental option for this land/site?

YES

X

NO

PLEASE EXPLAIN

The proposed site has been assessed & a favourable position for the causeway structure & pipe culverts has been identified with all stakeholders. Therefore, the development is the best practical environmental as well as engineering option.

10) Will the benefits of the proposed land use/development outweigh the negative impacts of it?

YES

X

NO

PLEASE EXPLAIN

The proposed construction of the causeway, slab & pipe culvert structures will positively impact the local community by providing access to basic amenities, and minimizing the negative impact of flooding, and soil erosion. The proposed construction will outweigh the negative impacts in terms of increased socio-economic development for the local community.

11) Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?

YES

NO

X

PLEASE EXPLAIN

No precedent will be set in the area. However, the construction of the causeway will improve accessibility for community members; and minimize erosion and storm water run-off. This will also encourage public transport in the area and quick response to emergency services.

12) Will any person's rights be negatively affected by the proposed activity/ies?	YES	NO X	PLEASE EXPLAIN
During the Public Participation Process no person expressed the view that the proposed activity will directly affect them, all stakeholders fully supported the project proposal. No dwellings will be relocated as the existing track does not transverse any properties and does not infringe on the rights of the residents.			
13) Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	YES	NO X	PLEASE EXPLAIN
The project is in a rural area, and therefore the urban edge is not affected.			
14) Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	YES	NO X	PLEASE EXPLAIN
This is a localized site specific activity, and will benefit the local community members.			
15) What will the benefits be to society in general and to the local communities?	PLEASE EXPLAIN		
<p>There is an urgent need to ensure safe and reliable means of crossing the water crossings for both vehicles and pedestrians. The construction of the causeway structure, slab and pipe culverts will also make travelling for basic amenities, education and work feasible for local community members. The crossing points are prone to flooding particularly during periods of high rainfall, thus limiting the access to basic amenities. Most of the population has no formal education and is illiterate. Most community members are dependent on governmental social grants, pensions and even informal trading to earn a living. Therefore, the development of this area is of great importance. The proposed action of upgrading the existing mud track can be considered as the first step towards upliftment or development of the local community. Once construction is complete the road will allow for public transport modes to cater for local communities efficiently. The proposed upgrade will contribute to the community in the following ways:</p> <ul style="list-style-type: none"> • Vehicles would not have to endure rugged terrain. • To encourage public transport within Mhlopheni Community • Travelling route distances would be decreased. • Will increase the safety of the people within the community. 			

- Improve access for Emergency services such as ambulance, SAPS, mobile clinics etc.
- Safe travel to all road users across the water crossings.
- Encourage economic development of the communities and 'unlocking land' for housing and farming.

16) Any other need and desirability considerations related to the proposed activity?

PLEASE EXPLAIN

As per the IDP (2014-15) there is a critical need to improve infrastructure within the local municipality. The area is predominately rural and developmental initiatives are limited with regards to funding. The Department of Transport has funded the project and similar projects within the District. Communities expressed their eagerness for the project, as they are of the view that the Government is taking their concerns of development seriously.

17) How does the project fit into the National Development Plan for 2030?

PLEASE EXPLAIN

The National Development Plan for 2030 sets out strategic goals in terms of access to basic services and amenities. Although this project is site specific in nature, it contributes to the cumulative effect of developmental nodes of rural communities to the urban environments.

18) Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been considered.

According to Section 23 of NEMA the appropriate environmental management tools were applied effectively. The EAP is an independent person, appointed by Nankhoo Engineers to determine all negative and positive impacts that may result from the proposed development. Mitigation measures were also proposed in this report. All the information compiled by the EAP was rated in a scoring matrix, taking environmental, social and ecological issues into account. The Draft BAR will be circulated into the public domain for a Public Participation Process as described in NEMA. All comments received during the entire Basic Assessment process will be recorded as part of the "Issues and Responses Report" and addressed accordingly in the final BAR. All impacts with regards to the proposed development were identified in and included as Section D of the report. The impacts that have been identified must be managed and mitigated.

These measures have been included in the Draft Environmental Management Programme (EMPr) attached as **Appendix F of this report.**

19) Please describe how the principles of environmental management as set out in section 2 of NEMA have been considered.

Section 2 of NEMA encourages environmental management that places people and their needs at the forefront of its concern, to be able to meet their physical, developmental, cultural and social interests. Taking this into consideration the communities will therefore be able to access basic amenities always because of the proposed development. Economically, the proposed activity will ensure that communities gain access to the school and allow easy access for potential investments. All factors mentioned in Section 2 (4) of NEMA were taken into consideration, assessed and discussed in Section D. Through Section 2 of NEMA it is understood that the principles as set out in this section have been considered through the proper application of a Basic Assessment Process as described by NEMA, and by assessing the predicted and actual impacts of the proposed activity to assist the Competent Authority in adequately making an informed decision. Section D of the Draft BAR addresses possible impacts such as land and water pollution, ecological disturbances, noise and socio-economic impacts as required by NEMA as well as possible mitigation measures. This will aid in sustainable development.

APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

a) NEMA and the Environmental Impact Assessment Regulations, 2014

The EIA Regulations 2014, promulgated under NEMA (1998), focus primarily on creating a framework for co-operative environmental governance. NEMA provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by State Departments and to provide for matters connected therewith.

b) National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.

This Act is applicable to this application for environmental authorisation, in the sense that it requires the project applicant to consider the protection and management of local biodiversity.

c) National Heritage Resources Act, 1999 (Act No. 25 of 1999)

This Act legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 hectares (ha) and where linear developments (including roads) exceed 300 metres in length. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by AMAFA KwaZulu-Natal, the Provincial Heritage Resources Authority.

d) Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)

To provide for the health and safety of persons at work and for the health and safety of persons about the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or about the

activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith.

e) Constitution of Republic of South Africa (Act No 108 of 1996)

The project falls within the boundaries of South Africa. The Constitution of the Republic of South Africa has major implications for environmental management. The main effects are the protection of environmental and property rights, the change brought about by the sections dealing with administrative law, such as access to information, just administrative action and broadening of the locus standing of litigants. These aspects provide general and overarching support and are of major assistance in the effective implementation of the environmental management principles and structures of the NEMA. Section 24 in the Bill of Rights of the Constitution specifically states that:

Everyone has the right -

- To an environment that is not harmful to their health or well-being; and
- To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -
- Prevent pollution and ecological degradation;
- Promote conservation; and
- Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Waste, effluent, emission and noise management

- Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES X	NO
> 5m ³	

If YES, what estimated quantity will be produced per month?

How will the construction solid waste be disposed of (describe)?

All solid waste accumulated during construction will be kept in designated area and will be disposed at the registered local landfill site weekly. This has been addressed in the EMPr (**Appendix F**). The ECO will audit the EMPr and submission will be made to the CA for review.

Where will the construction solid waste be disposed of (describe)?

The construction solid waste will be disposed of at the nearest registered landfill dump site located on Dundee Road (R33) by the contractor. This has been addressed in the Draft EMPr. The ECO will audit the EMPr and submission will be made to the CA.

Will the activity produce solid waste during its operational phase?

YES	NO x
N/A m ³	

If YES, what estimated quantity will be produced per month?

- **Liquid effluent**

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO X
-----	---------

Will the activity produce any effluent that will be treated and/or disposed of on-site?

N/A m ³	
YES	NO X

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO X
-----	---------

- **Emissions into the atmosphere**

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?

YES	NO X
-----	---------

If YES, is it controlled by any legislation of any sphere of government?

YES	NO X
-----	---------

- **Waste permit**

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM: WA?

YES	NO X
-----	---------

- **Generation of noise**

Will the activity generate noise?

YES X	NO
----------	----

If YES, is it controlled by any legislation of any sphere of government?

YES	NO
-----	----

	X
--	---

Describe the noise in terms of type and level:

Noise will only be generated during the Construction Phase only (machinery, generator etc.) The level of the noise is however low and below 70 decibels threshold limit. No noise will be generated during the operational phase; the impact is short-term and can be minimised with affective monitoring and auditing conducted by ECO.

- **Water use**

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

				Other	
Municipal	Water board	Groundwater	River, stream, dam or lake	Water will be transported to site via water tanks.	The activity will not use water

Water will be transported to the site via water trucks as to minimise strain placed on the local municipal system, and no water will be abstracted from any watercourse during the construction phase of the project.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Property Description

Table 3: Property Description

Province	KwaZulu-Natal
District Municipality	UMzinyathi District Municipality
Local Municipality	Umvoti Local Municipality
Ward Number(s)	Ward 11
Farm name and number	Whitecliff 1836
Portion number	3 & 4
SG Code	NOFT01250000183600000
	NOFT01250000183600003
	NOFT01250000183600004

GRADIENT OF THE SITE

Alternative S1:

Existing Track

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
			X			

Drainage line

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
		X				

Alternative S2 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

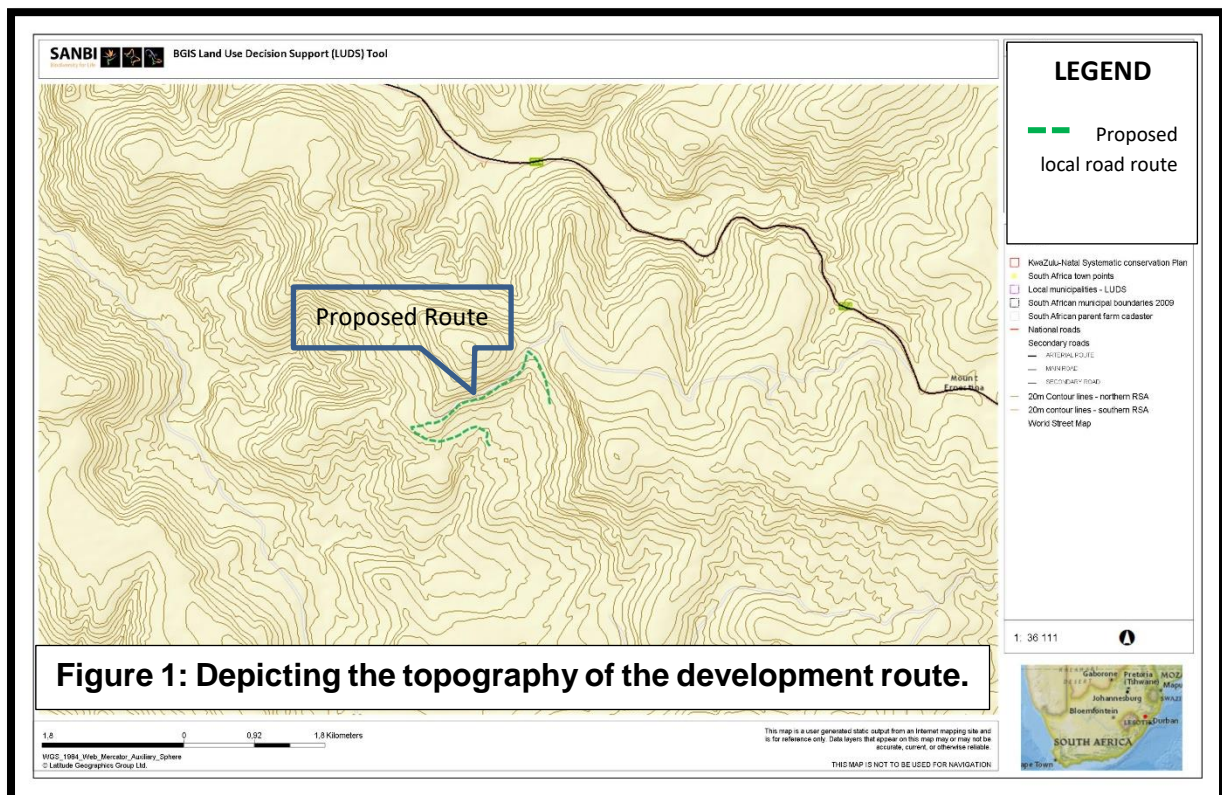
Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Baseline Biophysical Conditions

1. Topography

The topography is undulating, although some areas are steeper than others. Umvoti Local Municipality has the lowest altitude point being 145m above sea level and the highest being 1614m above sea level. UMzinyathi District area is characterised by extensive variation with deep river gorges, rolling grasslands, extensive wetlands, hills and valley bush veld. The District can be divided into three topography areas, the northern plateau with the Biggarsberg and the Buffalo River valley dominating the landscape; the southern landscape defined by the mountains immediately North of Greytown and the Mvoti River valley; and the prominent Thukela River valley, into which the valleys carved by the Buffalo and Mooi Rivers feed into, which is characterised by deep gorges and steep slopes (Umvoti Municipality IDP, 2015-2016).



2. Vegetation

The most dominant vegetation types in the UMzinyathi District are: the midlands Mistbelt grassland in the southern parts of the district around Greytown Thukela valley bushveld; Thukela thornveld in the central parts; KwaZulu-Natal highland thornveld in the North-eastern parts of the district & income sandy grassland in the northern parts. The indigenous forest patches are mainly concentrated in the southern and eastern parts of the Umvoti municipality. The densest stands of trees are limited to afforested areas (plantations), which are not regarded as ecologically sensitive due to the drawdown effect they have on the water table (Umvoti IDP, 2015-2016).

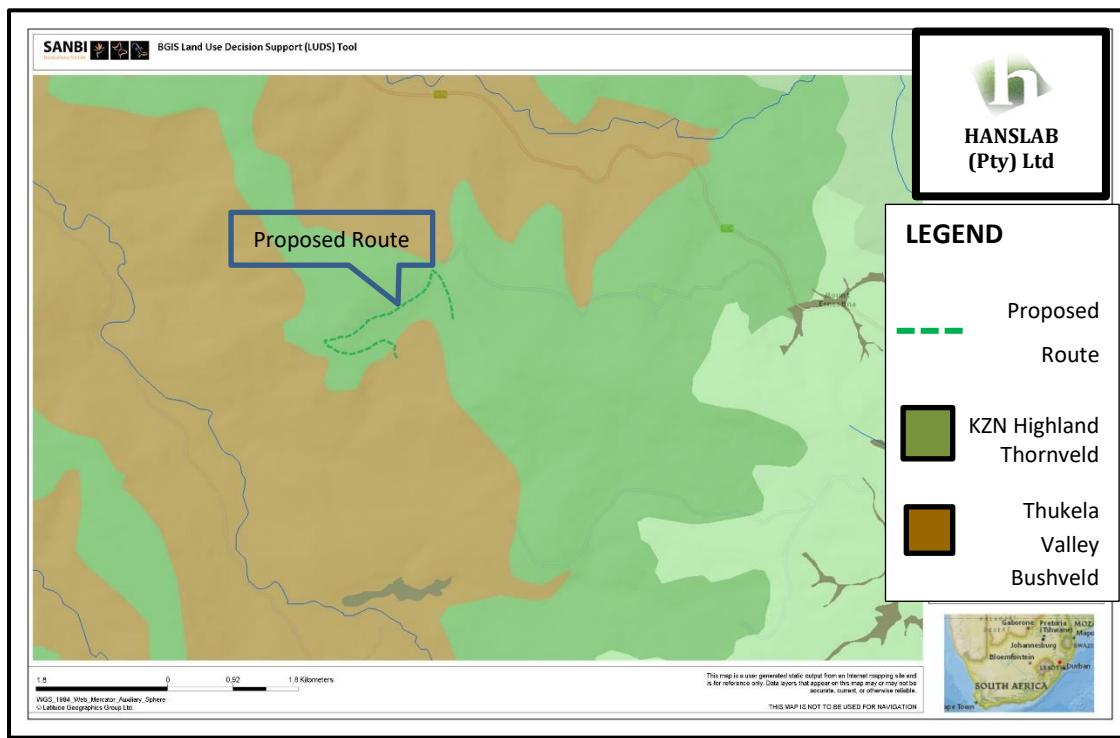


Figure 2: Showing vegetation types within the development route.

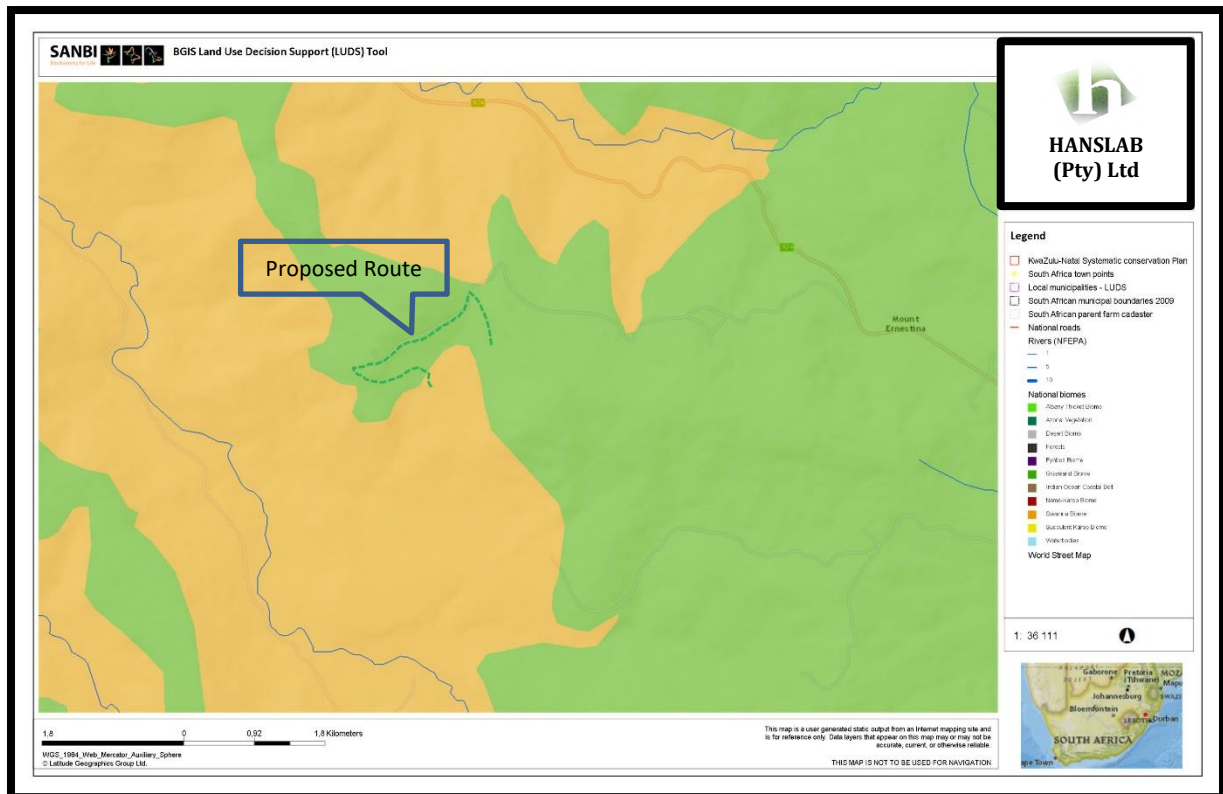


Figure 3: Showing biomes dominating the development route.

3.Geology

The development area is dominated by undifferentiated shallow soils, with Lithosols which are shallow soils on hard or weathering rock. These is a group of shallow **soils** lacking well-defined horizons, especially an entisol consisting of partially weathered rock fragments, usually on steep slopes. These types of soil are closely linked to the dominance of grassland and savanna vegetation. (SANBI LUDS data)

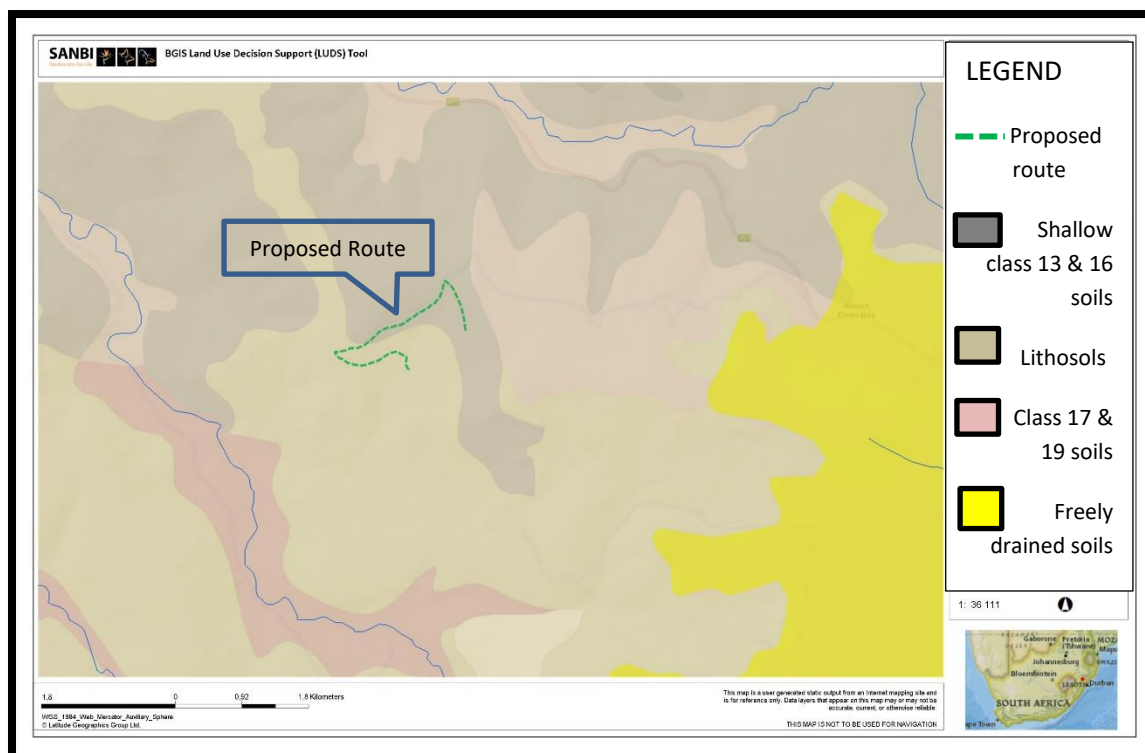


Figure 4: showing soil classes of the development route.

4. Climate

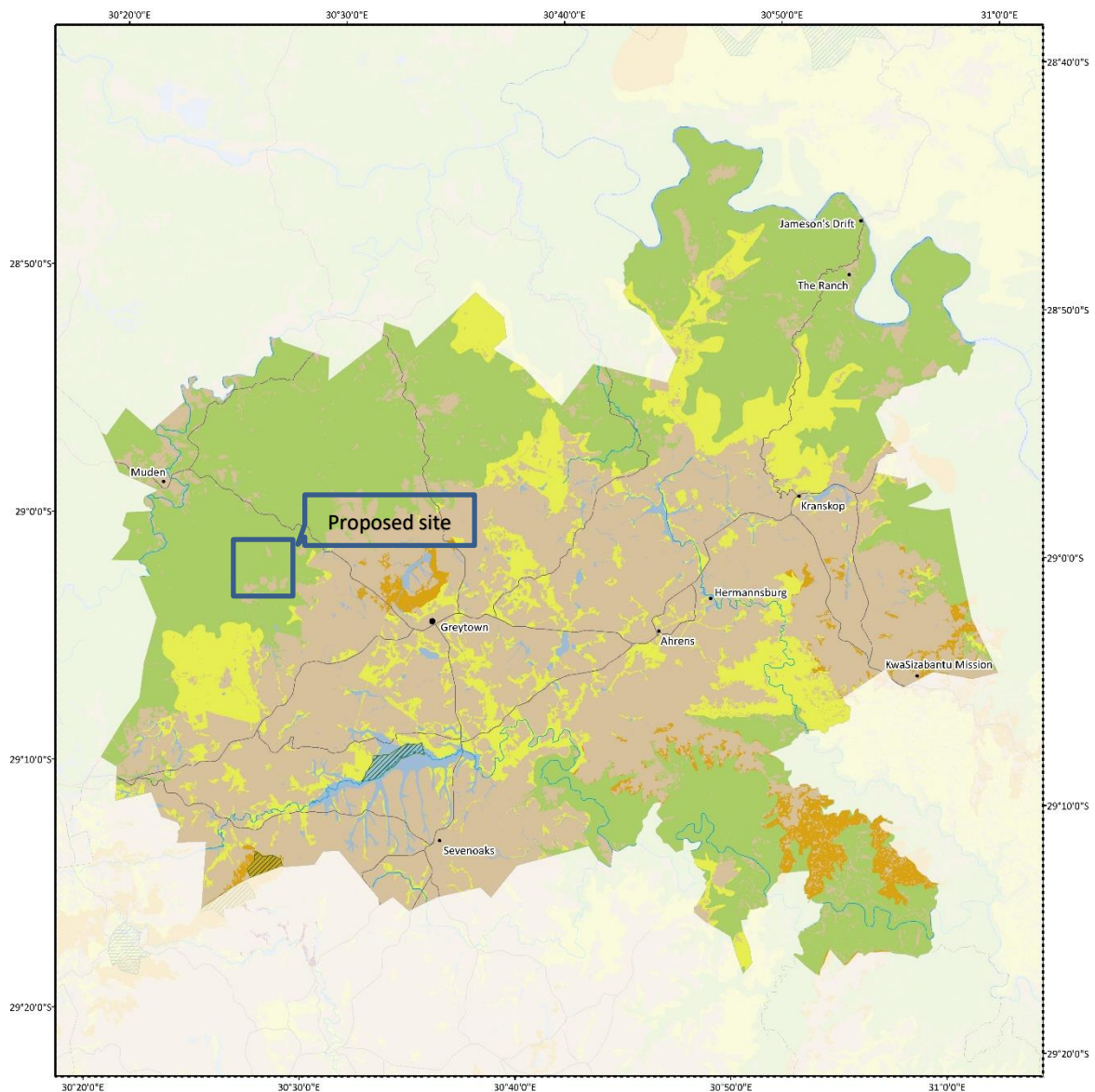
Umvoti has a temperate climate. Temperate climates are those without extremes of temperature and precipitation (rain and snow). The changes between summer and winter are generally invigorating without being frustratingly extreme. Rainfall varies from more than 800mm in Umvoti and Endumeni, to less than 400 mm in parts of Msinga. Precipitation is primarily associated with summer thunderstorms, which can be accompanied by strong winds and hail. Temperature averages range from a minimum of 2°C in winter to a maximum of 23°C in summer, with an average of 14°C (Umvoti Municipality IDP, 2015- 2016).

5. Biodiversity

During the site investigation, existing footpaths and overgrazing were observed and the site has been transformed, therefore the proposed activity will contribute to the rehabilitation of the site which has been outlined in the Draft EMP. According to the SANBI data it can be understood that the proposed causeway & drainage lines for pipe culverts on the site lie within areas where no natural habitat remains, and if any are remaining they are least threatened.

Municipality:
UMVOTI,
KwaZulu-Natal

**Terrestrial
Biodiversity
Summary Map**



LEGEND

PROTECTED AREAS

- Land-based Protected Area (formal)
- Land-based Conservation Area (informal)
- Ramsar Site

TERRESTRIAL ECOSYSTEMS

Threatened Terrestrial Ecosystems

- Critically Endangered
- Endangered
- Vulnerable
- Least Threatened

} Areas Remaining Natural

Areas Where No Natural Habitat Remains

FRESHWATER ECOSYSTEMS

- Rivers
- Wetlands

OTHER

- Major Town
- Towns
- Roads



0 5 10 15 Kilometers

environmental affairs
Department of Environmental Affairs
REPUBLIC OF SOUTH AFRICA

For more information contact:
Biodiversity GIS (BGIS)
South African National Biodiversity Institute (SANBI)
Tel: (021) 799 8738 OR
Email: bgishelp@sanbi.org

Disclaimer: The Municipal Biodiversity Summary Project uses data generated as of December 2009 and is based on the best available national spatial layers. Finer-scale biodiversity information is available for some municipalities and, if available, should be considered in land-use planning and decision-making within the municipality.

Figure 5: showing the biodiversity summary of the development route, SANBI.

6. Land use character of surrounding area

Natural area	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station ^H
Medium density residential	Schools (Mount Ernestina Combined; Combined; Primary)	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential ^A (Rondavels & Mud huts adjacent to the route)	Church	Agriculture (Commercial & Subsistence farming)
Retail commercial & warehousing	Old age home	River, stream
Light industrial	Sewage treatment plant ^A	Nature conservation area
Medium industrial ^{AN}	Train station or shunting yard ^N	Mountain, ridge
Heavy industrial ^{AN}	Railway line ^N	Museum
Power station	Major road (4 lanes or more) ^N	Historical building
Office/consulting room	Airport ^N	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam ^A	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses (describe)

7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:

YES	NO
Uncertain	

Draft BAR to be lodged with AMAFA. Awaiting AMAFA comments.

Will any building or structure older than 60 years be affected in any way?

YES	NO
YES	NO

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

mm

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Umvoti Local Municipality is one of four municipalities in the UMzinyathi District Municipality, KwaZulu-Natal. The municipality is situated along the eastern boarder of UMzinyathi District, about 65 km from Dundee and approximately 70 km from Pietermaritzburg. It covers an area of approximately 2 516 km² and is well served by provincial and regional roads, easily accessible from Pietermaritzburg, the coast, Drakensberg, and the battlefields route. According to Census 2011, 53.5% of individuals in the municipality live in formal dwellings. 94.6% of the 103 093 people in the municipality are Black African, with the White and Coloured populations each contributing 2.2%.

There are 27 282 households in Umvoti Local Municipality, with an average of 3.7 people per household. Nearly 57.6% of households are headed by females, and the proportion of households residing in formal dwellings is 53.5%. In terms of service delivery, 20.2% of households have access to piped water within the dwelling, and 23.4% of households have a flush toilet that is connected to a sewerage system. 58.3% of households have access to electricity for lighting.

Level of unemployment:

According to the SDF (2013), the Umvoti local municipality has experienced a steady decline in unemployment rates since 1996. In 1996 the unemployment rate was recorded at 49.8% this has significantly dropped to 30.4% in 2011. The general prediction trend is translated to a reduction of an average of 1.6% year on year. 30.4% of the 24 047 economically active individuals (i.e. those who are employed or unemployed but looking for work) are unemployed. Of the 13 160 economically active youth (15–34 years) in the municipality, 38.0% are unemployed.

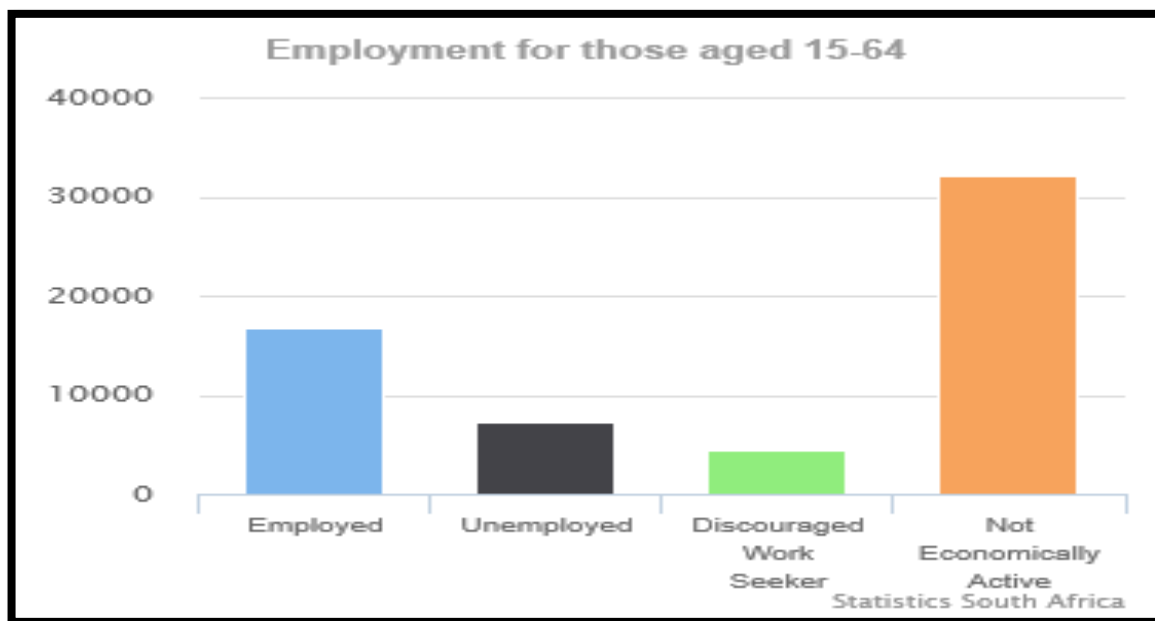


Figure 6: Representing the employment rate in Umvoti by age.

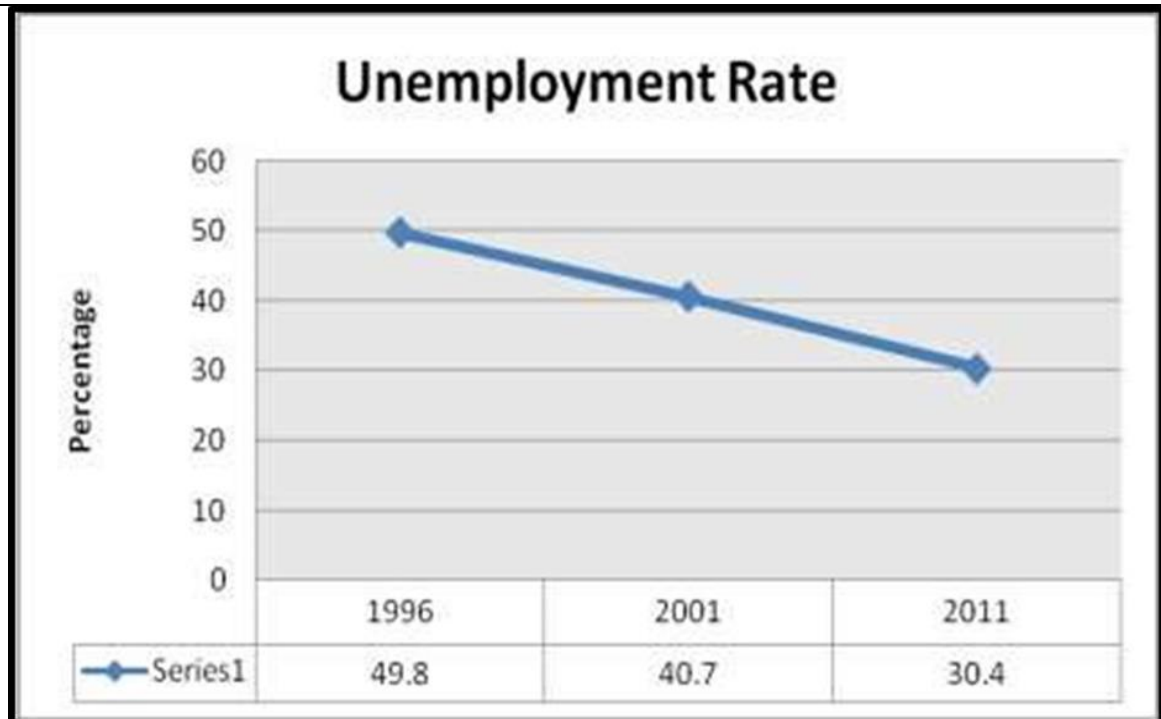


Figure 7: Representing Unemployment Rate in Umvoti SDF, 2013

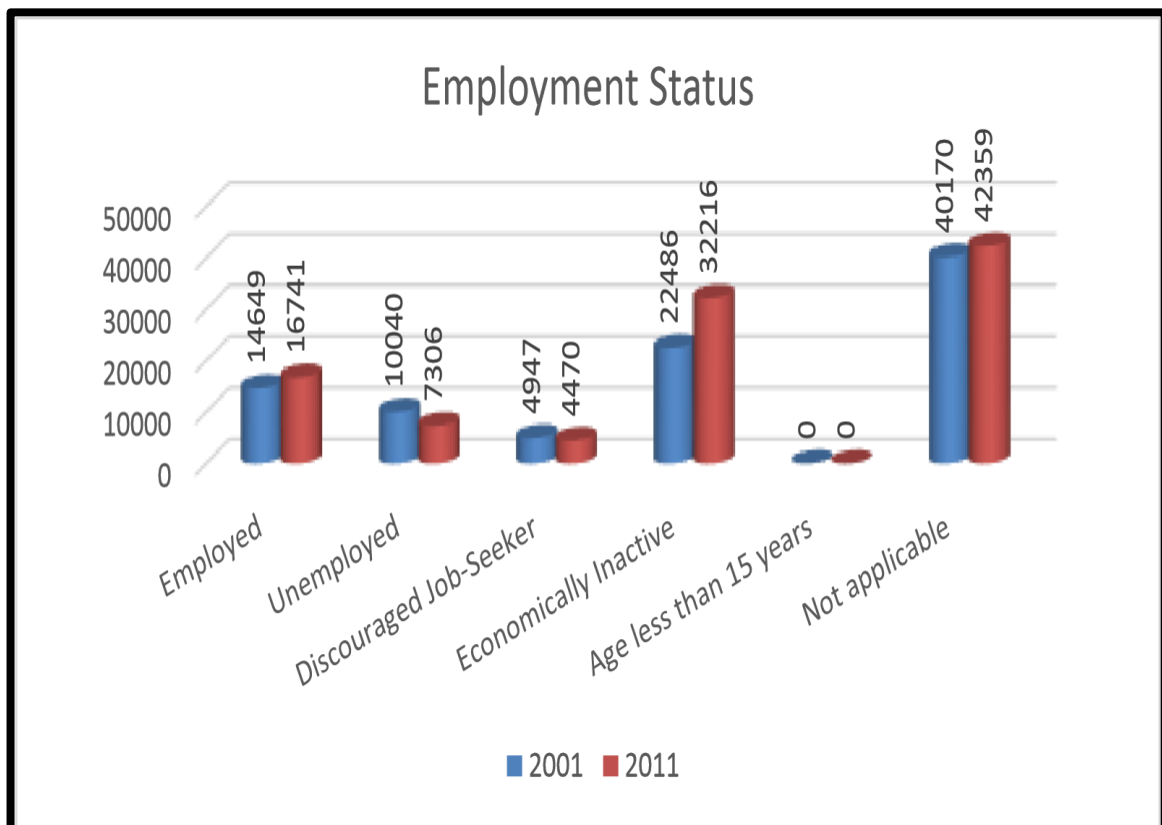


Figure 8: Representing Umvoti Employment Status IDP, 2014

Economic profile of local municipality:

The Umvoti Local Municipality has well known sectors of economic development, which contribute or drive the economic growth of the area. General government services, wholesale and retail trade, manufacturing and agriculture as well as forestry have been major contributors in the economy. Greytown is the main provider of higher income jobs in senior management, professional, technical, clerks as well as skilled personnel. Commercial farms provide most of the skilled jobs and are provided through processing plants. It should be noted that Traditional Authority areas provide few to no jobs at all (IDP, 2014-2015).

Good agricultural potential is found in the Greytown area and along Umvoti River arising from a combination of high rainfalls, moderate temperatures, good soils and moderate slopes. Moderate agricultural potential is concentrated in the area between Greytown and Kranskop, but large patches are scattered throughout the area, where productivity is adversely affected by difficult topography, acidic soils, high hail tendencies and population pressure. The carrying capacity of the veld is high in summer, but poor during the winter months. Soil erosion & leaching of soils is a recurring problem as a combination of Poor Land-Use Practices, Heavy Overgrazing

& Poaching coupled with steep gradients have led to the degradation of wetlands, soil fertility & an overall reduction in the agricultural productivity of the area.

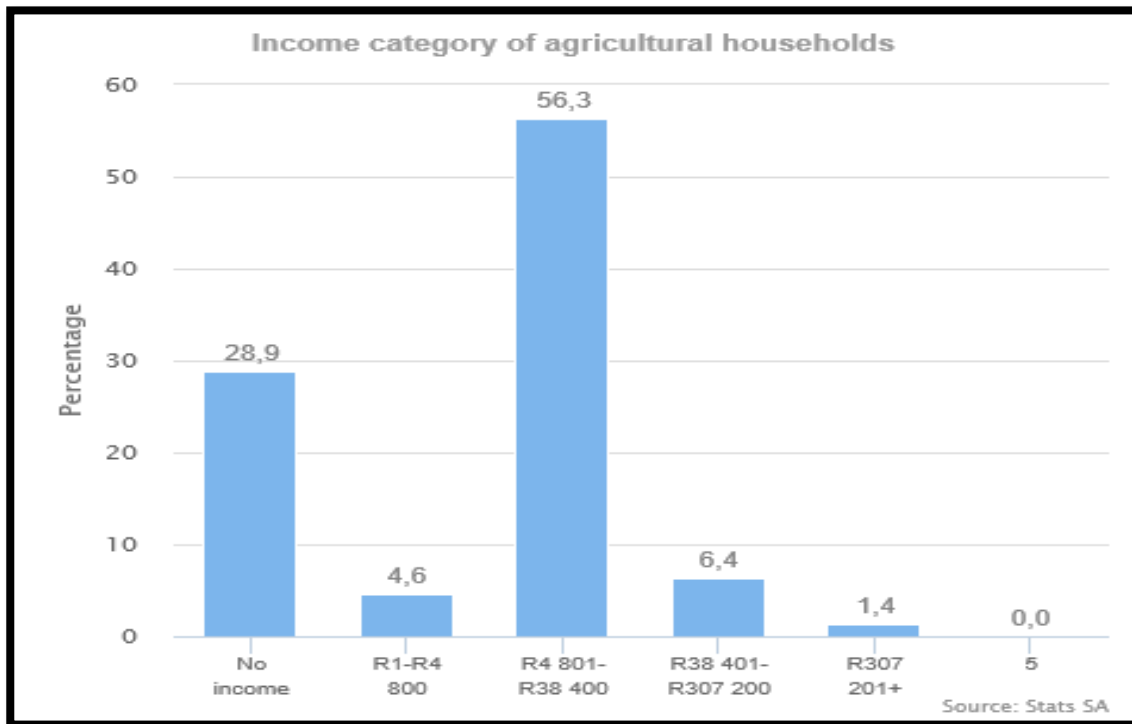


Figure 9: Representing the income generated by each household with their agricultural produce to sustain their families (Stats SA, 2011).

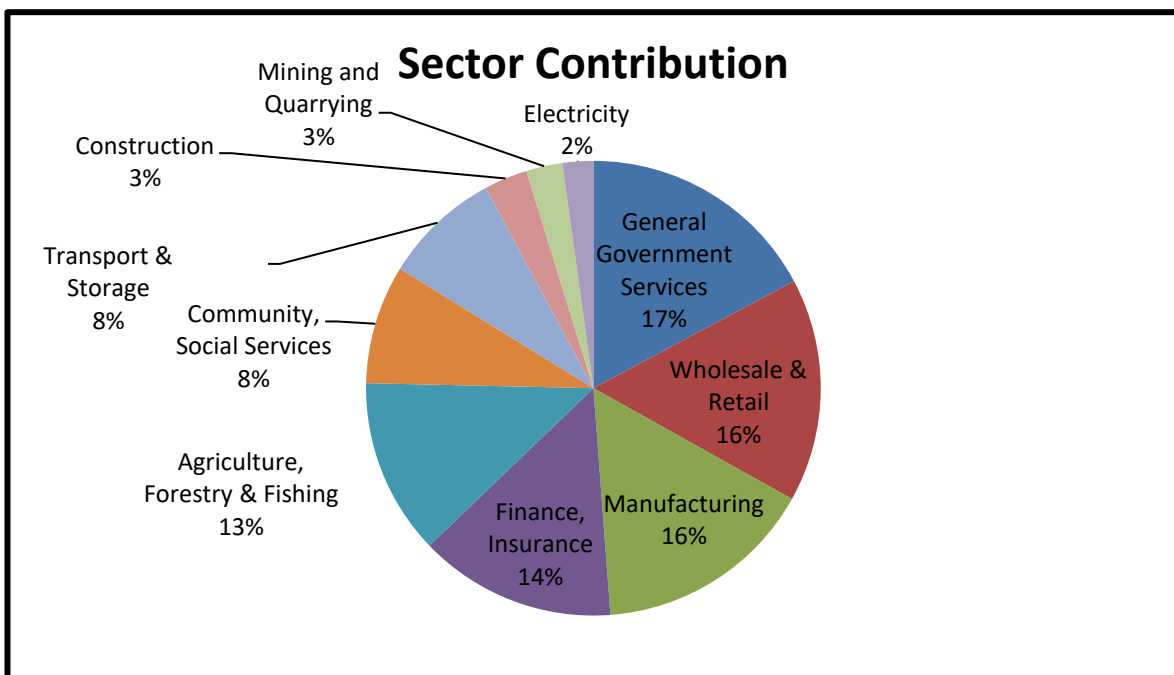


Figure 10: Representing the economic contributors by sector in the Umvoti municipality.

Level of education:

According to the census 2011 only 26.6% of those aged 20 and above have had no schooling, while 1 in 4 individuals (25.3%) in this age group have some secondary education, 22.8% have completed matric, and 4.8% have some form of higher education.

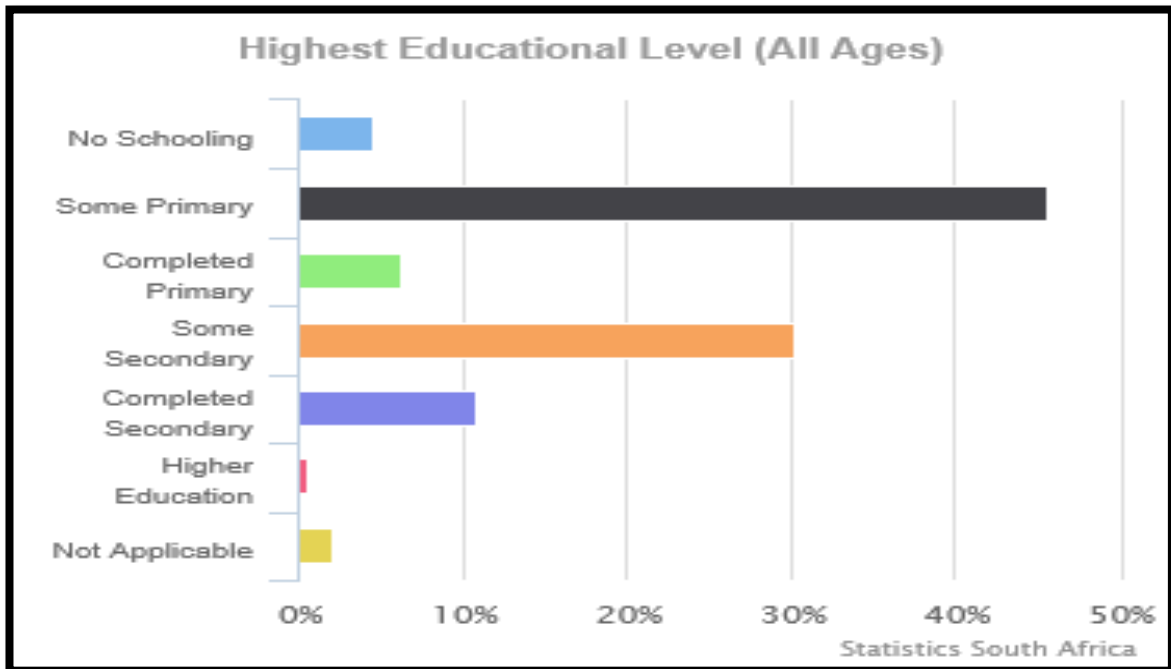


Figure 11: Showing the education levels of Umvoti Municipality (Stats SA, 2011).

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R 2.5 million	
What is the expected yearly income that will be generated by or as a result of the activity?	R N/A	
Will the activity contribute to service infrastructure?	YES X	NO
Is the activity a public amenity?	YES X	NO
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	20	

What is the expected value of the employment opportunities during the development and construction phase?

R 800 000

What percentage of this will accrue to previously disadvantaged individuals?

100 %

How many permanent new employment opportunities will be created during the operational phase of the activity?

N/A

What is the expected current value of the employment opportunities during the first 10 years?

N/A

What percentage of this will accrue to previously disadvantaged individuals?

100 %

SECTION C: PUBLIC PARTICIPATION

1. Advertisement and Notice

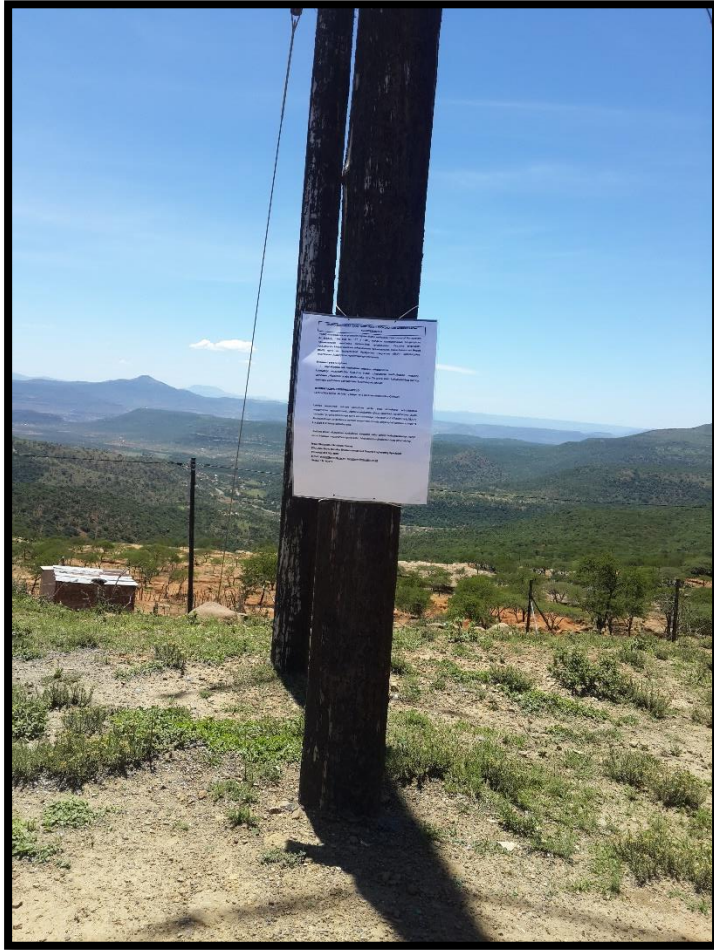
Table 4: Showing the Newspaper Advertisement to inform Interested & Affected Parties (I&AP's)

Publication name	Greytown Gazette	
Date published	23/11/2016	
Site notice position	Latitude	Longitude
	29°01 '17" S	30°27 '28" E
	29°00 '51" S	30°27 '22" E
Date placed	17/11/2016	

2. Determination of appropriate measures

2.1 Site Notices

On the 17th of November 2016 two site notices were placed at strategic points along the Mhlopeni mud track in for public viewing (**Refer to Appendix E**). This forms part of the Public Participation Process and provides members of the local community the opportunity to register as Interested and Affected Parties (I&AP's). As I&AP's the community members can express their concerns with regards to the proposed causeway structure & pipe culverts. To date no comments have been received and no individuals have registered as I&AP's.



Photograph 4: Showing site notice place along the proposed route.

2.2 Newspaper Advertisement

A newspaper article was published on the Greytown Gazette on the 23rd of November 2016. The newspaper articles forms part of the Public Participation Process and affords the public the opportunity to register as Interested & Affected Parties (I&AP's). I&APs can voice their relevant concerns with regards to the proposed new causeway structure & drainage lines. To date no comments have been received & no individuals have registered as I&AP's.

Missing man sought

Eighteen-year-old Khanyisani Nicholas Mlambo is missing. He was last seen at Zakwe's store in Rietvllei on Saturday 5 November. Anyone with any information is asked to call Detective Constable S.C. Mncwabe of the Rietvllei SAPS on 079 679 2728.



A stroke? Take fast action

WORLD Stroke Week began on 28 October running until 3 November and ER24 is urging people to educate themselves about the condition.

Stroke is a common and serious condition affecting millions of people around the globe.

A stroke, which could lead to death or disability, occurs when blood flow to parts of the brain is cut off.

There are two types of stroke. The most common is the ischemic stroke, which occurs when a blood vessel supplying blood to part of the brain becomes blocked by a blood clot which could either form in an artery in the brain or travel to the brain through a blood vessel from another part of the body.

The second less common, but more likely, fatal type of stroke, is the hemorrhagic stroke, which occurs when a blood vessel in the brain leaks or bursts and/or ruptures causing bleeding.

Recognising the signs of a stroke early and seeking urgent medical assistance are of utmost importance as it increases the person's chances of survival and recovery.

If you suspect you or someone else is having a stroke, conduct the fast test as follows:

• **Face** – is one side of the person's face drooping? The person should smile or show their teeth.

• **Arm** – the person should keep their arms raised for a few seconds. If one arm drifts down or is weak, they could be having a stroke.

• **Speech** – the person should try to speak. If there is slurring or if the person struggles to understand or repeat any sentence, they could be having a stroke.

• **Time** – if the person experiences any of the above, call emergency services immediately.

Immediate and appropriate care can improve a patient's outcome. Strokes can be reversed if treated before the affected brain tissue dies.

Hypertension, or high blood pressure, is the leading cause of strokes (and heart attacks) in South Africa. Hence, it is vital that you get your blood pressure measured regularly.

Risk factors for stroke also include diabetes, high cholesterol, smoking, excessive alcohol intake, heart disease and stress.

It is vital that people live a healthier lifestyle to reduce chances of having a stroke. Quitting smoking, reducing alcohol intake, making the right food choices (such as reducing salt and sugar intake), and including moderate exercise into your daily routine, can make a positive difference.

ER24

Xmas cakes with a difference

THIS is world-famous TV star, Mary Berry's recipe. She became famous as one of the stars of the *Great British Bake Off*.

Make this delectably moist and fruity cake as an alternative to traditional Christmas cake. It serves 12.

• 350g red glacé cherries, rinsed, dried and cut into quarters

• 225g tinned pineapple in pineapple juice, drained, dried and roughly chopped

• 50g dried apricots, chopped

• 100g blanched almonds, roughly chopped

• 2 lemons, finely grated zest only

• 350g sultanas

• 250g unsalted butter, softened, plus extra for greasing

• 250g castor sugar

• 5 large free-range eggs, lightly beaten

• 250g self-raising flour

• 75g ground almonds

For the topping

• small handful blanched whole almonds

• small handful walnut halves

• 50g whole orange peel (available from health-food shops), cut into pieces

• 100g apricot jam

Method:

• Preheat the oven to 160C/320F. Grease a deep, 23cm/9in round cake tin with butter, then line the base and sides with a double layer of baking parchment.

• In a bowl, gently mix together the cherries, pineapple, apricots, almonds, lemon zest and sultanas until well combined. Set aside.

• In a food processor, cream the butter and sugar until light and fluffy. Pour in the beaten eggs a little at a time, adding a spoonful of the flour to prevent the mixture from curdling and pulsing after each addition.

• Carefully fold the remaining flour and ground almonds into the cake mixture using a metal spoon, then gently fold in the fruit and nut mixture until just combined.

• Pour the cake mixture into the prepared tin and smooth the surface using a palette knife.

• For the topping, decorate the cake with the blanched whole almonds, walnut halves, glacé cherry halves and orange peel.

• Bake the cake in the oven for 2-2½ hours, or until golden-brown on top and cooked through. (The cake is cooked through when a skewer inserted into the centre of the cake comes out clean.) Cover the cake loosely with tin foil after one hour to prevent the top from becoming too dark.

• Set the cake aside in its tin to cool for 30 minutes, then remove from the tin, peel the baking parchment away from the sides and place onto a wire rack to cool completely.

• Meanwhile, heat the apricot jam in a small pan over a low heat, then strain through a fine sieve to remove any pieces of fruit. When the cake has cooled, brush

the top all over with the warm apricot jam. Wrap a ribbon around the cake and tie with a bow, if desired, then serve.

Simmer 'n stir cake

An easy-to-make alternative to traditional Christmas cakes, which requires no baking.

Ingredients

175g chopped almonds

200g dark muscovado sugar

750g luxury mixed dried fruit (one that includes mixed peel and glacé cherries)

finely grated zest and juice of 1 orange

finely grated zest of 1 lemon

100ml cherry brandy or brandy plus 4 tbsps more

85g macadamia nut

3 large eggs

lightly beaten

85g ground almond

200g plain flour

½ tsp baking powder

1 tsp ground mixed spice

1 tsp ground cinnamon

¼ tsp ground allspice

Method

• Put the butter, sugar, fruit, zests, juice and 100ml brandy in a large pan. Bring slowly to the boil, stirring until the butter has melted. Reduce the heat and bubble for 10 minutes, stirring occasionally.

• Remove the pan from the heat and leave to cool for 30 minutes.

• Meanwhile, preheat the oven to 150°C and line a 20cm round cake tin.

• Toast the nuts in a dry frying pan, tossing them until evenly browned, or in the oven for 8-10 minutes - keep an eye on them as they burn easily. When they are cool, chop roughly.

• Stir the eggs, nuts and ground almonds into the fruit mixture and mix well. Sift the flour, baking powder and spices into the pan. Stir in gently, until there are no traces of flour left.

• Spoon the mixture into the tin and smooth it down evenly - you will find this is easiest with the back of a metal spoon which has been dipped into boiling water.

• Bake for 45 minutes, then turn down the heat to 140°C and cook for a further 1-1½ hours the top of the cake with foil if it starts to darken too much. To check the cake is done, insert a fine skewer into the centre - if it comes out clean, the cake is cooked.

• Make holes all over the warm cake with a fine skewer and spoon the extra 4 tbsps brandy over the holes until it has all soaked in. Leave the cake to cool in the tin.

• When it's cold, remove it from the tin, peel off the lining paper, then wrap first in baking parchment and then in foil.

• The cake will keep in a cupboard for up to three months or you can freeze it for six months.

Mary Cadogan, BBC.

ISAZISO SOKUBAMBA IQHAZA KOMPHEKATHI NGOKOMQHUBO WOKUGUNYAZWA NGOKWEZEMVELO

Endaweni yase-Greytown:

Umyango WezokuThutha Kwa-Zulu Natal uphakamisa ukuthuthukisa:

- Umgwaqo wendawo Odadani
- Umgwaqo wendawo uMhlopheni
- Umgwaqo wendawo uNtabenzima

Isaziso sibanikizela umphakathini ngokomthetho weNational Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), njengoba kwakuchibiyelwe. Ukugunyazwa ngokwezemvelo kuzofuneka kulazinkontilaki eziphakanyiswe. Kwaziswa umphakathi ngokuthinteka kwawo kulesisicelo sokugunyazwa ngokwezemvelo.

IBasic Assessment Report (BAR) kanye ne Environmental Management Programme (EMPr) kuzothunyelwa kuyoholelwa ukugunyazwa ngabomnyango ngabezemvelo. Lezinkontileka zithinta uActivity 12 kanye no19 weGovernment Notice GNR983.

Umhlozi wezemvelo ozimele usaqoqiwe ukuba enze lomsebenzi wokubhalisela ukugunyazwa ngokwezemvelo. Abafuna ukubamba iqhaza kuloluhelelo bayaminyaka ukuba babhalise njengabathakaselayo kanye nabathintekayo. Interested and Affected Party (I&AP). Abathakaselayo bangabhalisa kumhlozi wezemvelo ozimele zingapheli izinsuku ezingu-14 kusukela kukhishwe lesisikhangiso.

Ukuthola ulwazi olungeziwe ngokufakwa kwegama lakho ohlwinini lwabathakaselayo kanye nabathintekayo, ungathumela igama lakho, ikheli nalapho utholakala khona uthumele ku:

Mbali Shabalala / Uvishkaar Sumer

Umhlozi wezemvelo: Hanstab Environmental and Ground Engineering Specialist

P.O. Box 2135, Umlhlanga Manors, 4021

Ehhovisi: 031 563 1978

E-mail: mbali@hanstab.co.za / uvishkaar@hanstab.co.za

PLEASE NOTE
DEADLINE
FOR GAZETTE
CLASSIFIEDS
IS MONDAY, 10 am
033 413 2735

Figure 12: Showing proof of Ad published on the Greytown Gazette.

2.3 Meeting with Ward councillor

A formal meeting was held on the 17th of November 2016. Present at the meeting was the Ward councillor (Mr Dlamini) of Ward 11. The meeting served to inform parties regarding the construction of the proposed causeway & pipe culverts. A formal letter was then presented to the ward councilor outlining the nature of the proposed development. Thereafter the ward councilor signed the formal letter confirming that he was made aware of the proposed development. (Refer to **Appendix E.2** for acknowledgement letter). The elected structures that currently exist were chosen to be the most appropriate means of informing community members of the proposed development.

All organs of state that were identified during the process were informed and requested to comment on the Draft Basic Assessment Report (BAR), comments have been included as **Appendix E** of the Draft BAR.

3. Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 983:

Table 5: Key Stakeholders

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Mr Dlamini	Ward Councillor	072 621 7577

3.1 Issues raised by Interested and Affected Parties

Summary of main issues raised by I&APs	Summary of response from EAP
No concerns have been raised by the local community, other than the lack of formal access to all amenities. The ward councillor is in favour of the proposed upgrade. The Induna expressed the urgency for the causeway	Responses have been included in the Appendix D entitled 'Comments Received'

structure as community members cannot cross the watercourse during periods of high rainfall.	
--	--

4. COMMENTS AND RESPONSE REPORT

REFER TO **APPENDIX E.1** FOR SUMMARY OF COMMENTS

5. AUTHORITY PARTICIPATION

Table 6: Authorities and organs of state identified as key stakeholders:

AUTHORITY/ ORGAN OF STATE	CONTACT PERSON (TITLE, NAME AND SURNAME)	TELEPHONE	E-MAIL	POSTAL ADDRESS
Department of Transport	Ms. S. Ndlela	034 299 8600	sibongile.mhlungu@knztransport.gov.za	Private Bag X2002 Dundee 3000
AMAFA	Ms B. Pawandiwa	033 394 6543	bernadetp@amafapmb.co.za	P.O. Box 2685 PMB 3201
KZN Wildlife	Mr D Wieners	033 845 1999	Dominic.Wieners@kznwildlife.com	P.O. Box 13053 3202
Department of Water & Sanitation	Mr S. Govender	031 336 2759	GovenderS2@dwa.gov.za	88 Field Street Durban 4001
Department of Economic Development, Tourism & Environmental Affairs (DEDTEA)	Mr G. Willis-Smith	034 299 9679	gerald.willis-smith@kznedtea.gov.za	P.O Box 125 Dundee 3000

SECTION D: IMPACT ASSESSMENT

IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

N.B All mitigation measures have been outlined in specific detail in the EMPr (**Appendix F**); therefore, this section must be read in conjunction with the EMPr. The impacts that have been outlined below relate to the construction of a causeway. The proposed causeway construction will also be constructed along an existing crossing which has already been disturbed by human activities. It is not feasible to construct the causeway at a “new crossing point” since this will have adverse negative impacts to the surrounding environment.

1.1 Selection of Site

The selection of the causeway crossing point will have the greatest environmental impact. The proposed causeway will be constructed along an existing crossing point with footpaths that have been developed over the years and in the same position as the existing culverts. Therefore, the existing crossing point has been selected as the preferred alternative to prevent further disturbance to the environment. Engineering Designs prepared by Nankhoo Engineers has taken the most efficient techniques with minimal impact to the environment into consideration.

Risk Assessment

Risk Assessment Methodology

The following presents the assessment criteria used to evaluate the impacts resulting from the proposed development.

IMPACT ASSESSMENT METHODOLOGY

The impacts that may result from the construction phase and operation phase of the project was assessed according to a number of criteria to arrive at an overall significance rating. The criteria used were as follows:

Ranking Scales for Environmental Risk Assessment

Probability Rating (P)

Rating	Probability
5	Definite
4	High Probability
3	Medium Probability
2	Low Probability
1	Improbable
0	None

Duration Rating (D)

Rating	Duration
5	Permanent
4	Long term (ceases with operational life)
3	Medium Term (5-15 years)
2	Short-term (0-5 years)
1	Immediate

Scale Rating (S)

Rating	Scale
5	International
4	National
3	Regional
2	Local
1	Site
0	None

Magnitude Rating (M)

Rating	Magnitude
10	Very High
8	High
6	Moderate
4	Low
2	Minor

After each impact is rated according to the ranking scales above, the **environmental significance** of each impact could be assessed by applying the following formula:

$$SP = (\text{MAGNITUDE (M)} + \text{DURATION (D)} + \text{SCALE(S)} \times \text{PROBABILITY (P)})$$

Where SP is defined as significance points. The maximum value of significance points (SP) is 100. Environmental effects could therefore be rated as either high (H), moderate (M), or low (L) significance is based on the following:

Rating	SP
>60 Points	High Environmental Significance (HES)
30-60 Points	Moderate Environmental Significance (MES)
<30 Points	Low Environmental Significance (LES)

Proposed upgrade of Ntabenzima mud track in Greytown, within the Umvoti District Municipality.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
			Scale	Duration	Probability	Magnitude	Significance Points (SP)
1. SOIL EROSION							
1.1 Erosion of stockpiled material Stockpiled materials include topsoil, gravel and stone. Top soil is the uppermost layer of soil, and has the highest concentration of organic matter. Top soil is responsible for the growth and support of vegetation and the lives of microorganisms. Erosion is likely to occur because of inappropriate stockpiling methods. Therefore, applying the suitable mitigation measures to this impact is imperative.	Direct impact						
		Before Mitigation	Local	Immediate	Definite	High	MES
			2	1	5	8	55
		After Mitigation	Local	Immediate	Medium	Low	LES
		2	1	3	4	21	

Mitigation Measures:

- Once an area has been cleared of vegetation, the top layer (nominally 150mm) of soil should be removed and stockpiled in a designated area.
- Stockpiles must not surpass 2 meters in height unless otherwise permitted by the engineer.
- Topsoil should only be exposed for minimal periods of time and adequately stockpiled to prevent the topsoil loss and run-off.
- Stockpiles must be covered if exposed to intense weather conditions such as wind and rain, and must not be allowed on or near steep slopes.
- Topsoil must be kept separate from overburden and must not be used for building purposes or maintenance or access roads.
- Stockpiles may further be protected by the construction of berms or low brick walls around their bases.
- Stockpiles must be at least 50m away from a watercourse, to prevent erosion.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F**.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
1. SOIL EROSION							
<p>1.2 Increased potential for erosion along the watercourse and banks resulting in the sedimentation.</p> <p>Construction activities including excavations and vegetation clearing, expose soil to environmental factors including rainfall and wind. Exposure to these factors may result in the removal of topsoil and subsequently soil erosion and deposition of sediment into the watercourse. The increased high-suspended particulate matter will accumulate within the watercourse affecting the functional integrity of the watercourse system, thereby, reducing the ecological integrity of the surrounding areas.</p> <p>The risk and potential impact will be high during the construction phase.</p>	Indirect impact	Before Mitigation	Site	Short-term	Definite	High	HES
			1	2	5	8	55
		After Mitigation	Site	Immediate	Medium	Low	MES
			1	1	3	6	24

Mitigation Measures:

- Effective rehabilitation of the development footprint as well as the implementation of erosion control measures is imperative to mitigate the above risks.
- The causeway structure must be designed to avoid excessive ponding at the inlet which will cause accumulation of floating debris, culvert clogging, and alterations to the hydrological and geomorphologic processes which govern the wetland. The culvert and stormwater pipelines designs must be preferably wider than the channel width. Undersized culverts constrict the stream flow and become perched, causing soil erosion downstream of these structures.
- Erosion protection measures can include using energy dissipaters to slow the velocity of water coming from the causeway structure in the following methods:
 - ❖ Erosion control measures must be implemented in areas sensitive to erosion and where erosion has already occurred such as edges of slopes, exposed soil etc. These measures include but are not limited to - the use of sand bags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes.
 - ❖ Vegetation clearing within 50m of the watercourse and associated riparian zone must only be undertaken when construction activity is underway at this point and this area must be rehabilitated within 2 weeks of initial clearing occurring. The entire construction area must not be stripped of vegetation prior to commencing construction activities.
 - ❖ The banks of the water crossing point will be affected with the construction of the causeway structure. This must be re-profiled as per the original soil horizon structure and re-vegetated with indigenous grasses and trees.

- ❖ Install sediment barriers across the entire construction right-of-way immediately upslope of the riparian boundary at the water crossing point to prevent sediment flow into the watercourse.
- ❖ Erosion protection measures must be installed at the causeway structure or any stormwater drainage pipes' outlets located along the route. This is in addition to velocity control measures.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F**.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating
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1.3 During construction the removal of vegetation and excavation increases the probability of the exposed soil being eroded by rain and wind.	Direct impact		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
		Before Mitigation	Site	Short-term	High	Very High	MES	
			1	2	4	10	52	
		After Mitigation	Site	Short-term	Low	Moderate	LES	
			1	2	2	6	18	

Mitigations

- Vegetation clearing must not be undertaken more than 10 days in advance of the work front.
- Vegetation clearing must be kept to a minimum and grass buffer strips must be implemented wherever possible at the development edge at the start of construction.
- Effective rehabilitation of the development footprint as well as the implementation of erosion control measures is imperative to mitigate the risks.
- These have been addressed in the attached EMPr.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
2. VEGETATION							
2.1 Spread of Alien invasive species The removal of vegetation within the proposed site will have a negative impact on the functionality of the vegetation community associated with the riparian zone system. This will make this largely natural area more susceptible to encroachment by invasive alien species and erosion.	Indirect impact						
		Before Mitigation	Local	Immediate	Definite	High	HES
			2	1	5	8	55
		After Mitigation	Site	Immediate	Medium	Low	MES
	1	1	3	4	18		

Mitigation Measures:

- An alien invasive management programme must be incorporated into an Environmental Management Programme.
- The Contractor should be responsible for implementing a programme of weed control (particularly in areas where the soil has been disturbed); and grassing any remaining stockpiles to prevent weed invasion
- Ongoing alien plant control must be undertaken after the construction phase and during the operational phase and particularly in the disturbed areas. Areas which have been disturbed will be quickly colonised by invasive alien species. An ongoing management plan must be implemented for the clearing/eradication of alien species.
- Disturbance to natural vegetation should be minimized as far as possible to limit opportunities for alien invasive plant species to become established
- Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge.
- Post-construction rehabilitation is essential to mitigate the negative impacts of construction activities and must be implemented as soon as possible.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F**.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
			Scale	Duration	Probability	Magnitude	Significance Points (SP)
2. VEGETATION							
2.2 Damage and removal of existing indigenous vegetation. A direct disturbance and loss of habitat and vegetation for various organisms, and the excessive loss of vegetation and trees because of unregulated vegetation clearance.	Direct impact	Before Mitigation	Local	Short-term	High	Moderate	MES
			2	2	4	6	40
		After Mitigation	Local	Immediate	Low	Low	LES
			2	1	2	4	14

Mitigation Measures:

- As the work front progresses the Contractor is to check that vegetation clearing has the prior permission of the Engineer.
- All indigenous vegetation must be marked and avoided as far as practically possible.
- Only trees that have NOT been marked beforehand are to be removed.
- Gathering of firewood, fruit, muthi-plants, crops or any other natural material on site or in areas adjacent to the site is prohibited.
- Immediate re-vegetation of stripped areas and removal of aliens by weeding must take place. This significantly reduces the amount of time and money that must be spent on invasive alien plant management during rehabilitation.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F**.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
			Scale	Duration	Probability	Magnitude	Significance Points (SP)
3. FAUNA							
3.1 Hunting, poaching by construction workers.	Direct impact	Before Mitigation	Local	Short-term	High	Moderate	MES
			2	2	4	6	40
		After Mitigation	Local	Short-term	Low	Low	LES
			2	2	2	4	16

Mitigation Measures:

- The hunting of birds and animals on site and in surrounding areas is strictly prohibited and workers must be instructed that hunting, poaching and fishing is a direct noncompliance of the authorized activity.
- Placing snares and traps on site and in surrounding areas are prohibited.
- Guidelines will be set out by the ECO during the construction phase, which must to be adhered to, to ensure that no possible impacts occur.
- The ECO will monitor such activities for non-compliance.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F**.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating						
			Scale	Duration	Probability	Magnitude	Significance Points (SP)	
4. IMPACTS ASSOCIATED WITH THE WATERCOURSE								
4.1 Modification of water flow and riverine dynamics of the watercourse.	Direct impact	Before Mitigation	Site	Permanent	High	Moderate	MES	
			1	5	4	6	48	
		After Mitigation	Site	Permanent	Low	Minor	LES	
			1	5	2	2	16	

Mitigation Measures:

- Site workers must be trained about the potential impacts associated with areas of high sensitivity, i.e. steep river/stream banks, wetlands.
- Edge hardening must be kept to a minimum. Design options should be investigated to minimise the alteration of the adjacent habitats to concrete environments, whilst taking into consideration the type of structure and materials utilised.
- Areas adjacent to the water crossing point which are occupied by indigenous vegetation species must be rehabilitated where hardened areas are evident. This must also include areas within the water crossing point that were cleared during construction.
- Paths created for movement of construction vehicles must be restricted to minimise the compaction of sediments.
- All imported or repositioned sediment and materials within the watercourse and along the banks must be removed. Once construction activities conclude all disturbed areas must be rehabilitated to its pre-construction condition, or an improved condition.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F**.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
4. IMPACTS ASSOCIATED WITH THE WATERCOURSE							
4.2. Construction activities such as excavation exposes soil to environmental factors such as wind and rain, this may increase sedimentation of the watercourse	Direct impact	Before Mitigation	Site	Long-term	High	Moderate	MES
			1	4	4	6	44
		After Mitigation	Site	Long-term	Low	Minor	LES
		1	4	2	2	14	

Mitigations:

- Install sediment barriers across the entire construction right-of-way immediately upslope of the drainage line to prevent sediment flow into the water bodies.
- Avoid construction activities that disturb soil during periods of expected heavy or lengthy rainfall.
- Preserve grassed areas and vegetation where possible. They help filter sediment from stormwater before it reaches the drainage system and stop rain turning exposed soil into mud.
- Other sediment control techniques include but are not limited to silt fences, rock check dams and fibre logs.
- All areas impacted by earth-moving activities must be re-shaped post-construction to ensure natural flow of runoff and to prevent ponding.
- Appropriate control mechanisms must be installed around all soil excavations to prevent soil from entering the minor water crossing point.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
5. HAZARDOUS SUBSTANCES							
5.1 Spillages Fuels and other chemicals stored on-site will negatively impact groundwater as a result of spillages. Mismanagement of waste and pollutants like hydrocarbons, construction waste and hazardous chemicals will result in these substances entering and polluting sensitive natural environments either directly through surface runoff during rainfall events, or subsurface water movement.	Direct impact						
		Before Mitigation	Local	Immediate	High	High	MES
			2	1	4	8	44
After Mitigation	Local	Immediate	Low	Moderate	LES		
	2	1	2	6	18		

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
5. HAZARDOUS SUBSTANCES							
5.1 Spillages continued... The linked nature of the watercourses will result in pollutants being carried downstream from the construction site having consequences on further downstream users including aquatic faunal species. An increase in pollutants will lead to changes in the water quality, affecting their ability to act as an ecological corridor in the larger landscape. Additionally, cement mixing/spillages on open ground pose a threat to the receiving environment.	Direct impact						
		Before Mitigation	Local	Immediate	High	High	MES
			2	1	4	8	44
		After Mitigation	Local	Immediate	Low	Moderate	LES
2	1		2	6	18		

Mitigation Measures:

- Every effort should be made to ensure that any chemicals or hazardous substances do not contaminate the soil or ground water on site
- All waste generated during construction is to be disposed accordingly and washing of containers, wheelbarrows, spades, picks or any other equipment adjacent to or in the watercourse is strictly prohibited.
- Temporary bunds must be constructed around chemical or fuel storage area that is outside 1:100 floodline of the drainage line.
- Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using correct solid/hazardous waste facilities
- Cement will be mixed off-site and construction vehicles kept at a distance from the drainage line
- Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area as soon after detection as possible to minimize pollution risk.
- Any contaminated soil must be removed and the affected area rehabilitated immediately
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F**.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (S)	
6. WASTE MANAGEMENT							
6.1 Improper storage and disposal of solid waste. Contamination of the surface and site with general waste. General waste produced on site includes: <ul style="list-style-type: none"> • Office waste (e.g. food waste, paper, plastic); • Operational waste (clean steel, wood, glass); and • General domestic waste (food, cardboards, paper, bottles, tins). 	Direct impact						
		Before Mitigation	Site	Short term	High	High	MES
			1	2	4	8	44
		After Mitigation	Site	Short term	Low	Moderate	LES
1	2		2	6	18		

Mitigation Measures:

- Sufficient bins or skips will be provided on site.
- Regular inspections and tidying will be done on site before workers are dismissed for the day so that the site will be tidy always.
- Recycling is to be encouraged by providing separate receptacles.
- This must be discussed daily during tool box talks
- Construction rubble shall be disposed of in pre-agreed, demarcated spoil dumps that have been approved by the Engineer for temporary storage, thereafter all rubble must be transported to a registered landfill site.
- The contractor will collect a certificate for disposal from the landfill site for record purposes.
- The ECO will ensure that such is adhered to during audits
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F**.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
6. WASTE MANAGEMENT							
6.2 Lack of appropriate sanitation facilities and improper disposal of toilet waste from chemical toilets resulting in the contamination of the surrounding environment and the watercourse.	Direct impact	Before Mitigation	Site	Short term	High	Moderate	MES
			1	2	4	6	36
		After Mitigation	Site	Short-term	Low	Minor	LES
		1	2	2	2	10	

Mitigation Measures:

- Adequate chemical toilets must be provided for all workers as standard construction practice. The acceptable ratio is 1 chemical toilet per 20 workers.
- The chemical toilets must be provided by a registered company and all effluent must be regularly disposed of at a licensed facility. Service certificates must be kept on record.
- Portable toilets must be placed outside of the 1:100-year flood line from streams or 30m away from the riparian zone, whichever is the greatest.
- Waste from chemical toilets should be disposed of regularly and in a responsible manner by a registered waste contractor. Care must be taken to avoid contamination of soils and water, pollution and nuisance to adjoining areas.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F**.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating						
			Scale	Duration	Probability	Magnitude	Significance Points (SP)	
7. NOISE QUALITY								
7.1 Noise disturbance. Residents near the proposed development site will be subjected to increased noise nuisance (noise and vibration caused by construction machinery and equipment) during the construction phase of the project.	Direct impact	Before Mitigation	Local	Short term	Definite	Moderate	MES	
			2	2	5	6	50	
								MES
		After Mitigation	Local	Short term	Medium	Minor	18	

Mitigation Measures:

- Construction machinery such as jackhammers, construction vehicles such as sand and water trucks loaded with stone and water tanks will create noise. Such noise will be generated in a discontinuous manner during the day only while the causeway construction is underway.
- Noise will only be generated during the construction phase (from operating machinery, generators etc.) and will only occur during the designated working hours (7:30 to 17:00) week days and closed during weekends, and must comply with the provisions of SABS 0400-1990 with respect to working hours.
- The level of the noise generated will be low and below 70 decibels threshold limit.
- Construction vehicles and machinery should be fitted with the appropriate noise muffling devices and must be appropriately maintained.
- No noise will be generated during the operational phase; therefore, the impact is short-term and can be minimised with affective monitoring and installing silencing equipment on all plant hire/machinery.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F.**

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
8. AIR QUALITY							
8.1 Dust generated as a result of construction activities and construction vehicles.	Direct impact	Before Mitigation	Local	Short term	Definite	Moderate	MES
			2	2	5	6	50
		After Mitigation	Local	Immediate	Medium	Low	LES
		2	1	3	4	21	

Mitigation Measures:

- The use of a water truck must be used to wet exposed road surfaces or stockpiled areas.
- The construction vehicles must adhere to a speed limit of 30km/hr to avoid excessive dust emission.
- Access and other cleared surfaces must be dampened whenever possible and especially in dry and windy/conditions to avoid excessive dust.
- Loads could be covered to avoid loss of material in transport, especially if material is transported off site.
- The dust levels must be kept below the required SANS standard to ensure minimal impact to the surrounding community and the environment.
- Suspend excavation during periods of high winds
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F**.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating						
			Scale	Duration	Probability	Magnitude	Significance Points (SP)	
8. AIR QUALITY								
8.2 Emissions from the exhaust fumes from construction vehicles.	Direct impact	Before Mitigation	Local	Short term	High	High	MES	
			2	2	4	8	48	
		After Mitigation	Local	Short term	Medium	Minor	MES	
			2	2	3	2	18	

Mitigation Measures:

- Vehicles are to be kept in good condition to minimise vehicular fumes.
- Should excessive emissions be observed, the Contractor must remove the vehicle from the site.
- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F**.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					Significance Points (SP)
		Scale	Duration	Probability	Magnitude		
9. VISUAL QUALITY							
9.1 General housekeeping on-site. Should appropriate housekeeping measures not be implemented by the contractor, this will have an adverse impact with respect to environmental aesthetics of the site.	Direct impact						
		Before Mitigation	Local	Immediate	Definite	Moderate	MES
			2	1	4	6	36
		After Mitigation	Local	Immediate	Medium	Low	LES
	2	1	2	4	14		

Mitigation Measures:

- If facilities such as toilets, bins, tanks and stockpiles are left uncovered or unfenced this could have a negative visual impact on the community as well as potentials visitors in the area and could pose a health and safety issue.

- The ECO shall regularly inspect the site to ensure that it is neat and clean. The site shall be kept visually and aesthetically pleasing, especially in and around the construction camp.

- A site-specific EMPr has been compiled to manage construction activities and is attached under **Appendix F**.

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
10. SOCIO-ECONOMIC							
10.1 Improved living standards The construction of causeway structures at crossing points provides access to basic amenities, thereby improving living standards. Positive impact noted therefore no mitigation required.	Direct Impact						
		Before Mitigation	Local	Long-term	Medium	N/A	LES
			2	4	3	N/A	N/A
		After Mitigation	N/A	N/A	N/A	N/A	N/A
N/A	N/A		N/A	N/A	N/A		

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
10. SOCIO-ECONOMIC			Scale	Duration	Probability	Magnitude	Significance Points (SP)
<p>10.2 Temporary employment for community members.</p> <p>The construction phase will be associated with positive socio-economic impacts as local labour will be sourced.</p> <p>A positive impact is noted; therefore, no mitigation is required.</p>	<p align="center">Direct impact</p>						
		Before Mitigation	Local	Long-term	Medium	N/A	LES
			2	4	3	N/A	N/A
		After Mitigation	N/A	N/A	N/A	N/A	N/A
			N/A	N/A	N/A	N/A	N/A

Impacts/Significance associated with the Construction Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating							
11. NO-GO ALTERNATIVE			Scale	Duration	Probability	Magnitude	Significance Points (SP)		
<p>11.1 If the project does not go ahead as planned this will result in on-going safety risks for pedestrians that use the water crossing point (watercourse) during periods of high rainfall and flooding.</p> <p>Cannot be mitigated. Community members will be forced to cross the watercourse during times of high water levels and floods at risk to their health and safety. Incidents of drowning and injury could potentially occur.</p>	<p align="center">Direct impact</p>								
		<p align="center">Before Mitigation</p>	<p align="center">N/A</p>	<p align="center">N/A</p>	<p align="center">N/A</p>	<p align="center">N/A</p>	<p align="center">N/A</p>		
			<p align="center">N/A</p>	<p align="center">N/A</p>	<p align="center">N/A</p>	<p align="center">N/A</p>	<p align="center">N/A</p>		
		<p align="center">After Mitigation</p>	<p align="center">N/A</p>	<p align="center">N/A</p>	<p align="center">N/A</p>	<p align="center">N/A</p>	<p align="center">N/A</p>		
	<p align="center">N/A</p>	<p align="center">N/A</p>	<p align="center">N/A</p>	<p align="center">N/A</p>	<p align="center">N/A</p>				

Proposed upgrade of Ntabenzima mud track in Greytown, within the Umvoti District Municipality.

Impacts/Significance associated with the Operational Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
		Scale	Duration	Probability	Magnitude	Significance Points (SP)	
1. SOIL EROSION							
1.1 The risk and potential impact of soil erosion during the operational phase because of inadequately maintained structures and ineffective stormwater control techniques along the new causeway site. Dilapidation of the causeway structure as well as erosion protection measures will lead to erosion within the receiving environment in the long term.	Indirect impact						
		Before Mitigation	Site	Permanent	Definite	Moderate	MES
			1	5	5	6	60
		After Mitigation	Site	Permanent	Medium	Low	MES
		1	5	3	4	30	

Mitigation Measures:

- To minimise soil erosion as an existing serious impact, careful consideration is required during the design stage to ensure that water directing techniques are correctly implemented within the construction site. These techniques must be designed and specified in a manner that will effectively mitigate the effects of stormwater runoff.
- Effective rehabilitation of the development footprint as well as the implementation of erosion control measures is imperative to mitigate the above risks.
- The proposed causeway structure and stormwater pipelines designs must be preferably wider than the width of the watercourse.
- On-going maintenance must be implemented by the Applicant.

Impacts/Significance associated with the Operational Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
			Scale	Duration	Probability	Magnitude	Significance Points (SP)
2. SOCIO-ECONOMIC							
<p>2.1 Increased socio-economic development in the area. Improved access to amenities, for instance, clinics and schools.</p> <p>A positive impact has been noted, therefore, no mitigation required.</p>	Direct Impact		Local	Permanent	High	N/A	LES
		Before Mitigation	2	5	4	N/A	N/A
		After Mitigation	N/A	N/A	N/A	N/A	N/A
			N/A	N/A	N/A	N/A	N/A

Impacts/Significance associated with the Operational Phase

Potential Impact	Direct, indirect, or cumulative	Significance Rating					
			Scale	Duration	Probability	Magnitude	Significance Points (SP)
3. SURFACE RUN-OFF							
<p>3.1 The project will increase the volume of traffic to the site during the operational phase. In addition to this, road surfaces and structures are recognised as a source of various pollutants which can originate from a wide variety of sources. The pollutant concentration from the runoff of these infrastructures can be highly variable and dependant on a wide variety of factors. These include location, traffic volumes, extent of dry period before a rainfall event, and nature of the causeway surface. Increase in hardened surfaces because of the new structure will lead to the increase in the flushing of these pollutants into the adjacent watercourse system during the operational phase.</p>	Direct Impact						
		Before Mitigation	Local	Permanent	High	High	MES
			2	5	4	8	60
			After Mitigation	Local	Permanent	Low	Minor
	2	5	2	2	18		

Mitigation Measures:

- Proper management and disposal of waste must occur during the lifespan of the project, including during the operational phase.

- The applicant must ensure regular maintenance of all drainage systems within the causeway site as they help in improving site drainage, and reduce pollutants entering *surface waters* and *groundwater*.

- Grass filter stripes can also be used as they function by slowing *runoff* velocities, trapping sediment and other pollutants and providing a modest infiltration

Impacts/Significance associated with the Operational Phase

Potential Impact	Direct, indirect, or cumulative	Proposed Mitigation	Significance Rating					
			Scale	Duration	Probability	Magnitude	Significance Points (SP)	
4. NO-GO ALTERNATIVE								
4.1 If the project does not go ahead this will result in continued safety risks for pedestrians crossing the watercourse during periods of heavy rainfall and flooding.	Direct impact	N/A						
			Before Mitigation	-	-	-	-	-
				-	-	-	-	-
			After Mitigation	-	-	-	-	-
-	-	-		-	-			

Impact Assessment Summary

Preferred Alternative

The proposed causeway has been carefully planned to accommodate for the validated needs and requirements of the community while being mindful of imposing the least negative environmental impact. The preferred site alternative occurs within the existing water crossing point. Vegetation clearance will be restricted to alien invasive vegetation; no indigenous vegetation will be removed as the upgrade follows the existing track indicating disturbance. The proposed causeway does not transverse any wetlands and homesteads. However, there is the presence of a small wetland that has been identified adjacent to the Mhlopeni mud track. Additionally, the proposed development will serve as rehabilitation to the environment. According to the risk rating after all significant impacts were taken into consideration, the preferred alternative is said to have a **low environmental significance** after all impacts were rated individually with and without mitigation. It was found that most of the impacts listed and rated have a low environmental significance with the mitigations being implemented. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.

Alternative 2:

No alternative site has been identified. Alternative alignments would require additional disturbance to the environment with very little potential of improvement in terms of environmental performance. The proposed causeway will be constructed on the existing track which has already been upgraded, furthermore DOT has assessed other options and none were as cost effective.

Recommendations of the EAP

- The EMPr must be strictly adhered to and implemented during the construction and operational phases.
- An ECO should be appointed by the applicant to undertake Environmental audits and submit **monthly audit reports** to the Competent Authority.
- It is imperative that surface runoff from the proposed activities is adequately managed by the contractor. The development of sound storm water management practices must be adhered to on-site as to eliminate any potential run-off into the watercourses.
- Based on the status quo above & given the indigent nature of the communities affected it is the EAP's recommendation that the preferred route and preferred technology are the best feasible options.
- To effectively inhibit the damage caused by soil erosion, the volume and velocity of water entering the watercourses from the larger catchment needs to be effectively managed.
- Operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities, if any are to be encountered.

SHELDON SINGH

(ENVIRONMENTAL SPECIALIST)

DATE

APPENDIX A.1

SITE LAYOUT

APPENDIX A.2

LOCALITY MAP

APPENDIX B

SITE PHOTOS

APPENDIX C

FACILITY ILLUSTRATION

- **C.1- PLAN OF PORTAL CAUSEWAY**
- **C.2- PLAN OF CONCRETE PIPE CULVERT HEADWALLS**
- **C.3 - PLAN OF STONE PITCHED PIPE CULVERT HEADWALLS**

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C.2- PLAN OF CONCRETE PIPE CULVERT HEADWALLS

C.3 - PLAN OF STONE PITCHED PIPE CULVERT HEADWALLS

APPENDIX D
SPECIALIST REPORTS

APPENDIX E

PUBLIC PARTICIPATION

- **E.1 – SUMMARY OF COMMENTS/RESPONSES FROM I&APS**
- **E.2 – PROOF OF RECIEPTS**
- **E.3 - SITE NOTICE**
- **E.4 – COPY OF NEWSPAPER AD**
- **E.5 – COMMENTS FROM AMAFA**
- **E.6 – COMMENTS FROM KZN WILDLIFE**
- **E.7 – COMMENTS FROM WATER & SANITATION**
- **E.8 – COMMENTS FROM DEDTEA**

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E.7 – COMMENTS FROM DEPARTMENT OF WATER & SANITATION

**E.8- COMMENTS FROM DEPARTMENT OF ECONOMIC
DEVELOPMENT, TOURISM & ENVIRONMENTAL AFFAIRS**

APPENDIX F

ENVIRONMENTAL MANAGEMENT

PROGRAMME (EMPR)