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**DRAFT BASIC ASSESSMENT REPORT
EDTEA REF. NO:**

**THE PROPOSED CONSTRUCTION OF OSAKWENI CULVERT CAUSEWAY AND
GRAVEL ROAD WITHIN THE BIG 5 HLABISA MUNICIPALITY, KWAZULU-NATAL
PROVINCE.**



Prepared by: Emvelo Quality and Environmental Consultant (PTY) Ltd

On behalf of

Big Five Hlabisa Local Municipality

Date: December 2018

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LIST OF ACRONYMS

DWS	Department of Water and Sanitation
DEDTEA	Department of Economic Development, Tourism and Environmental Affairs
EMPr	Environmental Management Programme
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
MSDS	Material Safety Data Sheet
NEMA	National Environmental Management Act
I&AP	Interested and Affected Parties
EAP	Environmental Assessment Practitioner
GA	General Authorisation

PROJECT DETAILS

Developer (DEV)

Name of the Developer	Big 5 Hlabisa Local Municipality
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Environmental Assessment Practitioner (EAP) Details

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GLOSSARY OF ITEMS

DEVELOPMENT: the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint.

BIODIVERSITY: The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.

BASIC ASSESSMENT: The process of collecting, organizing, analyzing, interpreting and communicating information that is relevant to the consideration of the application.

DEVELOPMENT FOOTPRINT: any evidence of physical alteration as a result of the undertaking of any activity.

CONTRACTOR: companies and or individual persons appointed on behalf of the client to undertake activities, as well as their sub-contractors and suppliers.

ENVIRONMENTAL CONTROL OFFICER: an individual nominated through the client to be present on site to act on behalf of the client in matters concerning the implementation and day to day monitoring of the EMPr and conditions stipulated by the authorities as prescribed in NEMA.

ENVIRONMENT: in terms of the National Environmental Management Act (NEMA) (No 107 of 1998) (as amended), Environment means the surroundings within which humans exist and that are made up of:

- ✚ the land, water and atmosphere of the earth;
- ✚ micro-organisms, plants and animal life;
- ✚ any part or combination of (i) of (ii) and the interrelationships among and between them;
- ✚ the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence;
- ✚ Human health and wellbeing.

ENVIRONMENTAL IMPACT: the change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.

MITIGATION: the measures designed to avoid reduce or remedy adverse impacts.

ENVIRONMENTAL MANAGEMENT PROGRAMME: a detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive environmental impacts and limiting or preventing negative environmental impacts are implemented during the life-cycle of the project. This EMP focuses on the construction phase, operation (maintenance) phase and decommissioning phase of the proposed project.

POLLUTION: the National Environmental Management Act, No. 107 of 1998 defined pollution to mean any change in the environment caused by the substances; radioactive or other waves; or noise, odors, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.

WATER POLLUTION: the National Water Act, 36 of 1998 defined water pollution to be the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it less fit for any beneficial purpose for which it may reasonably be expected to be used; or harmful or potentially harmful (a) to the welfare, health or safety of human beings; (b) to any aquatic or non-aquatic organisms; (c) to the resource quality; or (d) to property.

REHABILITATION: rehabilitation is defined as the return of a disturbed area to a state which approximates the state (wherever possible) which it was before disruption.

WATERCOURSE: can be a) a river or spring; b) a natural channel or depression in which water flows regularly or intermittently; c) a wetland, lake or dam into which, or from which, water flows; and/or d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water

Act, 1998 (Act No. 36 of 1998) and a reference to a watercourse includes, where relevant, its bed and banks.

WETLAND: land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

INDIGENOUS VEGETATION: refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.

GENERAL WASTE: waste that does not pose an immediate hazard or threat to health or the environment, and includes -

- domestic waste;
- building and demolition waste;
- business waste; and
- inert waste.

HAZARDOUS WASTE: hazardous waste means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste have a detrimental impact on health and the environment.

GENERAL WASTE LANDFILL SITE: a waste disposal site that is designed, managed, permitted and registered to allow for the disposal of general waste.

ARCHAEOLOGICAL RESOURCES: includes (a) material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures; (b) rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation; wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated

therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation; features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

INTERESTED AND AFFECTED PARTY: for the purposes of Chapter 5 of the NEMA and in relation to the assessment of the environmental impact of a listed activity or related activity, an interested and affected party contemplated in Section 24(4) (a) (v), and which includes (a) any person, group of persons or organization interested in or affected by such operation or activity; and (b) any organ of state that may have jurisdiction over any aspect of the operation or activity.

EXECUTIVE SUMMARY

Emvelo Consultant has been appointed by Big Five Hlabisa Local Municipality to conduct the Basic Assessment Report (EIA) for the proposed Construction of Osakweni Road and Culvert Causeway.

Based on the Local Road Standards and the envisaged functioning of the road, the proposed road will be a 64m long x 5m wide; 32m on both sides of a river and the construction of a culvert causeway that will be 15m long x 4.8m wide x 2.1m in height. The causeway structure will allow for the natural flow of water within the channel. The physical footprint of the activity is greater than 100 m².

The public participation involves undertaking of the public meeting with the affected community, consultation with the relevant Government Stakeholders and other Interested and Affected Parties (I&APs). To undertake the Public Participation Process, the onsite notices were displayed on the construction site. An advertisement was placed on Ilanga Newspaper .The Background Information Documents (BIDs) were distributed to the relevant Government Stakeholders and Umkhanyakude District relevant officials. All comments and concerns will be addressed in the Final BAR

This Draft BAR has been compiled in accordance with the EIA Regulations 2014.

1. INTRODUCTION

Emvelo Quality and Environmental Consultant has been appointed by the Big 5 Hlabisa Local Municipality to conduct the Basic Assessment Report (EIA) in terms of the Section 24(5) and Section 44 of the National Environmental Management Act, 1998 (Act No.107 of 1998) as read with the Environmental Impact Assessment (EIA) Regulations of 04 December 2014, amended in 2017. This project will be registered with the Department of Economic Development, Tourism and Environmental Affairs (uMkhanyakude District Office).

2. PROJECT TITTLE

The proposed Construction of Osakweni Culvert Causeway and Gravel Road within the Jurisdiction of the Big Five Hlabisa Local Municipality, UMkhanyakude District, Northern Kwa-Zulu Natal.

3. PROJECT DESCRIPTION

Big 5 Hlabisa Local Municipality proposes to construct Osakweni culvert causeway over a river and a gravel road on either side of the culvert. The road is a single segment that will be linked by the proposed culvert over the existing river.

The project entails the construction of a culvert causeway that will be 15m long x 4.8m wide x 2.1m in height, to assist in the river crossing, and a 64m long x 5m wide road; 32m on either side. The scope of works to be done for the proposed project includes the following:

- Clearing of Vegetation and topsoil on the existing road tracks
- Preparation of or Roadbed
- Placing and Processing a wearing course of 150mm thick layer compacted to 95% MOD ASSHTO
- Provision of storm water drainage to accommodate a 1 in10 year flood frequency
- Installation of 10 pipe culvert
- Gabion retaining walls where stable banks cannot be formed naturally
- Construction of one vehicle river crossing-causeway

4. PROJECT LOCALITY

The proposed site is located on the south-western section of the Umkhanyakude District, approximately 9.8km away from Hlabisa town. The proposed development will take place on the following coordinates indicated on the table 1 below;

Table 1: Project Coordinates

OSAKWENI ROAD AND CULVERT CAUSEWAY – WARD 11			
Latitude and Longitude	Degrees	Minute	Seconds
Start			
South	28°	5'	25.13''
East	31°	53'	24.65''
Stream Crossing			
South	28°	5'	25.03''
East	31°	53'	23.09''
End			
South	28°	5'	25.43''
East	31°	53'	21.72''

Table 2: 21 Surveyor General Code

N	0	G	U	0	0	0	0	0	0	0	0	1	7	4	3	6	0	0	0	0	0

An image below indicates the location of the project



Figure 1: Image showing site locality layout.

5. CONSTRUCTION METHODOLOGY

The following steps are going to be adopted during the construction phase.

5.1 Causeway

Standards from KZN Department of Transport were utilized in designing the proposed culvert causeway. The causeway will be constructed from a rectangular portal culvert and will be 15m long, 2.9m high and 4.8m wide. The causeway will consist of foundation slab with keys, portal culvert, and top wing-walls; and is to be equipped with bollards.

5.2. Horizontal Alignment

The road will be constructed to provide enough space for vehicles to pass each other without causing any inconvenience. The Road will approximately be 5m wide and 64m long. The horizontal alignments of the roads are governed by the existing road alignments; the earthy roads and tracks already defined by the setting of the existing property boundaries and space available.

The horizontal alignment design parameters are as follows; Road is classified as type 7A with a design speed of 30km/h, minimum centre line radius and cross fall of 12m and 4% respectively.

5.3. Vertical Alignment

The existing vertical alignment of the road is very steep and rugged, with a maximum vertical gradient ranging between 0.5% and 14%. The proposed vertical alignment is dictated by the available space and is designed to meet minimum standard requirements of the design speed based on the parameters.

In order to ensure that the existing grades are maintained, there will be an introduction of new vertical curves. This will be done, to even the grades within the confines of standard requirements for vertical alignment.

5.4. Storm-water Management

The storm-water drainage design for this development was planned according to Drainage Manual, 2006 5th Edition, published by the South African National Road Agency Limited.

Gravel lined side drains will be constructed on both sides along the road. At calculated/strategic points and where self-cleaning is feasible, a storm-water pre-cast piper culvert will be installed under the road. The very same pre-cast pipe culvert will be used to direct water away, towards natural courses on the bottom side of the road. Should it become impossible for the above objective to be met, concrete dish drains will therefore be constructed.

To prevent water from gaining access into road layers, side drains will have a depth of at least 450mm and minimum grades of 1:100. A camber and cross fall minimum of 4% will be used to achieve transversal drainage on the actual road surface.

6. DESIGN PARAMETERS

6.1. Design Speed and Road Cross-Section

A 30km/h design speed was adopted for this road. The road reserve is guided by the available working space, where the proposed alignment will run on the existing

earthy roads and tracks. A typical road cross-section which includes a 5m wide road, side v-drains and 4% chamber is proposed for this road. (Refer to Appendix D)

7. SITE ALTERNATIVE

The objective of the project is to construct a causeway over the river. During rainy seasons, the river overflows making it almost impossible to cross over. Furthermore, the gravel road will on either side of the culvert will assist road users to use the road more efficiently. Therefore, this point was regarded as a priority point of the causeway, after other sites were considered. It was seen as the preferred site will ensure the minimal impact on the surrounding bio-physical environment while serving communities separated by the river.

8. SITE ACCESS

The site is approximately 9.8km away from Hlabisa town, about 15 minutes' drive. From Hlabisa town you head north toward D1907 road, turn right unto D1907 road, then slight left, in 300m turn left towards R618, in 400m turn left unto R618. Proceed without taking any turns unto R618 for about 5.4km, and then turn right unto L1752 road towards Ethembeni Multi-Purpose Centre. In 200m turn left and then in 250m turn right unto D2055 access road. Proceed for about 2 km and the site runs parallel to and approximately 200m away from D2055.

9. NO GO

In the absence of the proposed development community members will continue to experience unsafe conditions when crossing a river. During seasons of heavy rainfall often difficulty is experienced when the river is overtopped by floodwater due to a lack of a causeway. From the dialogues of the public meeting, it was discovered that mostly women find it difficult to cross the river as they are usually the ones who accompany their children to school (Refer to table 6). Therefore, the EAP is of the view that the NO-GO option is undesirable in the face of socio-economic benefits of the community.

10. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

10.1 Solid Waste Management

Volumes of general waste collected during construction will be sorted and disposed of into the nearest licensed disposal facility. There is no part of waste that will be generated during construction, which can be classified as hazardous.

10.2 Waste Recycling Measures

On the construction site waste recycling bins will be provided to ensure that the waste is being separated accordingly. Waste will be separated into the recyclable and non-recyclable materials. The recyclable materials will be transported to the recycling facilities. Non-recyclable materials will be disposed of at the licensed landfill site. During the construction phase, construction waste will be used as fill material and as foundation where possible. The re-use of construction waste materials will minimize the amount of waste that will need to be disposed-off at registered municipal waste facilities. Only inert, non-hazardous construction material will be re-used. Raw materials with non-recyclable packaging will be avoided.

10.3 Emissions into the Atmosphere

The activity itself will not contribute directly to emissions released into the atmosphere except possible short-term dust emissions during construction. However, the construction of a road and causeway will increase the capacity of vehicles that utilize the road and in turn will cause an increase in noxious gas emissions from cars into the atmosphere and for those living adjacent to the proposed construction.

The activity will therefore have an indirect effect on the release of emissions. The release of emissions from vehicles is controlled under the Air Quality Act (Act No 39 of 1998).

10.4 Generation of Noise

During the construction phase it is anticipated that there will be noise generated from the construction activities, vehicles and machinery. The mitigation measures to reduce the level of noise will be implemented during construction.

10.5 Effluent

There will be no effluent generated during this activity. Proper measures will be put in place to contain any spills occurring during construction before it reaches the river.

11. SITE LOCALITY MAPS AND SITE PHOTOGRAPHS

Site photographs and locality maps are attached in the document as Appendix C.

12. ACTIVITY MOTIVATION

12.1 Social Economic Value of Activity

The project will contribute directly to social and service infrastructure. A total of 32 job opportunities will be created during construction and operational phase of a project. During the construction phase, a total of 12 personnel will be employed (6 new skilled & 6 unskilled employees) and a total of 20 people will be employed (10 new skilled & 10 unskilled) during the operational phase.

12.2 The Need and Desirability

In difficult times when the community or a family member dies in the community, burial becomes a problem as the deceased must be carried by foot since the vehicles cannot reach across the river. The construction of the Osakweni culvert causeway and gravel road will provide road users with an improved road access and river crossing regardless of any climatic adverse conditions i.e. intense rainfall.

Now that the need has been assessed, it is equally critical to determine the desire of the project. The site is situated within a rural settlement and the majority of the population relies on agriculture as main source of livelihood or employment. This project will temporarily help limited number of unemployed semi-skilled and unskilled groups to participate in making the project a success.

13. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

Table 3: The List of Applicable Legislation

Title of legislation	Administering authority
The Constitution of South Africa Act, 1996 (Act No. 108 of 1996)	National
KwaZulu-Natal Heritage Act, 2008 (Act No.4 of 2008)	Provincial
National Environmental Management Act, 1998 (Act No. 107 of 1998)	National & Provincial
National Water Act, 1998 (Act No 36 of 1998)	National
South African Roads Act, 1998 (Act No. 74 of 1998)	National & Provincial
The Constitution of South Africa Act, 1996 (Act No. 108 of 1996)	National

14. LIST OF ACTIVITIES APPLIED FOR UNDER THE NEMA AND EIA REGULATIONS

In terms of the Environmental Regulations promulgated under the National Environmental Management Act (NEMA), an EIA must be conducted for any development or activity that requires an Environmental Authorization. The listed activities in the NEMA, relevant to this project, that trigger the need for Environmental Authorization are listed below:

Table 4: Listed activities

Listed Activities as described in GN R.983	Description of project activity
<p>Listed Notice 1: Activity 12: The development of-</p> <p>xii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>where such development occurs-</p> <p>(a) within a watercourse;</p> <p>(c) if no development setback exists, within 32 metres of a watercourse,</p>	<p>The proposed road construction is within 32m of a water course and the construction of causeways will take place within the watercourse.</p>

measured from the edge of a watercourse;	
<p>Listed Notice1: Activity 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from –</p> <p>(i) a watercourse</p>	More than 50 m ³ of soil will be removed / excavated from the watercourse during the construction of the road and installation of causeways.
<p>Listed Notice 3: Activity 4: The development of a road wider than 4 metres with a reserve less than 13.5 metres</p> <p>d)</p> <p>xii) Outside urban areas;</p> <p>(aa) Areas within 10 kilometres from national parks or world heritage site or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve.</p>	The proposed road is about 5 metres wide with a road reserve of less than 13.5 metres and is located 8.5 kilometres away from the nearest protected area-Hluhluwe iMfolozi Park.

15. A DESCRIPTION OF THE ENVIRONMENT THAT MAY BE AFFECTED BY THE ACTIVITY

15.1 Climate

Hlabisa Local Municipality falls within the humid subtropical region, with the maximum and minimum temperatures fluctuating between 32 °C and 10.3 °C. The average annual rainfall is estimated to be between 500-900mm. The precipitations patterns are slightly skewed to the high-altitude northern areas which receive most of the rainfall as compared to low-lying western areas (Hlabisa Local Municipality IDP, 2013/2014).

The area where the road is situated has sub-tropical weather with a warm and chilly climate all year round.

15.2 Topography and Geology

Hlabisa Local Municipality has the altitude that ranges from 20m to 500m above sea level. The area is characterised by two distinct physical features which almost separate the area into two distinct topographical settings. The eastern region is characterised by flat to gentle surfaces. Whereas western region consists of plateaus comprising of rounded hilltops which are bisected by gentle slopes incised river valleys, with steep escarpment falling into south linking up with Nongoma (Hlabisa Local Municipality IDP, 2013/2014).

The landscape of Osakweni area can be characterized as having steep and rugged topography. Geologically, the site is underlain by a mantle of fill transported and residual soils overlaying weathered granite rock.

15.3 Flora

Vegetation that occurs within the area especially on steep slopes within river valleys is dominated by *Themeda triandra*. The vegetation is characterised by open grassland dominated by well-known red-grass. The presence of *Presidium aquilina*, *Magnifera indica*, and various *Acacia* species such as *Acacia karoo* as well as alien invasive species such as *Lantana camara* and *Chromolaena odorata* is evident on grassland especially on lower slopes of the valleys. (Hlabisa Local Municipality IDP, 2013/2014).

15.4 Fauna

Hlabisa Local municipality is located in one of the world's richest and diverse tourism areas. World renowned game and nature reserves such as St Lucia, Hluhluwe/Umfolozi and Mkuze are located here. The proposed site is 9 km away from Hluhluwe –Umfolozi Game Park. The Park is widely diversified, and the species found include the "Big 5"; Black & White Rhinoceros, Elephant, Buffalo, Lion and Leopard (KZN Wildlife, 2011).

Other species found are African Wild Dog, Cheetah, Hyena, Jackal, Blue Wildebeest, Giraffe, Zebra, Nile crocodile, Hippopotamus, Bushpig, Warthog, Mongoose, Chacma Baboons and Vervet Monkeys (KZN Wildlife, 2011).

There is also a wide range of Antelope species such as: Waterbuck, Kudu, Nyala, Impala, Reedbuck, Bushbuck, Duiker, Steenbok and Suni and variety of Tortoises, Terrapins, Snakes and Lizards. The park is also a prime birding destination, with over 320 recorded bird species.

15.5 Visual Environmental and Land Use

The land on which the proposed site is located is administered by the traditional authority and much of the area is under-developed. The area is characterised by steep and rugged landscape, sparsely populated settlements with the majority of households still depending on livestock, subsistence and small scale farming. The proposed site is also hosts to indigenous vegetation, some alien plant species and a river which will be crossed by the proposed culvert structure.

15.6 Heritage and Cultural Aspects

The enquiry has been lodged with AMAFA in order to ascertain whether there are any cultural sites present in the study area. Findings will be incorporated in the final Basic Assessment Report.

15.7 Social and Economic Aspects

Hlabisa Local Municipality is largely dominated by scattered rural villages, with 52.6% of the entire population being classified as economically inactive. The majority of the population lives below poverty line. This is demonstrated by 83% of the working personnel earning less than R 3 200 per month, of this figure 41% of the household have no secured income. The main employment contributors are, namely; agriculture, community service sector, manufacture and trade (Hlabisa Local Municipality IDP, 2013/2014).

16. PUBLIC PARTICIPATION

16.1 Background

Public participation is part of the EIA process which is governed under the principles of NEMA as well the EIA regulations. It is defined as the process by which an organization consults with all interested or affected parties (I&APs) which include organizations, government entities, community, NGOs etc., before making a decision. It is a two-way communication and collaborative problem solving with the goal of achieving better and more acceptable decisions. Public Participation Process provides all stakeholders including the community with a platform to raise their concerns before the Competent Authority can make a final decision about the environmental authorisation. This prevents and minimizes disputes before they become unsolvable.

Chapter 6 of the EIA regulations emphasize that the information related to the proposed project must be made available to I&APs, prior to a final decision. Therefore, this process will allow I&APs to have access to the information relating to the proposed development. The public participation process (PPP) for the proposed construction was conducted according to Chapter 6 of the December 2014 EIA regulations

16.2 Objectives of Public Participation

- To inform and involve the community and stakeholders about the proposed development.
- To identify and address the community and stakeholder's concerns regarding this development.
- To provide opportunities for the community, relevant government departments, farmers, political parties and other stakeholders to raise their concerns, suggest solutions and identify priorities.

16.3 Notification of the Interested and Affected Parties (I&APs)

Section 41 of Chapter 6 of the EIA regulations have listed the following options, to be used when notifying the interested and affected parties (I&APs):

Table 5: Public Participation Processes

<i>All the Interested and Affected parties were notified of the application by-</i>		
Fixing a notice board at the place conspicuous to and accessible by the public at the boundary, on fence, or along the corridor of any alternative sites.	YES	NO
Any alternative site also mentioned in the application	YES	NO
<i>Has a written notice been given to-</i>		
Land owner or person in control if the applicant is not in control of the land	YES	NO
The municipal councillor of the Ward in which the site and alternative site of the proposed activity.	YES	NO
The municipality which has jurisdiction in the area and other organs of state	YES	NO
<i>Placing an advertisement in-</i>		
One local newspaper	YES	NO
Any official Gazette that is published specifically for providing public notice of applications	YES	NO
One provincial newspaper, any official Gazette that is published with the purpose of providing public notice of applications.	YES	NO

16.4 Comments from the Registered Interested and Affected Parties (I&APs)

Section 43 of Chapter 6 indicates that all interested and affected parties are entitled to comment in writing on all reports produced by the applicant during EIA process. This will bring the concerns raised to the attention of the applicant.

The Public Meeting was held on the 26th October 2018, at Ethembeni Multi-purpose centre. All comments received were acknowledge and have been addressed in Table 5 below. The Public Meeting Register and photos is attached in Appendix E of the report.

Table 6: Comments and Response Report (CRR) for The Osakweni Road and Culvert Causeway Public Meeting held at: Ethembeni Multi-Purpose Centre.

NO	NAME OF I&AP	MEANS OF COMMUNICATION	COMMENT	RESPONSE BY EAP
1.	Banguyise Mthethwa	Public Meeting	Mr Mthethwa welcomed and applauded the proposed development. According to him, he stays closer to the main road (D2055), and as result he is not compelled to cross the river. However, after or during seasons of intense rainfall, it becomes difficult for him to visit his family that lives on the other side of a river. On some Instances, he recalled seeing leaners, workers including general public not being able travel to their desired locations due to the flooded river. For him it is painful to see school children not being able to make it to school as a result of climatic conditions	The EAP acknowledged this comment
2.	Ncamisile Sithole	Public Meeting	Ncamisile was happy about the proposed development. She mentioned that they are tired of having to carry groceries over their heads especially during rainy seasons when the river is frequently flooded by water.	The EAP has acknowledged this comment.

NO	NAME OF I&AP	MEANS OF COMMUNICATION	COMMENT	RESPONSE BY EAP
	Ephrem Buthelezi	Public Meeting	Ephrem was delighted about the proposed development. He went further to mention that, they want their children to go to school despite intense rainfall conditions. They have been complaining to the previous councillors about this issue, but he is now happy seeing this matter is finally being attended to.	The EAP has acknowledged this comment.
	Eric Dlamini	Public Meeting	Eric reiterated that, this project was much needed to the community and they have been waiting for this project for a very long time, but now he is happy seeing that the causeway will finally be constructed.	The EAP has acknowledged this comment.
4.	Mzwakhe Mhlongo	Public Meeting	Mzwakhe highly complemented the proposed development. For him it was rather alarming and concerning to watch his neighbours struggling to cross the river when it flooded.	The EAP has acknowledged this comment.
5.	Nompilo Mlotshwa	Public Meeting	According to Nompilo when the river is over-topped by turbulent flowing water.	The EAP has acknowledged this comment.

NO	NAME OF I&AP	MEANS OF COMMUNICATION	COMMENT	RESPONSE BY EAP
	Nompilo Mlotshwa	Public Meeting	It is extremely dangerous and threatening, because you can hardly see anything beneath water. It becomes more of a concern when we are assisting our children to cross the river on their way to school she mentioned.	The EAP has acknowledged this comment.
6.	Councillor Mthethwa	Public Meeting	According to the ward councillor, members of the community are left stranded throughout periods of intense rainfall as the causeway becomes inaccessible.	The EAP has acknowledged this comment.
8.	Sibonile Sithole	Public Meeting	According to sibonile, she is not so vocal when it comes to public meetings. However on this particular meeting she felt the need. This is because the causeway matter is close to her heart. To be precise it is something they have been longing for, for a very long time. She is looking after 6 grandchildren at home, and during times of intense rainfall she is personally responsible for carrying children over the river. According to her, this is tedious job.	The EAP has acknowledged this comment.

17. SUMMARY OF THE KEY FINDINGS FOR THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

Table 7: Direct and Indirect Impacts (Preferred Alternative)

Table 7 below shows the Environmental Impact Assessment (EIA) conducted for the planning and design phase, the construction phase and the operational phase, for the preferred alternative site.

Impact	Description	Mitigation
Planning and Design Phase		
Removal of vegetation	(a) Although the construction of the road and causeways will occur on the existing track road, where the vegetation has already been disturbed. The Excavation and site preparation will result in the removal of vegetation on the adjacent parts of the road. Disturbance of indigenous vegetation may lead to encroachment of alien plant species on-site and into the surrounding areas; and an increase in alien invasive species could lead to a possible loss of vulnerable local biodiversity.	<ul style="list-style-type: none"> ▪ Ensure that the Engineer, the Contractor, and the employees are trained on the preservation of the environment. ▪ Phased construction activities must take place to ensure the removal of vegetation, only as it becomes necessary for work to proceed. ▪ The vegetation found on site must not be removed for the purpose of making fire. ▪ Vegetation must only be removed on the site demarcated and authorized for construction. ▪ Where necessary the disturbed areas should be re-vegetated using a specific seed mix or indigenous trees.

Impact	Description	Mitigation
Planning and Design Phase		
Removal of vegetation		<ul style="list-style-type: none"> ▪ All exposed earth should be rehabilitated promptly with suitable vegetation to protect the soil. ▪ Alien plant encroachment must be monitored and prevented ▪ Where necessary the disturbed areas should be re-vegetated with plants that attract seed eating and nectar-feeding birds, for the purpose of pollination and re-vegetation.
Soil erosion	Excavation of site or removal of soil, during the site preparation, could result in soil compaction and soil erosion.	<ul style="list-style-type: none"> ▪ Provide environmental awareness training on soil erosion prevention. ▪ Suitable precautions such as removing vegetation on steep areas must be avoided. ▪ Avoid prolonged vegetation disturbance; vegetation must be replanted on the disturbed areas as soon as possible. ▪ Use sediment barriers to avoid surface run-off of sediments. ▪ Counter drains must be installed to intercept overland flows of the steepness of the slopes.

Impact	Description	Mitigation
Planning and Design Phase		
Sedimentation	<p>(a) Poor planning and execution of a causeway plan can cause an impounding effect by holding back not only water but also the sediments that are suspended on water, starving the freshwater ecosystem downstream.</p> <p>(b) Sediment pathways within the river may be affected by the introduction of the culvert causeway and the alteration of the original pathway. Thus possibly increasing the deposition of sediments found within the river.</p> <p>(c) The further increase in the deposition of sediments will definitely decrease the depth of the river.</p>	<ul style="list-style-type: none"> ▪ Installation of a causeway structure must be of suitable height to avoid blockages during heavy rainfall period. ▪ Any exposed earth should be rehabilitated promptly with suitable vegetation to protect the soil. ▪ The installation of pipes below culvert structure must be of suitable diameter. This will ensure that the original transportation regime of sediments is maintained. ▪ After the concrete causeway has been constructed, the disturbed areas must be engineered to coincide as close as possible to the original river contour. This will reduce the potential for in-river erosion and river bank failure.
Community Members	Community members can be affected if they are not made aware of the risks associated with the construction project.	<ul style="list-style-type: none"> ▪ Environmental awareness must be provided to the community to train them of the potential hazards that might occur during construction.

Impact	Description	Mitigation
Planning and Design Phase		
Community Members	They might interfere with the working areas and are at risk of getting injured if not notified.	<ul style="list-style-type: none"> ▪ When choosing the access routes, disturbance to the neighbouring community, private owners, and local businesses must be considered.
Construction Phase		
Nzimane River Causeway Management		
Water Pollution	<p>(a) Construction vehicles pose major threats with regards to spillages on-site; this may result in the contamination of nearest water source.</p> <p>(b) Concrete mix done on bare soil and adjacent to a water source might cause water pollution if not contained on site. A possible pollution of a river caused by contaminated run-off can also be anticipated</p>	<ul style="list-style-type: none"> ▪ Environmental awareness and training about the water pollution must be provided to the employees before construction commences. ▪ Every effort should be made to ensure that any chemicals or hazardous substances do not contaminate the surface or ground water on site. ▪ Storage areas that contain hazardous substances must be bunded with an impermeable liner. ▪ Vehicles washing should not be allowed on site. ▪ Cement mixing is not permitted in any area where runoff can enter the river. All cement is to be mixed on impermeable sheeting/boards.

Impact	Description	Mitigation
Construction Phase		
Nzimane River Causeway Management		
Water Pollution		<ul style="list-style-type: none"> ▪ The materials that will be used to install culvert should not be mixed within the Watercourse. ▪ Mixing of cement or concrete should not be carried out within erosive sensitive areas to avoid possible contaminated run-off during rainfall period.
River Banks Disturbance	<p>(a) Construction activities including the movement, parking of construction vehicles and machinery within the banks of a river or within 32m from the edges of the watercourse will loosen sedimentary material resulting in an increase in the current sediment load and bank failure.</p> <p>(b) Construction activities within the riverbed will undoubtedly require the diversion of water and modification of the riverbed and riverbanks</p>	<ul style="list-style-type: none"> ▪ The construction of a culvert structure in a causeway crossing should make use of excavators instead of bulldozers to minimize deposition of sediments within a stream. ▪ Construction should preferably be undertaken during the dry winter months when river input is naturally low, thereby reducing the risk of mass erosion of sediment from within the channel and exposed riverbanks.

Impact	Description	Mitigation
Construction Phase		
Nzimane River Causeway Management		
River Banks Disturbance		<ul style="list-style-type: none"> • Unnecessary movement of construction vehicles and machinery should be limited to non-sensitive areas, preferably 100m away from the stream. • Immediately after constructing causeway crossing disturbed areas should be re-vegetated to avoid bank failure and stream erosion.
Wetland Management		
Wetland Disturbance	<p><i>Positive Impact:</i> With the assistance of the GIS data made available by the South African National Biodiversity institute, there are no Wetland Freshwater Ecosystem Priority Areas that fall within 1 km from the proposed project. Therefore, during the construction phase no wetland habitats will be affected.</p> <p>A further assessment was made using QGIS to identify any wetland land that might be present within a 500m radius and no wetlands were identified</p>	N/A

Impacts	Description	Mitigation
Construction Phase		
Wetland Disturbance	Please refer to the attached Appendix C. However, proper precautionary approaches will be adopted to prevent or mitigate any possible impacts on the identified water crossing.	<ul style="list-style-type: none"> ▪
Noise pollution	Excessive noise might be generated during the construction, from the delivery vehicles, earth moving machinery and piling works. This can cause the negative impacts on the people living next to the construction site.	<ul style="list-style-type: none"> ▪ Excavation activities can be conducted during the daylight hours only, no excavation should be allowed before or after working hours. Training and environmental awareness must be provided to the workers about the noise pollution. ▪ Noise dampening mechanisms must be installed on the moving machinery'. ▪ Earplugs must be provided to the workers.
Air Pollution	(a) Dust will be generated from construction activities like stockpiling. It will also be generated from bare surfaces and moving machinery, which can cause air pollution.	<ul style="list-style-type: none"> ▪ Training and environmental awareness must be provided to workers. ▪ Proper stockpile management must be implanted to reduce dust. ▪ Where necessary dust must be suppressed using water tankers.

Impacts	Description	Mitigation
Construction Phase		
Air Pollution	(b) The proposed construction phase activities will affect air quality as a result of emissions caused by exhaust fumes. The effect on air quality is expected to be very localised and minor.	<ul style="list-style-type: none"> ▪ Dust from the stockpiles must also be suppressed to reduce dust. ▪ Strict speed limits must be implanted on the dusty roads. ▪ Traffic moving in and out of the site must be reduced to reduce air pollution. Emissions into the air can be minimised by ensuring regular maintenance of construction vehicles and equipment in order to reduce emission of exhaust fumes.
Fauna	Construction of the road might have an impact on the important habitats adjacent to the road. Some animals can be damaged by the construction machines during excavation; some can be tempered by the humans working on construction site.	<ul style="list-style-type: none"> ▪ Animals found on-site must not be removed or tampered with. The disturbed areas must be re-vegetated to attract animals. ▪ Construction areas must be kept clean to attract animals; there must be proper solid waste management system in place. ▪ There should be no killing of animals found on site.

Impacts	Description	Mitigation
Construction Phase		
Fauna		<ul style="list-style-type: none"> ▪ Blasting and earth moving activities must be scheduled to occur at the same time to avoid repeating noisy activities that might have an impact on animals. ▪ The stream crossing culverts and pipes must be designed in a way that it won't block the movement of aquatic habitats.
Cultural Aspects	<p>During site visit there were no graves or cultural aspects that were identified. Nonetheless road construction activities can cause an impact to cultural resources that might be buried underground.</p>	<ul style="list-style-type: none"> ▪ Should any artifact or heritage resource be encountered, the contractor is advised to stop the operation immediately and report the matter to the municipality. ▪ The inquiry has been lodged with AMAFA to establish if there are existing cultural structures on site.
Health and Safety	<p>Construction activities can be hazardous to the public as well as the workers.</p>	<ul style="list-style-type: none"> ▪ Employees must be provided with appropriate Personal Protective Equipment (PPE). ▪ Firearms or hunting weapons must be prohibited on site. ▪ Eating areas must be provided within the construction camp.

Impacts	Description	Mitigation
Construction Phase		
Health and Safety		<ul style="list-style-type: none"> ▪ Workers must be trained in handling chemicals and the Materials Safety Data Sheet (MSDS) must always be provided for the chemical brought on site. ▪ Where possible the safety signs must be displayed to warn the public of the hazards associated with the construction. ▪ Eating areas must be provided within the construction camp.
Community Members	<p>Construction activities might cause impacts on the people living nearby. People living nearby are at risk of being Injured by construction vehicles or machines.</p>	<ul style="list-style-type: none"> ▪ Access to the construction campsite and construction sites must be monitored. ▪ Ensure that the construction camp is fenced to avoid trespassing of animals and local people. ▪ Safety signs must be displayed to warn the community of the potential hazards within the construction site. ▪ Strict access to the construction site must be ensured to avoid any disturbance or interference by the community.

Impacts	Description	Mitigation
Construction Phase		
Socio-economic impact	<p><i>Positive Impact:</i></p> <p>The local people will acquire construction skills. On-job training for the laying of the bricks, concrete mixing and laying of storm water pipes will be provided. The micro-local economy will be improved as some local businesses will grow during this construction.</p>	
Operational Phase		
Road Construction	<p><i>Positive impact:</i></p> <p>Construction of the road will provide the community with an easy access to the service delivery and safe stream crossing.</p>	
Fauna	<p>Creating road barriers can impact animal's population, because some animals can be reluctant to cross the large open spaces, with no vegetation.</p> <p>Some of the risks encountered by habitats adjacent to the road include being struck by the vehicles traveling on the road. Excessive noise from the cars can have a detrimental impact on birds, which</p>	<ul style="list-style-type: none"> ▪ During rehabilitation, the sides of the road must be re-vegetated to attract animals. ▪ Strict speed limits must be implemented to avoid killings of habitats and domestic animals from the nearby community. ▪ Debris must be removed from the road and oils or chemicals that might be spilled from the cars must be contained to avoid harm to animals.

	might decline the bird's population in the proximity areas of the road.	<ul style="list-style-type: none"> ▪ Traffic signs to alert the road users of -animals crossings must be displayed along the road
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Table 8: Cumulative Impacts

Impact	Description	Mitigation
Alien Invasive plant species	Clearing of the land for road construction often encourages the spread of invasive species. Several invasive species also infiltrate the habitats using the roads.	Removal of the weeds and alien vegetation must be implemented to prevent the spreading.

18 THE RATING CRITERIA FOR THE IDENTIFIED IMPACTS AND RISKS

The table below indicates the rating criteria that was used to rate the extent of the identified impacts. It also indicates the method that was used to rate the impacts. The score range from 10 to 100, where 10 indicates lowest impact, 60 indicates medium and 100 indicates the highest impact. The score then determines the significance, duration and the extent of impact.

Table 9: The rating criteria for the identified impacts and risks

Planning and design Phase		
Removal of Vegetation		
Raring criteria	With mitigation measures	Without mitigation measures
Score	20	70
Significance	Low	Medium
Duration	Immediate	Long term
Extent of impact	Site	Local
Impact rating summary	The removal of indigenous vegetation must only be limited to a development footprint and areas exposed must re-vegetated with indigenous plants. All reasonable precautions as stipulated under mitigation measures must	

	be taken into consideration to avoid possible damage to the surrounding environment and alien species encroachment.	
Soil Erosion		
Rating criteria	With mitigation measures	Without mitigation measures
Score	25	60
Significance	Low	Medium
Duration	Short term	Long-term
Extent of impact	Local	regional
Impact rating summary	Easily adoptable precautions such as not removing vegetation on steep gradients must be exercised. Any failure to implement mitigation measures as recommended could result in a degradation of topsoil.	
Sedimentation		
Rating Criteria	With mitigation measures	Without mitigation measures
Score	35	60
Significance	Low	Medium
Duration	Short term	Long-term
Extent of impact	Site	Local
Impact rating summary	The deposition of sediments can be reduced by proper planning and execution of a causeway crossing. If sediments deposition is no managed and left unattended the impact can be severe not only to the depth of the stream but also to freshwater ecosystem down the stream. Mitigation measures should be implemented as recommended	
Community Members		
Rating Criteria	With mitigation measures	Without mitigation measures
Score	20	75
Significance	Low	Very High
Duration	Immediate	Long-term
Extent of impact	Site	site
Impact rating summary	Immediate community members must be notified before	

	the commencement of the construction activities. Failure to do so, the possibility of fatalities or injuring a community member would not be avoided.
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CONSTRUCTION PHASE		
Water pollution		
Raring criteria	With mitigation measures	Without mitigation measures
Score	20	60
Significance	Low	Medium
Duration	Immediate	Short term
Extent of impact	Site	Local
Impact rating summary	Water pollution can be reduced if the mitigation measures are applied properly. The impact on the Water quality and aquatic ecosystem can occur over a long period of time if the mitigation measures are not implemented	
River Banks Disturbance		
Raring criteria	With mitigation measures	Without mitigation measures
Score	20	75
Significance	Low	Very High
Duration	Immediate	Short term
Extent of impact	Site	Local
Impact rating summary	The stability of stream banks can be maintained provided that mitigation measures are implemented efficiently. The impact of bank failure could be disastrous to the freshwater ecosystem.	
Noise Pollution		
Rating criteria	With mitigation measures	Without mitigation measures
Score	25	70
Significance	Low	High
Duration	Short term	Long-term
Extent of impact	Local	regional
Impact rating summary	When proper mitigation measures are implemented, noise	

	impacts will be reduced and that will create a safe environment for the workers, animals, and community. All reasonable precautions as stipulated under mitigation measures must be taken into consideration to minimize the noise generated on site	
Air Pollution		
Rating Criteria	With mitigation measures	Without mitigation measures
Score	35	70
Significance	Low	High
Duration	Short term	Long-term
Extent of impact	Site	Local
Impact rating summary	The air pollution can be reduced by simply applying the mitigation measures. If the air pollution is not controlled and left unattended it could result in long-term impacts and serious illness to the local community.	
Health and Safety		
Rating Criteria	With mitigation measures	Without mitigation measures
Score	20	75
Significance	Low	Very High
Duration	Immediate	Long-term
Extent of impact	Site	site
Impact rating summary	The application of the health and safety mitigation measures will help the contractor to reduce injuries rate on site and illness to employees as well as help to keep safe the local community. Failure to execute mitigation measures would result in dire consequences; Such as causing chronic illness or injury.	
Fauna		
Rating Criteria	With mitigation measures	Without mitigation measures
Score	35	60
Significance	low	medium
Duration	Immediate	Long-term
Extent of impact	Site	Local

Impact rating summary	The killing of wild and domestic animals on site can be avoided provided that workers are properly trained on the application of the appropriate mitigation measures.	
OPERATIONAL PHASE		
Road Construction		
Rating criteria	With mitigation measures	Without mitigation measures
Score	20	70
Significance	Low	High
Duration	Immediate	Long-term
Extent of impact	Local	Local
Impact rating summary	If the mitigation measures are not properly implemented the activities associated with construction of a road could be dangerous to the residents and pedestrians, but the application of the mitigation measures could help in avoiding possible negative incidents from happening.	
Fauna		
Rating Criteria	With Mitigation measures	Without mitigation measures
Score	25	75
Significance	Low	High
Duration	Immediate	Long-term
Extent of Impact	Site	Local
Impact rating summary	Mitigation measures can play a big role in reducing the animal killings during the operational phase of the road. As the traffic increase, it poses a higher risk to the wild animals and domestic animals that will be crossing the road. As recommended on the mitigation measures, signage should be installed to warn traffic vehicles of animals crossing the street.	
Fauna Habitat		
Rating Criteria	With mitigation measures	Without mitigation measures
Score	20	75
Significance	Low	High

Duration	Immediate	Long-term
Extent of impact	Local	Local
Impact rating summary	In case where mitigation measures are not properly implemented, there is a high probability of losing indigenous vegetation (Fauna Habitat) on site and adjacent areas. However, that risk can be reduced to a low risk by implementing the mitigation measures.	

CUMULATIVE IMPACTS		
Alien Invasive Plant Species		
Rating criteria	With mitigation measures	Without mitigation measures
Score	18	59
Significance	low	70
Duration	immediate	high
Impact rating summary	Invasive plant species can be very dangerous and can be economically costly if the mitigation measures are not implemented during the operational phase	

19. RECOMMENDATIONS BY SPECIALISTS

19.1 RECOMMENDATIONS BY GEOTECHNICAL SPECIALIST FOR THE PROPOSED CONSTRUCTION OF OSAKWENI GRAVEL ROAD AND CULVERT CAUSEWAY.

The Geo-technical study for the Osakweni Road Construction and Culvert Causeway was conducted by Geo-Caluzza Consulting Engineers (Pty) Ltd and the following recommendations were made:

The surfacing of the road was designed using guidelines set out on the Draft TRH 20. The following recommendations were then made with regards to determining the thickness of a gravel surface.

19.1.1 In situ Subgrade Conditions

With regards to directly laying the gravel wearing course on the compacted in situ subgrade, the subsequent conditions must exist;

- The in situ CBR should be greater than 5%, as determined by the result of CBR Dynamic Cone Penetrometer test,
- Fair subgrade quality should exist as indicated by laboratory test result,
- Road should be well drained and if not , may require to be raised by up to 300mm on a prepared formation of material with in situ CBR of greater than 5%.

In principle should the CBR of greater than 5% be met, a wearing course thicker than 200mm will therefore be redundant, although this value is probably not sufficient to account for gravel losses due to erosion and compaction. In the near future the re-gravelling programmes should be put in place to cover the anticipated design life.

However, in case the in situ CBR of less 5% exist, the wearing course should then be erected on a formation of 300mm of imported material possessing the in situ CBR of greater than 5% or at least G9 quality. Alternatively, to compensate for the reduction of in situ subgrade support, a thicker wearing may be opted for. In this case a nominal wearing course thickness of 100mm is recommended to protect the weak upgrade. This minimum thickness is only one constituent, of a wearing course design thickness and is more likely to require other thickness due to compaction, annual gravel loss and the required design life.

19.1.2 Estimated traffic compaction and annual gravel loss

Overtime, as the gravel road is used; the thickness will continue to deteriorate as a result of compaction by traffic. A loss of a wearing course through compaction can be as up to 30% of layer thickness. It is therefore of vital importance that adequate compaction is exercised during construction.

The quality of the gravel material used for surfacing is inversely proportional to the anticipated annual gravel loss. Gravel material with superior binding qualities that can limit the annual gravel loss, are classified as Good or Type E. Whereas gravel materials which are more likely to cause fairly heavy annual gravel loss are classified as type A, B, and C.

Clayey gravel material consisting of high PI values and shrinkage products will on the other hand be well-integrated or exhibit high level of cohesiveness (Type D) and will result into low gravel loss. However one problem with these materials is their high level of slipperiness when wet and in particular when used on steep grades.

19.1.3 Wearing Course Thickness

In areas where the in situ CBR is less than 5%, a minimum gravel thickness of 300mm is recommended, to allow for nominal thickness of 100mm to protect the weak subgrade. Inversely, in areas where subgrade CBR is greater than 5%, the recommended minimum gravel thickness is 200mm. This is by far thicker, if less erodible material such as Type E or D is used for surfacing.

19.1.4 Recommendations for Subgrade Treatment

Subgrade treatment should comprise rip and re-compact procedure. The surface of the proposed road should be ripped to at least 300mm depth, wet and re-compacted to a minimum density of 90% Modified AASHTO and Optimum Moisture Content (OMC). Detailed recommendations are as follows;

- Create new road formation,
- Create generous side drainage,
- Remove to a depth of 300mm the in situ soil,
- The in situ materials should be re-compacted to a minimum density of 90% Modified AASHTO AND OMC prior to the replacement of wearing course.
- Add better quality material, i.e. G7/G8 taken from site and place in 150mm layers, then box out excavation and compact to 93% Modified AASHTO and OMC.
- Remove materials classified as worse than G10 when encountered at or near surface and replace with G7/G8 materials.

19.1.5 Subsoil Drainage

No groundwater seepage was encountered during time of investigation. However, the situation can be anticipated to significantly change during and after wet season or during prolonged rainfall period. The presence of surface water channels along the route, necessitate a surface drainage system along the road to prevent water ingress into structural layers. Water gaining access into road layers will negatively affect material compaction and result in subgrade softening leading to bearing capacity failure.

19.1.6 Foundation recommendations for the proposed culvert causeway bridge structure.

The proposed road will cross over Nzimane River, hence culvert structures in a form of pipe or boxed culvert are recommended.

Geotechnical engineering test was conducted on the inspection pits IP6 through to IP7 within Nzimane River to a depth ranging between 1.20 and 1.34 below the existing ground level. A penetrometer test was also conducted below the existing ground level to a refusal depth ranging between 1.8 and 3.9 next to these inspection pits. These tests were performed with aim of understanding soil properties and the arrangement of soil layers beneath the surface in order to make proper recommendations.

It is therefore recommended that the proposed causeway in a form of piped or boxed culvert should be founded, preferably on soft to medium hard weathered granite bedrock. Using conventional strip footing whereby an Estimate Allowable Safe Bearing Pressure of 350kPa can be assumed on either soft granite bedrock well compacted G4 material or dump rock layer blinded with the in situ soils removed on 3.0m minimum excavation.

The foundation of excavation for the bridge structure should be inspected to confirm depth of founding and bearing pressure or alternatively, the causeway bridge should be founded as follows;

- Remove in situ material to a depth of at least 1.5m below existing ground
- The base of the excavation to be ripped and re-compacted to at least 90% MDD and OMC,
- Import better quality material of at least G5 quality and compact to at least 98% MDD and OMC in layers not exceeding 150mm in thickness or layers commensurate with compacting equipment being used
- The concrete may be then poured on the engineered fill where and Estimated Allowable Safe Bearing Pressure of 150kPa may be assumed
- Scour protection measure may be considered as per engineer's discretion.

The choice of foundation type and the design of the foundations will need to be done by a competent structural engineer once the entire structural layouts have been determined.

19.3. RECOMMENDATIONS FROM THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

The EAP recommends the authorization of this application: However, the following conditions and mitigation measures are recommended and should be considered in any authorization that may be granted by the competent authority in respect of the application.

- Appoint an Environmental Control Officer (ECO) to oversee and advise on site specific environmental management requirements. The ECO must be appointed for the duration of the construction period.
- The Developer must be cognizant of the sewage infrastructure on site and Eskom servitude
- Surrounding residents must be notified in advance of construction schedule.
- Activities which will lead to excessive noise near residential areas should be limited to take place during the day.
- All reasonable precautions must be taken to minimize noise generated on site.
- Construction vehicles must be kept in good working order so as not to generate excessive noise.
- Maintenance done on construction vehicles must be done in such a manner to prevent spillage of fuel and oils.
- Use inert construction waste (e.g. old road surface and foundations) as fill material where possible.
- After the completion of construction, any possible soil compaction and spillage of substances within the construction camp must be rehabilitated.
- Visible remains of concrete as a result of construction must be physically removed and disposed of as building wastes.
- Non-hazardous material should be recycled and utilized in other construction processes.
- Disposal of waste at a registered waste disposal site.
- If excessive spillage of oil and fuel etc. should occur due to accidents, it should be cleaned-up immediately.
- Obtain fill material from existing borrow pits to minimize the impact of creating new borrow pits.
- Construction camp to be erected where it will have the least environmental impact.
- Implement erosion control measures where applicable.
- During construction all staff must be adequately identified.

- No construction workers are permitted to be accommodated overnight on the site or in the site construction camp except for skeleton security personnel.
- Re-vegetate and rehabilitate after construction.
- Where possible limit the removal of riparian vegetation.
- Only indigenous vegetation should be utilized during rehabilitation.
- Rehabilitation success should be monitored.

20. CONCLUSIONS

The above report provides a detailed Draft Basic Assessment Report (DBAR) for the proposed Construction of Osakweni Gravel Road and Culvert Causeway. This report and documentation attached are sufficient to decide in respect of the activity applied for, in the view of the EAP.

The EIA process was conducted according to Appendix 1 of the EIA regulations, December 2014 and the NEMA as amended in 2017. The assessment was based on the information provided, the site inspection conducted by the EAP and DEDTEA, as well as the comments by the Stakeholders.

This draft report will also provide the Interested and Affected Parties (comments from stakeholders) (I&APs) with an opportunity to comment, their comments will be reviewed and will be incorporated in the final Basic Assessment Report.

The Competent Authority (CA) is required to assess the report based on the information currently provided and take a final decision once the information submitted is complete. Envlo Consultant will continue to liaise with all the I&Aps during the process

APPENDIX A

DECLARATION OF INFORMATION

I, the undersigned Phumzile Lembede, on behalf of **Emvelo Quality and Environmental Consultant**, hereby declare that the information provided in this application is correct and true.

Signature

Date

Position

Company Name

APPENDIX B:
ENVIRONMENTAL MANAGEMENT PLAN(EMPr)

**APPENDIX C:
SITE PHOTOGRAPHS AND LOCALITY MAPS**



Figure 2: Showing case images.

**APPENDIX D:
LAYOUT PLANS**

APPENDIX E
THE PUBLIC PARTICIPATION PROCESS, PUBLIC MEETING REGISTER AND
STAKEHOLDER INVOLVEMENT

The images below show public meeting which was held, register of interested and affected parties, the onsite-notices which were displayed onsite as well distributed to stakeholders and the advertisement placed in the Ilanga News Paper



Figure 4: Public Meeting held at Ethembeni Multi-Purpose Centre.

**APPENDIX F:
EAP'S CV(S)**

**APPENDIX G:
GEOTECHNICAL ASSESSMENT**

