

THE PROPOSED CONSTRUCTION OF DALINKOSI PEDESTRIAN BRIDGE



DRAFT BASIC ASSESSMENT REPORT



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		TITLE: Proposed Dalinkosi Pedestrian Bridge		
Ref No:	Dalinkosi	DATE: 22 August 2023	REPORT STATUS: Draft	
Project No:	Dalinkosi			
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SYNOPSIS: Draft Basic Assessment Report				
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NOTICE

This Draft Basic Assessment Report (DBAR) has been prepared by SA SHEQ Consultants on behalf of Alfred Duma Local Municipality with regards to the proposed Dalinkosi Pedestrian Bridge found in Ward 30 of Alfred Duma Local Municipality.

The purpose of this Basic Assessment Report (BAR) is to present the proposed project as well as its need. The affected environment is described at a sufficient level of detail to simplify informed decision making. This BAR will aim to assess and present to the competent authority the predicted positive and negative impacts of the proposed project on the receiving environment, enabling the Environmental Consultant to provide recommendations to avoid or mitigate negative impacts and enhance the positive benefits of the project.

An Environmental Management Programme (EMPr) for the proposed development will also be included as part of this application to present effective measures to mitigate the impacts associated with the proposed project on the receiving environment. The information contained in this report is a combination of primary data collection (onsite exercise) and secondary desktop research.

The draft Basic Assessment Report will be made available to all Interested and Affected Parties (I&APs) and stakeholders for a 30-day review period. All comments received during this period will be taken into consideration and included in the Final Basic Assessment Report (fBAR) as applicable and where necessary.

EXECUTIVE SUMMARY

Project Description

Alfred Duma Local Municipality proposed to construct a pedestrian bridge in the Dalinkosi area. The project aims to make easy and safe access to cross the river for the community, especially in events of heavy rainfall. Following engagements with the councilors, the community indicated that it is hard to travel on the existing road during the rainy season when the stream is full. The proposed pedestrian bridge is 60m long and 1.5m wide. The total footprint of the pedestrian bridge is 90m² with the proposed construction corridor of 145.63m².

Environmental Assessment Framework

With regards to the National Environmental Management Act (107 of 1998) in line with the Environmental Impact Assessment Regulations, as amended on 07 April 2017, the following Listing Notices GNR 324- GNR 327 will be triggered in line with the proposed development triggers the following activities:

- GNR 327, Activity 12: *“The development of iii. bridges exceeding 100 square metres in size. Where such a development occurs within a watercourse.”*
 - The construction of 60m long and 1.5m wide pedestrian bridge. The proposed development will have.
- GNR 327, Activity 19 (i): *“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 watercourse.”*
 - The construction of the pedestrian bridge will require the excavation and infilling of material of over 10 m³.

The above listed activities trigger a Basic Assessment, therefore, Alfred Duma Local Municipality is in the process of applying for an Environmental Authorisation, to the Department of Economic Development, Tourism and Environmental Affairs (EDTEA) (uThukela District) for the proposed construction of Pedestrian bridge.

Public Participation

The public participation plan for the proposed project was compiled and submitted to EDTEA for approval. In summary the following tasks were conducted in line with this BAR: a Background Information Document (BID) was circulated to the various stakeholders, in order to inform them of the proposed development.

Site Notices were put up around the community public places, informing the community of the proposed construction of the proposed construction of the pedestrian bridge. The site notices also had details of

when they want to register as an Interested and Affected Party for this development. An IsiZulu and English advert were published in the Uthukela Eyethu and Ladysmith Gazette respectively.

NB: A detailed public participation report will be appended in the Final BAR.

Specialist studies

The following specialist studies were conducted for the proposed Dalinkosi Pedestrian Bridge, and are included in the draft BAR and have been attached in **Appendix E**.

- Biodiversity Assessment (Wetlands, Fauna, and Aquatic)
- Terrestrial Biodiversity Assessment
- Geotechnical Assessment
- Floodline Assessment
- Paleontological Assessment

ACRONYMS AND ABBREVIATIONS

BAR	Basic Assessment Report
BID	Background Information Document
CA	Competent Authority
DBAR	draft Basic Assessment Report
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EDTEA	Department of Economic Development, Tourism and Environmental Affairs
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
FBAR	final Basic Assessment Report
Hon	Honours
IAP	Invasive Alien Plants
IEM	Integrated Environmental Management
I&APs	Interested and Affected Parties
IWWMP	Integrated Wastewater Management Plan
NEMA	National Environmental Management Act
PPP	Public Participation Process

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1. INTRODUCTION

The Alfred Duma Local Municipality is currently faced with the challenge of developing infrastructure for the health and safety of the livelihoods of people in communities, especially rural areas. One of the ways of developing the communities is by ensuring service delivery to the people and ensuring that they have easy and safe access to areas of importance.

The community of Dalinkosi identified an issue that they are currently experiencing, which is preventing easy and safe access to places such as clinics, schools etc. There is a river that the people in the community use to frequently to cross, to access clinics and schools. The crossing of this stream is a challenge and is a risk especially during rainy seasons. This is a huge concern as the school children of primary ages are crossing this stream to get to school.

The stream gets very full and the rocks used to cross get very slippery, making it near impossible and very dangerous to cross in those conditions. This has been noted after the recent KwaZulu-Natal flooding of the devastating results of flooding in rivers. The community further raised this issue with the Ward councilor of the area to request for a bridge to be constructed. The construction of the pedestrian bridge was therefore agreed upon to make things easier and safer for the community.

The main purpose for the construction of Dalinkosi pedestrian bridge is to enhance and protect the livelihoods of the community whilst creating a safe and all-seasons access for the local community without restricting mobility across the river.

Under the National Environmental Management Act (NEMA) (No. 107 of 1998), in light of the Environmental Impact Assessment (EIA) Regulations as amended in April 2017. The proposed project triggers listed activities. This means that an Environmental Authorisation (EA) needs to be obtained before any construction commences. Alfred Duma Local Municipality, therefore, must apply for the EA at EDTEA for Environmental Approval.

2. PURPOSE OF THIS DOCUMENT

SA SHEQ has been appointed by Mvulo Engineers on behalf of Alfred Duma Local Municipality in accordance with the requirements of the National Environmental Management Act (107 of 1998) as Independent Environmental Consultants for the proposed construction of the pedestrian bridge in Ward 30 of Alfred Duma Local Municipality, in an area known as Dalinkosi.

The purpose of this Basic Assessment Report (BAR), includes the following (amongst others):

- Present the proposed project to Interested and Affected Parties (IAPs) and Authorities.

- Describe the potential environmental impacts which the proposed development might have on the receiving environment at a level of detail to facilitate informed decision-making by the Competent Authority.
- Identify the legal framework which will be triggered by the proposed project.
- Provide an overview of the Basic Assessment Process being followed, including public consultation.
- Identify and engage with Interested and Affected Parties and allow for adequate participation in the process.
- Assess the predicted positive and negative impacts of the project on the receiving environment.
- Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project.
- Provide an Environmental Management Programme (EMPr) for the proposed project.
- Assess the receiving environment in terms of current state and potential positive or negative impacts.
- Identify significant issues to be investigated further; and
- Allow for informed decision-making regarding the Basic Assessment process.

3. DETAILS OF EAP

Nomthandazo Mkhize (Environmental Assessment Practitioner): Ms. Nomthandazo has a BSc (Hons) in Environmental Management from the University of South Africa (2020) and a BSc in Environmental & Engineering Geology from the University of KwaZulu-Natal (2015), and over 07 years of experience working as an Environmental Impact Assessment Practitioner. Nomthandazo is a registered Professional Natural Scientist (Environmental Scientist) with the South African Council for Natural Scientific Professions (SACNASP) and is a Registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA).

Nomthandazo has extensive experience in managing Environmental Impact Assessment processes including housing, resort, and commercial developments, water infrastructure projects including dam, water supply schemes and pipelines, the expansion of educational facilities, new roads and road upgrades. In addition, Nomthandazo has conducted extensive environmental auditing, drafting of Environmental Management Plans/ Programs and Environmental Control Officer (ECO) work for different construction activities as a requirement by the Department of Environment, Forestry and Fisheries.

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Sinobuhle Mntambo (Reviewer): Sinobuhle has a BSc (Hons) Environmental Management) and over 6 years' experience working as an EAP. She is currently involved in the compilation of Water Use License Application (WULA), BAR, EMPr as well as undertaking research relating to EIAs, and Water

Use License process being undertaken by the company. is a Registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA).

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4. PROJECT OVERVIEW

4.1 Location

The proposed Dalinkosi Pedestrian Bridge is in an area of Dalinkosi, Ward 30 of Alfred Duma Local Municipality. See **Figure 1** below for the proposed site. The locality map is attached in **Appendix B**.

Province	KwaZulu-Natal
District Municipality	Uthukela District Municipality
Local Municipality	Alfred Duma Local Municipality
Ward	30
Geographic Co-ordinates	28°31'55.40S", 30°09'20.88E"
21-Digit Surveyor Code	N0GT0000000011580000
Farm Name	Asyn Kraal
ERF no	1158
Potion	1

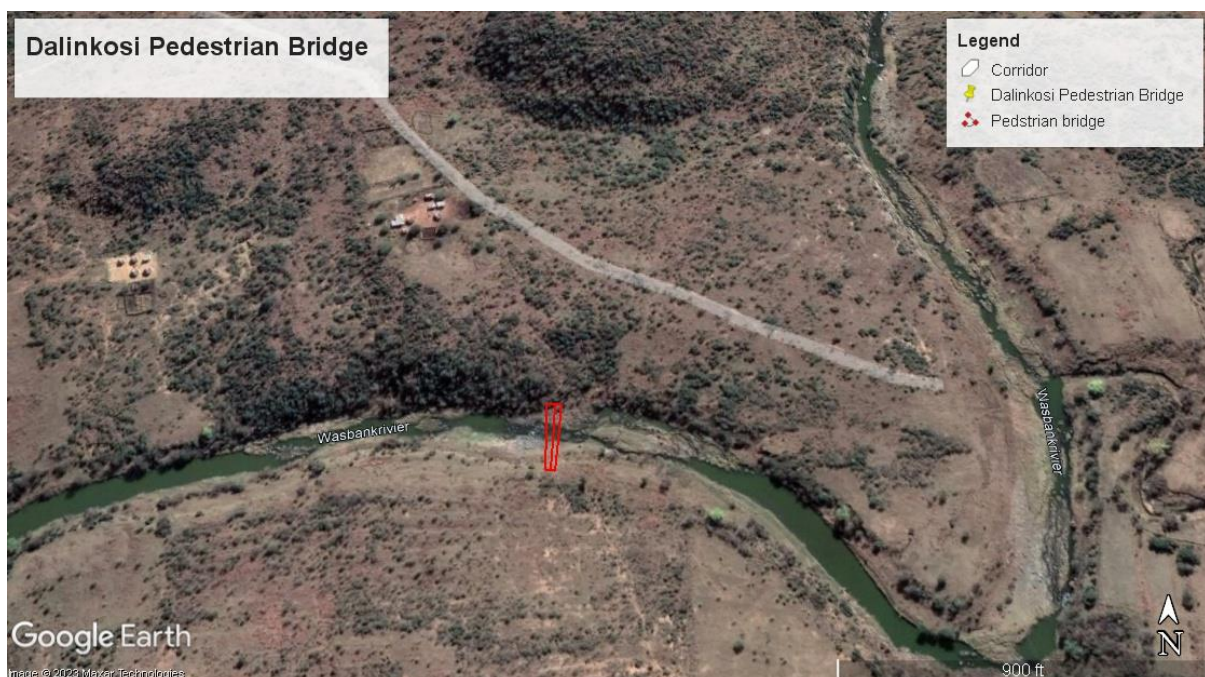


Figure 1: Map showing the location of the proposed pedestrian bridge site.

4.2 Project Description

Alfred Duma Local Municipality is proposing the construction of a pedestrian bridge, approximately 60m long, 1.5m wide. It will be a truss bridge with concrete piers (columns) the construction corridor is 145.63m². The project will require excavation and infilling of material, as well as partial clearance of the vegetation approaching the river.

4.3 Description of proposed activity in line with legislation.

In terms of the National Environmental Management Act No. 107 of 1998 (as amended) Listing Notices GNR 327- 324, in line with Environmental Impact Assessment regulations of 2014 (as amended in April 2017), the proposed project triggers the following listed activities, therefore an Environmental Authorization application is required.

Table 1: Listed Activities Triggered

Legislation	Description and Relevance
Constitution of the Republic of South Africa, (No. 108 of 1996)	Chapter 2 – Bill of Rights Section 24 – Environmental Rights.
National Environmental Management Act (NEMA) (No. 107 of 1998)	<ul style="list-style-type: none"> • Section 24 – Environmental Authorisation (control of activities which may have a detrimental effect on the environment). • Section 28 – Duty of care and remediation of environmental damage. Environmental management principles. • Authorities – Department of Environmental Affairs (DEA) (national) and Department of Economic, Development, Tourism and Environmental Affairs (DEDTEA) (provincial).
GN No. 326 of the 2014 EIA Regulations as amended.	Purpose - regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to EIA, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto.
GN No. 327 of the 2014 EIA Regulations as amended (Listing Notice 1)	<ul style="list-style-type: none"> • Purpose - identify activities that would require environmental authorisations prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA. • The investigation, assessment and communication of potential impact of activities must follow the procedure as prescribed in regulations 19 and 20 of the EIA Regulations published in terms of section 24(5) of the Act.

Activities under Listing Notice 1 that are relevant to this project follow.	
<p>GN No. 327 of the 2014 EIA Regulations as amended in April 2017- Activity No. 19 (i) (a)</p> <p>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 a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving—</p> <p>(a) will occur behind a development setback;</p> <p>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;</p> <p>(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or</p> <p>(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies</p>	<p>The construction of the proposed pedestrian bridge will include more than 10 cubic metres of excavation from the watercourse</p>
<p>GN No. 327 of the 2014 EIA Regulations as amended in April 2017- Activity No. 12</p> <p>The development of—</p> <p>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or</p> <p>(ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs—</p> <p>a) within a watercourse;</p> <p>b) in front of a development setback; or if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse</p>	<p>The proposed pedestrian bridge will be 60m long and 1.5m wide. It will have a construction corridor of 145.63 square metres.</p>

5. APPLICABLE LEGISLATIONS, POLICIES AND GUIDELINES

The legislation that has possible bearing on the proposed project from an environmental perspective is captured in **Table 1**.

An outline of the regulations promulgated in terms of the National Environmental Management Act, 1998 and EIA Regulations of 2014 (as amended), **Listing Notice 1** as of December 2014, as amended in April 2017, require that the proposed activity be subject to an Environmental Basic Assessment process. The list of activities to be conducted in achieving the proposed project is outlined with reference to the list of triggering activities in the NEMA EIA regulations of 2014 (as amended).

5.1. Legislation

The legislation that has possible bearing on the proposed project from an environmental perspective is captured in **Table 1**.

An outline of the regulations promulgated in terms of the National Environmental Management Act, 1998 and EIA Regulations of 2014 (as amended), **Listing Notice 1 and 3** of December 2014, as amended in April 2017, require that the proposed activity be subject to an Environmental Basic Assessment process. The list of activities to be conducted in achieving the proposed project are outlined with reference to the list of triggering activities in the NEMA EIA regulations of 2014 (as amended).

5.2. National Environmental Management Act, Act No. 107 of 1998 (NEMA)

According to Section 2(3) of the National Environmental Management Act (NEMA) (Act No. 107 of 1998),

“Development must be socially, environmentally and economically sustainable”,

Which means the integration of these three factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

NEMA also states that:

“The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people’s common heritage.”

The proposed project requires authorization in terms of NEMA and the Basic Assessment is being undertaken in accordance the EIA Regulations (2014) as amended, that consist of the following:

- EIA procedure - GN No. 326 as amended in 2017 and
- Listing Notice 1 - GN No. 327 as amended in 2017.

The proposed project triggers activities under **Listing Notices 1**, thus subjected to a Basic Assessment process. The listed activities are explained in the context of the project in **Table 1** above.

As a conservative approach, all possible activities that could possibly be triggered by the project were included in the Application Form (included in **Appendix A**) that forms part of this report that will be submitted to the Department of Economic Development, Tourism and Environmental Affairs (DEDTEA).

A refinement of these activities will take place as the Basic Assessment process proceeds.

5.3. National Water Act, Act No. 36 of 1998 (hereafter the NWA)

The purpose of the National Water Act (NWA) (Act No. 36 of 1998) is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which consider amongst other factors:

- Meeting the basic human needs of present and without affecting the needs for future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use;
- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety; and
- Managing floods and droughts.

Part 1 of Chapter 4 (Use of Water) of the NWA sets out general principles for regulating water use. In general, water use must be licensed unless it is listed in Schedule I, is an Existing Lawful Use, is permissible under a General Authorisation, or if a responsible authority waives the need for a licence.

The Minister may limit the amount of water which a responsible authority may allocate. In making regulations the Minister may differentiate between different water resources, classes of water resources.

The project entails the following activities that constitute water uses in terms of Section 21 of the NWA:

- Section 21(c) - Impeding or diverting the flow of water in a watercourse (instream works associated with access roads' crossings and placing towers within the regulated area of a watercourse); and
- Section 21(i) - Altering the bed, banks, course or characteristics of a watercourse (instream works associated with access roads' crossings and placing towers within the regulated area of a watercourse); and separate approval for water uses will be sought from the Department of Water and Sanitation.

5.4. National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (hereafter the NEM: BA)

In terms of the Biodiversity Act, the developer has a responsibility for:

- The conservation of endangered ecosystems and restriction of activities according to the

categorisation of the area (not just by listed activity as specified in the EIA regulations).

- Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all development within the area is in line with ecological sustainable development and protection of biodiversity.
- Limit further loss of biodiversity and conserve endangered ecosystems.

6. NEED AND DESIRABILITY

6.1 Activity

The municipality is faced with the challenge of developing the livelihoods of people in communities, especially rural areas. One of the ways of developing the communities is by ensuring service delivery to the people and ensuring that they have easy access to areas of importance.

The community of Dalinkosi identified an issue that is experienced, preventing easy and safe access to places such as clinics, schools etc. There is a stream that the people in the community cross daily, to access clinics and schools, this becomes hard in instances of heavy rainfall in the rainy season, especially for school children. The river gets very full, and the boulders used to cross the stream gets very slippery, making it near impossible and very dangerous to cross in those conditions. They then proceeded to raise this issue with the Ward councillor of the area to request for a bridge to be constructed. The construction of the pedestrian bridge was therefore agreed upon to make things easier and safer for the community.

The proposed pedestrian bridge will be used by the community of Dalinkosi and neighbouring communities. School children have had to attend a school further from their homes, as it will not require them to cross the river. This means that children need to leave very early in order to make it on time to school. The close by school across the stream is at the risk of closing down as it has very few learners. Therefore, the need for this pedestrian bridge is of great importance as it will ensure that children in the community get to attend the school close by to them and they will no longer have to walk long distances to school.

This runs a risk of reducing the quality of education in the community and education is the key to upgrading the status of the community. Education is an important issue in one's life. It is the key to success in the future and to have many opportunities in our life. Education has many advantages for people. For instance, it illuminates a person's mind and thinking. It helps students to plan for work or pursue a higher education while graduating from university. Having education in an area helps people think, feel, and behave in a way that contributes to their success, and improves not only their personal satisfaction but also their community. In addition, education develops human personality, thoughts, dealing with others and prepares people for life experiences.

The school across the stream are also at risk of closing with more children dropping out or missing out on lessons during periods where they cannot access school. The community have pleaded for a long time for this, for the safety of the community and children. The school which does not require the children to cross the river faces a risk of over population and will not be able to accommodate all the kids on the current infrastructure.

6.2 Location

The location for the proposed activity is the preferred site and the most suitable, as the purpose of this proposed pedestrian bridge is to make lives easier and travelling easier for the community members. The proposed site offers the shortest distance to the school and transport route for the community. It would be a shorter distance for school children to travel to school and workers to get to work. This location was also chosen because it is an existing and known path that community members already use.

7. DESIGN AND SITE ALTERNATIVES

7.1. Site Alternatives (preferred)

The proposed site was chosen because of the already existing informal crossing that community members already use to cross, as well as the informal footpath to the crossing. That portion has already been disturbed and will therefore cause minimum damage to the environment. This site will provide easy access to schools, and transport routes. This proposed site also provides the shortest distance to the primary school across the river. No other alternative was considered as this site was already a route the community uses, there is an existing footpath that the community already uses. Therefore, this area is already disturbed, and it was preferred to choose a site that had already been disturbed, then to

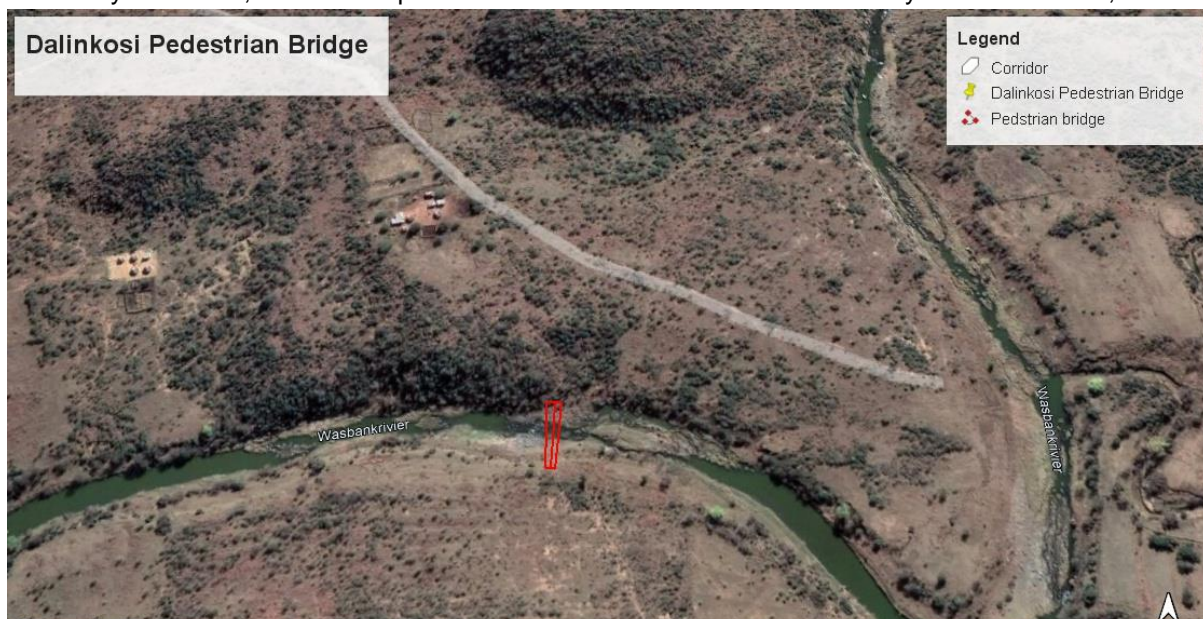


Figure 2: Position of proposed pedestrian bridge.

develop in an untouched, undisturbed area.

7.2 Design and Layout alternatives

There are no design alternatives. This type of bridge is one that will ensure that there is minimum damage to the environment, since the footprint will be smaller. The proposed design is also a structure that will be more stable in that type of environment and for the intended use. The foundation works should be anchored in competent foundation material, ideally competent rock. Anchorage is to be achieved by keying in foundation footings/slabs into rock or by means of a key embedded in rock. The elements and the overall structure should be able to carry design pedestrian, and pavement loading.

The structural steel shall comply with the requirements of SABS 1200 and project specification. Reinforcements shall be hot-rolled and will comply with standard specification for steel bars for concrete reinforcement SANS 920:2011.

A vehicular bridge would impact a larger footprint and would have required much more vegetation clearance, from the stream to both gravel roads on either side of the stream as a road would have to be constructed, that goes to and from the bridge.

7.3 Technology alternatives

Technology to be used will include a TLB, concrete mixer truck, small equipment, and construction vehicles. Other technology used will depend on the tasks that need to be done, as well as the characteristics of that section of the area being dealt with at the time.

7.4 Activity

The proposed development will comprise of the following, to a minimum.

- The clearance of vegetation to create space for the proposed development.
- Establishment of the site camp,
- Excavation,
- Use of concrete will be conducted; some will come pre-casted.
- Temporary diversion of the stream during construction. (However, construction will be recommended to be conducted during winter periods).

7.5 No-go alternative

The no-go alternative will be not constructing a bridge across the stream would result in ongoing deteriorating of the current access. Increase in the high risk of life loss and community endangerment.

During periods of heavy rainfall/ rainy seasons, access will continue to be impossible for the community, when travelling to work or town or when school children want to go to school. This also poses a health risk / safety concern as the stream needs to be crossed by foot to get to the other sides. The local community would continue to have limited access to important road networks continuing the difficulties of accessing jobs, schools, and work opportunities.

Alfred Duma Municipality and a service provider will also not be meeting their social responsibility obligation of improving or the upliftment of life of the community. The school across the stream will eventually close due to a very low number of children attending that school and the school that does not require the crossing of the stream will face very high population and thus affecting the quality of education the teachers can give the children. The school would not be able to accommodate a high number of school children. More importantly the safety of the primary school kids will remain a major issue.

8. STATUS QUO OF THE RECEIVING ENVIRONMENT

The baseline description describes the Biophysical Environment is the primary or foundational layer on which the remaining two sets of layers must feed on in order to ensure sustainability. Geology, soils, and climate form the basic geomorphological relationship which gives rise to hydrological, topographical and biodiversity patterns. Agriculture and mining are included in this sub-base due to their close relationship with the natural environment.

8.1 Rainfall

Rainfall in the region occurs in the summer months (mostly December to February), with a mean annual precipitation of 743 mm (observed from rainfall station 0300454). The reference potential evaporation (ET_o) is approximately 1 895 mm (A-pan equivalent, after Schulze, 2011) and the mean annual evaporation is between 1400 – 1500 mm, which exceeds the annual rainfall. This suggests a high evaporative demand and a water limited system.

8.2 Temperature

Summers are warm to hot, and winters are cool. The mean annual temperature is approximately 23.5 °C in summer and 12.2 °C in the winter months.

8.3 Topography

Generally, the topography land of ULM ranges from flat to gentle rolling slope to hilly and ragged terrain across the municipality. The highest point of the study site for the proposed Dalinkosi Pedestrian Bridge project site is 2928 ft and the lowest point is 2910 ft.

8.4 Vegetation

The vegetation of the study area for the Dalinkosi Pedestrian Bridge project within uThukela District Municipality is described as Income Sandy Grassland. Regional conservation status for the site is Vulnerable for Income Sandy Grassland (Mucina and Rutherford 2006). Based on the KwaZulu-Natal Biodiversity Conservation Plan (KZNBCP) for terrestrial areas, the current study area falls under the Biodiversity Area which is unallocated.

8.5. Geology

Vryheid Formation

The Permian aged Vryheid Formation (Kungurian Stage – 260 million years old: Green and Smith, 2012) comprises predominantly coarse-grained sandstone and siltstones, interbedded with dark shales and coal beds. The Formation is interpreted as “near-shore sandbars” and deltaic deposits that prograde into the ancient Karoo Sea. The latter was located within the central part of the Gondwana Supercontinent (Johnson et al, 2009). Coal can be present, but no significant seams are present in this area.

Karoo Dolerite

Karoo Dolerite, represented by dykes or sills, may be present within this area. This dolerite is part of the Karoo Large Igneous Province (LIP). The Karoo LIP is a sequence of lavas originally up to 4.5 km thick, but which have been eroded to about 1.5 km. This basalt lava was extruded about 184 million years ago as a “Continental Flood Basalt”, a process that has never been witnessed by mankind. This event took place by fissure eruption. This event triggered the break-up of the Gondwana Supercontinent (Hastie et al., 2014).

9. PUBLIC PARTICIPATION PROCESS

The objectives of public participation in an EA process are to provide I&APs’ access to enough information in an objective manner to:

- Ensure transparency throughout the process and to promote informed decision making.
- Assist I&APs to identify issues of concern and providing suggestions for enhanced benefits and alternatives.
- Contribute their local knowledge and experience.
- Verify that their issues have been considered and to help define the scope of the technical studies to be undertaken.
- Comment on the findings of the Basic Assessment, including the measures that have been proposed to enhance positive impacts and reduce or avoid negative ones.

9.1 Stakeholder identification and registered I&APs

I&AP register was compiled, based on the scope and locality of the project, as well as from the pre-application meeting.

- Alfred Duma Local Municipality
- Department of Economic Department, Tourism and Environmental Affairs (DEDTEA) (Uthukela District)
- Department of Water and Sanitation (DWS).
- Ezemvelo KZN Wildlife
- Ingonyama Trust
- AMAFA

The stakeholder's database is included in **Appendix D** of this report.

9.2. Announcement of the Basic Assessment Process

9.2.1 Background Information Document

A Background Information Document (BID) was emailed to the Interested and Affected Parties (I&APs). The BID provided the scope of the proposed development, the triggered activities, as well as the details of providing input. The stakeholders were given 14 days to provide their comments on the BID. The BID and proof of notification are attached in **Appendix D**.

9.2.2 Site Notices

The site notices were placed on the 10th of June 2023 at the proposed site as well as surrounding areas. See **Appendix D** for proof of site notices.

9.2.3 Newspaper Advertisement

A newspaper advertisement was placed in the Ladysmith Gazette on 4 August 2023 and uThukela Eyethu on 11 August 2023 respectively, to notify the general public of the proposed development and the right to register as an I&AP. See **Appendix D** for proof of publication.

9.2.4 Public Meeting

A public meeting was held by the ward councilor with the community, informing them of the proposed development. As the EAP we had another meeting with the ward councilor and he informed us that

there was no need for another meeting informing the public of the proposed project, as they are already aware, and they would only appreciate another meeting when construction is about to commence. Minutes detailing this were compiled and approved by the ward councilor and he also provided us with registers of the previous meeting that was held by him and the community. See **Appendix D** for register and meeting minutes.

10. ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations accompany the Environmental Impact Assessment:

- In accordance with the purpose of Basic Assessment, the report includes detailed specialist investigations on the receiving environment and mitigation measures to assure detrimental impacts are reduced. The environment in the project area was primarily assessed through site visits and assessments, desktop screening, incorporating existing information from previous studies, and input received from authorities and IAPs. A refinement of all maps will also be undertaken with recommendations from specialists, if necessary.
- The development layout will substantially adhere to the layout that was provided and is included in this report.
- Should changes to the layout be made, the EAP and appointed specialists will be provided an opportunity to re-assess the impacts of such changes and amend this report to include said changes and potential impacts; and
- Provision is made for all sensitive environments as identified by the specialists and all recommendations incorporated into the Environmental Management Programme.

11. IMPACT ASSESSMENT

The assessment of impacts below has adhered to the minimum requirements in the EIA Regulations, 2014, and considered applicable official guidelines into account. The issues raised by interested and affected parties are also included and addressed in the assessment of impact. This assessment will also indicate the implications and the impacts of not implementing the activity.

11.1 Methodology

The methodology used to determine the significance of impacts associated with the development was motivated by the Department of Environmental Affairs Series 5 of Impact Significance. This method is known as the systematic method which follows the criteria that includes.

- Extent or spatial scale of the impact.
- Intensity or severity of the impact.
- Duration of the impact.
- Mitigatory potential.

- Acceptability.

The criteria are defined as follows:

- **Nature:** A brief written statement of the environmental aspect being impacted upon by a particular action or activity;
- **Extent:** The area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact. For example, high at a local scale, but low at a regional scale;
- **Duration:** Indicates what the lifetime of the impact will be;
- **Intensity:** Describes whether an impact is destructive or benign;
- **Probability:** Describes the likelihood of an impact actually occurring; and
- **Cumulative:** In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

The criteria to be used for the rating of impacts are provided in **Table 3** below.

Table 2: Criteria to be used for the rating of impacts.

Score	Rating	Description
Consequence Descriptors		
5	High	Function or process of the affected environment is disturbed to the extent where the function or process temporarily or permanently ceases.
4	Moderately High	The affected environment is altered, and the functions and processes are modified immensely
3	Moderate	The affected environment is altered, but functions and processes continue, albeit in a modified way
2	Moderately Low	The impact alters the affected environment in such a way that the natural processes or functions are slightly affected
1	Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
Extent – relates to the extent of the impact		
5	National	Impacts could have an effect that expands throughout a significant portion of south Africa that is a minimum has an impact across provincial borders
4	Regional	Impacts could affect the wider area around the site that is,

		from a few kilometers up to the wider council region
3	Local	Impact could affect the adjacent landowners
2	Site	The impact could affect the whole, or significant portion of the site. developments affected < 100m
1	Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.
Duration – relates to the duration of the impact		
5	Permanent	This is the only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient (i.e., will remain once the site is closed).
4	Long Term	The impact will continue or last for the entire operational lifetime of the development, but will be mitigated by direct human action or by natural processes thereafter (i.e., during decommissioning) (i.e. more than 10 years, or a maximum of 60 years).
3	Medium term	Impact will last up to the end of the development phases, where after it will be entirely negated (i.e., related to each phase development thus less than 10 years).
2	Medium short	The impact will be relevant through to the end of the construction phase (i.e., less than 5 years).
1	Short term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than any of the development phases (i.e., less than 2 years).
Probability – relates to the likelihood of the impact occurring		
4	Definite	It is most likely that the impacts will occur at some stage of the Development. Plans must be drawn up before carrying out the activity (> 90%).
3	Highly likely	There is a possibility that the impact will occur to the extent that provisions must therefore be made (70 – 90%).
2	Possible	The possibility of the impact occurring is very low, either due to the circumstances, design, or experience (40-70%).
1	Highly unlikely	The possibility of the impact occurring is none, due either to the circumstances, design, or experience (less than 40% chance of occurring).

Significance is determined through a synthesis of impact characteristics. Significance is also an indication of the importance of the impact in terms of both physical extent and time scale, and therefore

indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact. Impact significance is expressed as:

Significance = Probability x Consequence (Severity + Extent + Duration)

		CONSEQUENCE (Severity + Spatial Scope + Duration)														
LIKELIHOOD (Frequency of activity + Frequency of impact)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	

No Impact	No impacts	0-9
Low Impact	The impacts are less important, but some mitigation is required to reduce the negative impacts.	10-24
Medium	The impacts are important and requires attention; mitigation is required to reduce the negative impacts.	25-49
Medium to High	The impact is of medium to high importance; mitigation is necessary to reduce negative impacts.	50-74
High	The impacts are of medium to high importance and mitigation is essential to reduce negative impact.	75-89
Extreme	The impact presents a fatal flaw and alternatives must be considered.	90-100

Table 3: Significance rating matrix

Significance Rating	Value	Impact Management Recommendation
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Very High	126-150	Critically consider the viability of proposed projects. Improve current management of existing projects significantly and immediately
High	101-125	Comprehensively consider the viability of proposed projects. Improve current management of existing projects significantly
Medium-high	76-100	Consider the viability of proposed projects. Improve current management of existing project
Medium-low	51-75	Actively seek mechanisms to minimise impacts in line with the mitigation hierarchy.
Low	25-50	Where deemed necessary seek mechanisms to minimise impacts in line with the mitigation hierarchy
Very Low	1-25	Maintain current management and/or proposed project criteria and strive for continuous improvement.

11.2 Risk Assessment

Table 4: Environmental Impact Assessment Rating

IMPACT	SEVERITY	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE	RISK RATING	MITIGATION MEASURE	RISK AFTER MITIGATION
11.2.1 PRE-CONSTRUCTION PHASE								
1. Vegetation clearance during site establishment	5	3	2	4	40	M	Construction activities to be restricted to a limited footprint at the existing site	L
2. Erosion and degradation of sensitive plant communities and associated habitats due to poor planning and design	4	3	2	3	27	M	Erosion to be monitored and corrected, especially after heavy rain. Any areas where erosion and siltation occur to be corrected immediately to avoid increase siltation in the watercourse Excess flows from open surfaces and increased slope areas need to be controlled by erosion control measures	L
11.2.2 CONSTRUCTION PHASE								
CLEARANCE OF INDIGENOUS VEGETATION								
1.Vegetation clearance	4	2	2	4	32	M	Construction activities to be restricted to a limited footprint at the existing site	L
2.Exposure of soils leading to increased runoff, erosion and potential increased sediment into the watercourse	5	3	2	4	40	M	Erosion to be monitored and corrected, especially after heavy rain. Any areas where erosion and siltation occurs to be corrected immediately to avoid increase siltation in the watercourse	L

IMPACT	SEVERITY	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE	RISK RATING	MITIGATION MEASURE	RISK AFTER MITIGATION
							Excess flows from open surfaces and increased slope areas need to be controlled by erosion control measures	
3.Compaction of soils as a result of pedestrian traffic	4	2	2	3	24	L	All activities must be restricted to a demarcated servitude and the loss and damage to vegetation must be minimized. This can further be achieved by limiting areas in which activity occurs	L
4.Potential increase in pollutants washing downstream	4	3	2	3	27	M	Excess flows from open surfaces and increased slope areas need to be controlled by erosion control measures	L
5.Potential proliferation of alien invasive species	3	3	2	3	24	L	No unnecessary vegetation to be removed. Remove all alien and invasive plant species (including weedy annuals) as encountered. All IAPs must be actively always removed from the works area. The use of herbicides is not recommended in or near the watercourse and mechanical removal is required. Stockpiles and spoil sites must be clearly demarcated and kept free of weeds	L
CONSTRUCTION OF TEMPORARY WATER DIVERSION								
1. Changes to the flow regime	5	3	2	4	40	M	Natural flow must be restored and maintained post-construction	L
2. Bed modification	4	2	1	4	28	M	Banks to be properly stabilized and rehabilitated. Care to	L

IMPACT	SEVERITY	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE	RISK RATING	MITIGATION MEASURE	RISK AFTER MITIGATION
							be taken when excavating soil for installation of pedestrian bridge to prevent excessive mobilization of sediments	
3. Reduction in water quality	4	3	1	2	16	L	Erosion to be monitored and corrected, especially after a heavy downpour. Any areas where erosion and siltation occur to be corrected immediately to avoid increase siltation in the drainage line	L
CONSTRUCTION OF PEDESTRIAN BRIDGE								
1. Increased volumes and uncontrolled run-off of stormwater due to hardened surfaces.	5	3	2	3	30	M	The banks must be properly stabilised and rehabilitated	L
2. Erosion, compaction and the potential for increased levels of siltation	4	2	1	3	21	L	Stockpiles and spoil should be located on even surfaces away from the area so as not to cause sediment wash into the system. These soil stockpiles and concrete / building sand must be protected from rain wash using geotextiles or landscaping fabric (eg. hessian), as must all exposed soils	L
3. Changes to the banks or course of the watercourse	4	2	1	4	28	M	Banks to be reshaped to original contours as part of construction phase. Rehabilitation to be implemented as part of the construction phase	L
4. Mixing and casting of concrete	3	1	1	2	10	L	Mixing of concrete should take place in a designated site	L

IMPACT	SEVERITY	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE	RISK RATING	MITIGATION MEASURE	RISK AFTER MITIGATION
							<p>outside of the area and buffers, and be wheel-barrowed in.</p> <p>Mixing trays should be provided and any concrete spilled outside of the demarcated area must be promptly removed and taken to a suitable licensed waste facility</p>	
<p>5. Contamination of stream- with hydrocarbons due to leaks and spillages from machinery, equipment and vehicles and contamination/ eutrophication with litter</p>	4	3	2	3	27	M	<p>The risk of contamination is likely to be short-lived and limited to the construction phase. However, all excess consumables and building materials / rubble must be removed from site and deposited at an appropriate licensed waste facility.</p> <p>Accidental spills of building materials and hydrocarbon must be appropriately contained. The contractor must be in possession of an emergency spill kit (eg. Drizit) that must be complete and available at all times. Topsoil contaminated by hydrocarbons must be treated in-situ or be placed in containers and removed from the site for disposal at a licensed waste facility.</p> <p>Sanitation services are to be provided to construction personnel, and these portable toilets must be cleaned as</p>	L

IMPACT	SEVERITY	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE	RISK RATING	MITIGATION MEASURE	RISK AFTER MITIGATION
							appropriate	
6. Disposal of construction waste in the form of construction rubble, potential hazardous chemicals and general litter	3	3	1	4	28	M	All construction rubble and sediment as a result of the excavation/construction activities must be removed from the drainage line and disposed of at a licensed waste facility. All litter must be stored immediately in closed bins and disposed of at a licensed waste facility. No litter to remain behind following completion of construction activities	L
7. Increased likelihood of dust generation due to exposed soils and earth works activities	4	3	2	4	36	M	Limit the removal of vegetation as far as possible. Moisten the work area with water using a water tanker in order to suppress dust. Keep stockpiles of soil and building materials covered with geotextile or landscaping fabric (eg. hessian)	L
8. Noise and disturbance affecting fauna	5	3	2	3	30	M	The banks must be properly stabilised and rehabilitated	L
9. Pollution (litter)	2	2	4	3	24	L	Regular maintenance by the municipality needs to be done during operational phase, to ensure clean-ups when required and ensure that the pedestrian bridge area remains clean and litter free.	L

11.2.3. OPERATIONAL PHASE

IMPACT	SEVERITY	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE	RISK RATING	MITIGATION MEASURE	RISK AFTER MITIGATION
1. Increased levels of erosion and siltation	2	2	3	2	14	L	Implement as part of routine road maintenance plan, which must include erosion control, weed control and general rehabilitation as and when required. Correction of structure if siltation is excessive	L
2. Poor rehabilitation	2	3	4	2	18	L	Rehabilitation to be implemented during operation phase as a corrective action when and where impacts are identified.	L
3. Invasion of alien species	3	2	3	3	24	L	An alien species management plan should be compiled and the applicant should do regular monitoring and maintenance of the area.	L
4. Pollution (litter)	2	2	4	3	24	L	Regular maintenance by the municipality needs to be done during operational phase, to ensure clean-ups when required and ensure that the pedestrian bridge area remains clean and litter free.	L

12. ENVIRONMENTAL IMPACT STATEMENT

12.1 Negative Potential Impacts

The key impacts associated with the construction of the Dalinkosi Pedestrian Bridge over the River relate to those during the construction period.

The identified impacts such as contaminating the river, the management of erosion and sedimentation, and the clearing of vegetation need to be mitigated by the appointed contractor using legislative requirements and as per EMPr proposed mitigation measures.

These can be best managed by minimizing the clearing of vegetation to the construction footprint, treating the river as a sensitive no-go area and by implementing effective stormwater management measures as well as erosion measures.

The primary negative potential impacts associated with the proposed development in the construction phase are related to the generation of noise on sensitive receptors, creation of visual impacts, disturbance of the soils and stormwater erosion impacts that may materialize as a result of the construction activities.

Since the removal of a 600mm pipe culvert will occur, dust may also be an issue during that period. The construction phase will result in some disturbance, which will be unavoidable due to the presence of construction vehicles and the disturbance of the soil in the area. However, the disturbance will be of short duration and the operational phase will have limited to no environmental impacts. All envisaged environmental impacts can be mitigated so that they cause minimal impact. All construction activity must be confined to the proposed construction footprint area. An ECO must be appointed to ensure implementation of the mitigation measures.

12.2 Positive Impacts

The primary positive impacts relate to the generation of a number of jobs. The construction phase will be associated with positive socio-economic impacts in terms of job creation benefiting the local community employed as construction workers during this phase. It will also improve and benefit the local people by training them and upskill the local community.

By constructing the pedestrian bridge, the movement and accessibility will become easier for the community provide safer maneuvering of the community members.

This will also help to improve other service providers (e.g., police, education, health, social services, etc.) to provide efficiently and effectively services to the Dalinkosi community. Other positive impacts

that may result from the construction of the bridge is it will improve public safety, and improved health and functionality of the aquatic environment may result from this bridge being erected over the river.

13. SPECIALIST FINDINGS AND RECOMMENDATIONS

The findings and recommendations of the specialists and reports of specialised processes have been incorporated in this section.

Terms of Reference – General

*The following general ToR apply to all the EIA specialist studies to be undertaken for the proposed project. All specialist reports adhere to **Appendix 6** of GN No. 326 (7 April 2017).*

1. Address all triggers for the specialist studies contained in the subsequent specific ToR.
2. Address issues raised by IAPs, as contained in the Comments and Response Report, and conduct an assessment of all potentially significant impacts. Additional issues that have not been identified during prefeasibility assessment should also be highlighted to the EAP for further investigations.
3. Ensure that the requirements of the environmental authorities that have specific jurisdiction over the various disciplines and environmental features are satisfied.
4. The general approach to include; desktop studies and site visits, as deemed necessary, to understand the affected environment and to adequately investigate and evaluate salient issues. Indigenous knowledge (i.e. targeted consultation) should also be regarded as a potential information resource.
5. Assess the impacts (direct, indirect and cumulative) in terms of their significance (using suitable evaluation criteria) and suggest suitable mitigation measures. In accordance with the mitigation hierarchy, negative impacts should be avoided, minimised, rehabilitated (or reinstated) or compensated for (i.e. offsets), whereas positive impacts should be enhanced. A risk-averse and cautious approach should be adopted under conditions of uncertainty.
6. Consider time boundaries, including short to long-term implications of impacts for project lifecycle (i.e. pre-construction, construction, and operation).
7. Consider spatial boundaries, including:
 - Broad context of the proposed project (i.e. beyond the boundaries of the specific site);
 - Off-site impacts, and;
 - Local, regional, national or global context.
8. The provision of a statement of impact significance for each issue, which specifies whether or not a pre-determined threshold of significance (i.e. changes in effects to the environment which would change a significance rating) has been exceeded, and whether or not the impact presents a potential fatal flaw or not. This statement of significance should be provided for anticipated project impacts both before and after application of impact management actions.

9. Recommend a monitoring programme to implement mitigation measures and measure performance. List indicators to be used during monitoring.
10. Appraisal of alternatives (including the NO-GO option) by identifying the BPEO with suitable justification.
11. Advise on the need for additional specialists to investigate specific components and the scope and extent of the information required from such studies.
12. Engage with other specialists whose studies may have bearing on your specific investigation.
13. Present findings and participate at public meetings, as necessary.
14. Information provided to the EAP needs to be signed off.
15. Review and sign off on EIA Report prior to submission to DEA to ensure that specialist information has been interpreted and integrated correctly into the report.
16. Sign a declaration stating independence.
17. The appointed specialists must take into account the policy framework and legislation relevant to their particular studies.

13.1 Terrestrial Biodiversity Assessment

The Terrestrial Biodiversity Assessment was compiled by Dr Sindiso Chamane-Nkuna.

13.1.1 Impacts

Three types of impacts were assessed:

- Direct impacts: Impacts occurring directly on the vegetation of the site as a result of the proposed quarry expansion.
- Indirect impacts: Impacts that are not a direct result of the proposed activity but occur away from the original source of impact.
- Cumulative impacts: impacts caused by several similar projects, related strategic actions and existing trends

Phases	Issue	Nature of Impact	Description of Impact
Planning & Design	Unnecessary damage and disturbance to natural vegetation due to poor planning.	Direct, Indirect, cumulative	Erosion and degradation of sensitive plant communities and associated habitats due to poor planning and design (i.e. inappropriate utilization of sensitive systems).
	Loss of endangered and protected vegetation	Direct, indirect, cumulative	Construction may result in the permanent loss of various plant SCC
Construction	Loss of vegetation	Direct, Indirect,	Unnecessary damage

	during construction	cumulative Direct, indirect, cumulative	and disturbance to natural vegetation due to uncontrolled construction activities beyond the required footprint of the project area and associated access roads. Inadvertent or excessive damage and loss of vegetation beyond the footprint of the proposed project boundary
	Disturbance to surrounding wildlife and fauna	Direct, indirect, cumulative	During the construction phase vehicular movement, noise and habitat destruction will disturb animals in the area
		Direct	Poaching of wild animals during construction
		Permanent	Construction may result in the permanent loss of unidentified animal SCC.
Post-construction	Soil erosion due to loss of vegetation cover	Direct, indirect, cumulative	Erosion and degradation of habitats due to poor planning and design (i.e. clearing of vegetation and removal of sand).
	Invasion of alien species	Direct, indirect, cumulative	Allowing invading species to expand will lead to a large-scale alien invasion.
	Poor rehabilitation of moderate and high sensitive areas	Direct, indirect, cumulative	Poor rehabilitation of high and moderately sensitive areas may lead to the permanent degradation of these ecosystems as well as allow invading alien vegetation species to expand.

13.1.2 Recommendation

Various mitigations are recommended (based on the level of sensitivity of the affected area see **Table 8** of the Terrestrial Biodiversity Assessment in **Appendix E**) to reduce the impacts of the proposed Dalinkosi Pedestrian Bridge project on the surrounding natural environment.

Table 5: Sensitivity Mitigation and Management

Sensitivity	Mitigation and Management
High sensitivity areas	Areas of natural or transformed land where a high impact is anticipated due to the high biodiversity value, sensitivity or important ecological role of the area. Areas of high sensitivity include process areas such as rivers, wetlands and streams that are important for ecosystem functioning including surface and ground water dispersal. Development within these areas is highly undesirable and should only proceed with caution as it may not be possible to mitigate all impacts appropriately. Authorisation must be obtained from DWS prior to any construction taking place within the required buffer: 32 m from all water courses. The areas within 32 m from the river were regarded as highly sensitive.
Moderate sensitivity areas	These areas include pristine (undisturbed) and semi-pristine (low level of disturbance) areas as well as areas with high quantities of SCC. Depending on constraints (such as concentrations of protected species, or infrastructure limitations), these areas can withstand a limited loss of, or disturbance to, natural areas. The area with a steep slope leading up to the watercourse is considered moderately sensitive. It is of the utmost importance that erosion mitigation measures are put in place in this section. The areas at the study site that are on steep slope leading to the river are medium sensitive.
Low sensitivity areas	<p>These areas are considered as severely disturbed or transformed by human activities, including cultivation, urban development and rural settlements, as well as degraded areas. These areas are suitable for development and will only require low level mitigations. There were no areas regarded as low sensitive at the study site.</p> <p>During the Planning and Design, construction and Post-Construction Phases of the proposed project, all mitigations outlined below need to be adhered to</p>

Proposed Mitigation: Planning and design phase

- An Environmental Control Officer (ECO) must be appointed to oversee construction activities.
- A plan to actively rehabilitate the area used for construction post-construction needs to be developed.
- Construction activities must be limited to the designated footprint of the project area.
- Where vegetation has been cleared, site rehabilitation in terms of soil stabilisation and re-vegetation must be undertaken.

Proposed Mitigation: Construction phase

- Construction must be conducted during the dry seasons and works during rainy season must consider the high stream flows.
- Construction activities need to be restricted to the areas demarcated by the project plans.
- No indigenous vegetation outside the demarcated project boundaries must be removed.
- Only the approved haul road must be used, and vehicles must not traverse virgin land.
- There should be minimal disturbance to areas in the immediate vicinity as successful vegetation recovery will depend on the remaining vegetation. Construction boundary must be demarcated and vegetation clearing, and topsoil removal limited to these areas.
- Construction activities must be limited to the designated development footprint.
- No poaching of any wild animals will be allowed.
- The development area must again be surveyed prior to construction in order to locate and capture any SCC and relocate them.

Proposed mitigation measures: Operational phase

- All slope areas must be properly stabilized through compaction to ensure proper establishment of a vegetation cover.
- Disturbed areas must be re-vegetated by seeding with plants that are natural to the area.
- An alien removal plan must be implemented and run during operational phase.
- A Rehabilitation Management Plan must be implemented.

The impacts of the proposed Dalinkosi Pedestrian Bridge project on ecological processes would be High and Medium Negative without mitigation but with mitigation the impacts could be reduced to Low Negative. The proposed Dalinkosi Pedestrian Bridge project is recommended, and mitigations outlined in this report need to be adhered to. If the above measures and recommendations are adhered to then it is not expected that there will be any unacceptable impacts on the vegetation of the receiving environment.

13.2 Geotechnical Assessment

The Geotechnical Assessment was conducted by Geotechnical Solutions (Pty) Ltd (Nishen Govender).

13.2.1 Recommendation

Where possible, the lowering of ground levels is to be avoided to reduce the risk of encountering problematic shallow groundwater seepage anticipated to occur intermittently within 1.0m begl. Where this is not feasible, allowance is to be made for suitable subsoil drainage to engineer's detail. Placement of fill layers should be undertaken in layers not exceeding 150mm thick. When placed loose, and compacted using suitable compaction plant to achieve 93% of Modified AASHTO maximum dry density.

If natural ground slopes are steeper than 9 degrees, the fill must be benched into the slope. Terraces should be graded to direct water away from the fill edges, and small earth bunds should be constructed along the crests of fills, to prevent overtopping and erosion of fill embankment slopes. Acceptance and process density control testing of placed fill material should be undertaken at regular intervals during fill construction as part of process and acceptance quality assurance monitoring. Cut and fill slopes in soils should be formed to batters not exceeding 26° and to a height not greater than 2 metres where retaining walls are not provided.

Engineered fill slopes should be over constructed and thereafter trimmed back to the required position. Cuts in highly weathered bedrock should not exceed gradients of 50°. Inspection of cuts in weathered bedrock by a competent engineering geologist or geotechnical engineer may indicate that the angle of cut batter slopes needs to be varied locally to promote stability of the site. Cut and fill heights greater than the heights and configurations specified above would need to be inspected and approved by an engineering geologist or geotechnical engineer. Workers should not enter any excavations deeper than 1.5m that are not shored or battered back as described above, as sidewalls in the low strength soils resembling those encountered on site will be prone to collapse. All excavations must be inspected daily by a competent person and records must be kept. It remains the responsibility of the Contractor/Developer to comply with the current requirements of the Occupational Health and Safety Act.

It is recommended that all foundations be placed on the weathered dolerite rock, where a maximum net allowable bearing pressure of between 500 kN/m² to 1000 kN/m² is considered applicable. Based on the borehole profiles and UCS results, medium hard rock is consistent at a depth of approximately 4.5m below. It is a requirement that prior to casting any concrete in the foundation trenches, all loose material needs to be removed. In order to confirm that all foundation is placed on weathered rock, it is a requirement that all foundation are inspected and approved by a geotechnical specialist such as Gevorkyan Geophysics (Pty) Ltd. All foundations will need to be designed strictly to engineers detail and adequately reinforced taking into consideration the founding conditions of the site.

The site is considered stable for the development from a geotechnical perspective. It is therefore recommended that a geotechnical practitioner be appointed to carry out periodic inspections during construction.

13.3. Floodline Assessment

The Floodline Assessment was conducted by Nature Stamp (Dr Bruce Scott-Shaw and Nick Davis).

13.3.1 Impacts

CONSTRUCTION

- Disturbance of riparian habitat, compaction of soils, sedimentation, proliferation of alien and invasive vegetation
- Increase in sediment laden stormwater runoff from cleared, disturbed areas resulting in the sedimentation and erosion of the Wasbank river and associated riparian habitat of the channelled valley bottom wetland.
- Increased activity of workers and machinery on-site (noise, dust, traffic disturbance)
- Storage of petro-chemicals on

OPERATION

- Erosion and sedimentation of the Wasbank and associated riparian habitat.
- Increased storm water on site leading to soil wash
- Pooling of sub-surface water and prevention of lateral flow.
- General increase in pollution (noise and litter)

13.3.2 Recommendation

The proposed Dalinkosi pedestrian bridge development should employ best practise stormwater management practises, as outlined below –

- Implementation should take place during the dry season wherever possible. Activities should stop during heavy rains.
- Vegetation clearing should be limited as much as possible and plants rescued for rehabilitation.
- Directing clean stormwater towards natural drainage lines, contours and dispersing over grassed, flat areas (preferably the existing watercourses).
- Vehicles and equipment must be kept outside of watercourse buffers and flood extent.
- Vehicles and equipment must be kept clean and serviced off site.
- Staff/workers on-site must be educated on identifying potential erosion areas and best practice guidelines.
- Energy dissipating measures with regards to stormwater management would be installed where necessary to prevent soil erosion.
- The engineer or contractor must ensure that only clean stormwater runoff enters the environment.
- Drainage should be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to properties downstream, of any stormwater discharge points.
- Infrastructure must have the following:

- Completely lined storage infrastructure (concrete bunded area), with the capacity to contain 110% of the total amount of petrochemicals stored within a specific tank;
- Spills must be completely removed from the site;
- Valves / taps to contain or release any spillage collected from storage tanks; and
- Fire extinguisher equipment installed within each facility.

Furthermore, as guided by the DWS, the following soil erosion measures should be put into place –

- Erosion control measures should be put in place to minimize erosion along the construction/implementation areas. Extra precautions must be taken in areas where the soils are deemed to be highly erodible.
- Soil erosion onsite should be prevented at all times, i.e. post- construction activities.
- Erosion measures should be implemented in areas prone to erosion such as near water supply points, edges of slopes etc. These measures could include the use of sand bags, hessian sheets, retention or replacement of vegetation if applicable and in accordance with the EMPr and the biodiversity impact assessment.
- Where the land has been disturbed during implementation, it must be rehabilitated and re-vegetated back to its original state after completion.
- Stockpiling of soil or any other material used during the construction phase must not be allowed on or near slopes, near a watercourse or water body. This is to prevent pollution of the impediment of surface runoff (further details are provided in the EMPr).

In order to reduce the potential impact of spills on site the following must be adhered to:

- Emergency numbers are provided on site – e.g. Spilltech, fire department, ambulance, etc.;
- Spill cleaning kits such as a Drizit kit are available on site;
- All chemicals on site are recorded in the inventory of hazardous substances;
- Equipment, machinery and vehicles are regularly checked and maintained in good order;
- Machinery and equipment maintenance is undertaken in designated areas;
- Drip trays are to be placed underneath machinery and equipment during maintenance;

In the instance of a spill on site the following procedure must be followed:

1. Locate the source of the spill;
2. Stop the spill and prevent further spreading;
3. The appropriate oil sponge, absorbent or spill kit (e.g. DriZit) can then be used to clean and remove the spilled substance(s);
4. Spills from trucks/tractors must be contained within a concreted site area and prevented from spreading;
5. Spilled petrochemicals can then be cleaned up and removed using the appropriate oil sponge, absorbent or spill kit (e.g. DriZit);
6. The spill must be reported to the site manager / supervisor and ECO;

7. Depending on the significance of the spill, the incident may also need to be reported to the DEDTEA and DWS.

Proposed Mitigation Measures:

1. The nearby watercourses are in a modified condition. The surrounding areas should be vegetated to increase the surface roughness and improve the aesthetics at the site.
2. The bridge will be elevated to be outside of the 1:100 year flood extent.
3. Only pillars at the crossing points would be within the flood extent as per their design.
4. Strict adherence to best practice guidelines, spill management and erosion control must be throughout operation of the development.
5. Regular maintenance must be undertaken to ensure that the flood risk is not increased due to blockages by debris.
6. The risk of the proposed development is low assuming adherence to mitigation measures. However, the risk should still be managed through appropriate storm water management and general maintenance.

13.4 Aquatic and Wetland Assessment

The biodiversity (Wetlands, Fauna and Aquatic) was conducted by Mncedi Rainel Nkosi

13.4.1 Impacts

Construction

- Loss of riparian and instream aquatic vegetation through the disturbance, which could result erosion and sedimentation. Sedimentation could negatively impact aquatic biota.
- Storage of petro-chemicals on site and cement may spill into the river.

Post Construction

- Increase in stormwater as a result of the hardened surface

13.4.2 Recommendation

Below are a set of simple guidelines highlighting some common measures to control pollution during construction. These measures should be included in the future EMPr:

- Land disturbance must be minimized in order to prevent erosion and run-off; this includes leaving exposed soils open for a prolonged period of time. As soon as vegetation is cleared (including alien) the area must be re-vegetated;
- Sandbag berms must be created along the banks of the river where work is being carried out to minimize the amount of runoff entering the system in the event of spill.
- Spill kits must be made available and staff trained in the use thereof.
- Control dust through fine water sprays used to dampen down the exposed surfaces;
- Cover skips and trucks which are loaded with construction materials;

- Stockpiles of building materials must be located where they will not be washed into the rivers or surrounding environment.
- Segregate, tightly cover and monitor hazardous substances to prevent spills and possible site contamination, particularly hydrocarbons.
- Waste water must not be allowed to come into direct contact with exposed soils or run across the site. Vehicles and machinery may not be washed on site. All waste water must be collected in a sealed container and disposed of by an approved waste contractor. Waybills proving correct disposal must be retained for inspection.
- No materials may be burned on site. These are only a few of the basic practices which must be incorporated into construction of the causeways. This is a project which has the potential to result in contamination of a sensitive environment upon which the local communities are dependent. The significance of this must not be overlooked when the final decision is being made and procedures are being drafted.

13.5 Paleontological Assessment

The Paleontological Assessment was conducted by Mr Alan Smith

13.5.1 Impacts

The chance of fossils being found on this site is Low, but not Zero. A “Chance Find Protocol” has been included to cover this eventuality. No further palaeontological work is required.

13.5.2 Recommendation

The chance of fossils being found on this site is **Low**, but not **Zero**. A “**Chance Find Protocol**” (**Section 8**) has been included to cover this eventuality. No further paleontological work is required, unless triggered by the “**Chance Find Protocol**” in which case a suitably qualified paleontologist must be consulted. The “Chance Find Protocol” must form part of the Environmental Management Programme (EMPr) for the site.

“Chance find protocol”

This Chance Find Protocol must be included in the site EMPr.

If any fossils are found, a Paleontologist must be notified immediately by the ECO and/or EAP and a site visit must be arranged at the earliest possible time with the Paleontologist.

In the case of the ECO or the Site Manager becoming aware of suspicious looking paleo-material:

- The construction must be halted in that specific area and the Paleontologist must be given enough time to reach the site and remove the material before excavation continues.
- Mitigation will involve the attempt to capture all rare fossils and systematic collection of all fossils discovered. This will take place in conjunction with descriptive, diagrammatic, and photographic recording of exposures, also involving sediment samples and samples of both

representative and unusual sedimentary or biogenic features. The fossils and contextual samples will be processed (sorted, sub-sampled, labeled, and boxed) and documentation consolidated, to create an archive collection from the excavated sites for future researchers.

14. EAP RECOMMENDATION

The following objectives and outcomes must be considered for this project:

There are no anticipated long-term negative impacts on the environment once construction is complete, specifically within the stream and the normal flows. The critical mitigation and practice responsible construction, 'best practice' with regards to housekeeping on site during construction (outlined within the EMPr) and enforce the polluter pays principle. The applicant / contractor must be responsible for their actions on site during construction and the rehabilitation of the site post construction.

Outcomes:

To promote sustainable development. Create infrastructure and an environment that is healthy and sustainable for future generations to come.

The proposed development is achievable. The specialist studies that have been done are proof that this project is feasible in this particular proposed area. All factors have been considered and have been accounted for. Similar projects have been done in the Municipality and the expertise and technology required to undertake this construction of the proposed development exists. All possible measures will be taken to ensure that area does not deteriorate further. Therefore, the proposed development is supported from an environmental perspective, as the overall benefit to the environment will be significant compared to what exists at present.

The EIA process for the Dalinkosi Pedestrian Bridge Proposal has been undertaken in accordance with the EIA Regulations published in GN No. R.326 and R. 327 of 2014 as amended.

To ensure environmental protection, the Dalinkosi Pedestrian Bridge will be constructed and operated in an environmentally sustainable manner. The developers will ensure that all applicable legislation is considered during the construction of the proposed development and any conditions of the Environmental Authorization or other Authorizations are carried through to the EMPr, prior to construction commencing.

The EMPr (**Appendix F**) must be implemented from pre-construction to full operation of the Dalinkosi Pedestrian Bridge to achieve all set environmental objectives and targets whilst meeting all legislative requirements. The implementation of an EMPr for the life cycle phases of the project is considered to be vital in achieving the appropriate environmental management standards.

In addition, the following key conditions should be included as part of the authorization:

- The management of the proposed activities must adhere to the mitigation measures outlined in the Environmental Management Programme (EMPr) included in the BAR.
- The management of the proposed activities must adhere to the mitigation measures outlined in the Specialists Assessment Reports included in the BAR.
- Vegetation will be trampled to access sites and removed in demarcated areas to facilitate construction. Both disturbance and removal must be strictly controlled and minimised to as small an area as is required.
- Site demarcation to follow accepted best practice and to be done by a suitably qualified person before the construction phase.
- Should distinct layering be present in sub-soils, these different soil types must be stockpiled separately and not mixed with different types. Replacement of sub-soil must be in reverse order of when they were excavated and be as close to the original as possible in both layering and compaction.
- After completion of the Works the site should be monitored for the presence of alien plant species and managed if present.
- Design specifications must be strictly adhered to, especially with regards to mixing proportions, concrete strengths and tie-in depths and lengths.
- Ensure that all employees are aware of the potential for fires and the damage that could be caused.
- Smoking and cooking to be prohibited on site and must take place at designated times at designated sites that have been approved as fire safe. Ensure that a fire response procedure is in place and that all dry season work is organized in liaison with the landowners so that it fits into their firebreak/fire protection programme.
- All mixing of mortar or concrete to take place in mixing trays with underlying plastic as well.
- Contaminated water is not to be discarded on site, into the river or into the channel. All waste and excess material is to be removed from site daily and dumped at a pre-determined site specifically for this purpose.
- All site employees to undergo environmental induction training.
- The EMPr must be followed with regards to sanitation facilities, waste management, noise and site management.

I also recommend that this project be approved by the Competent Authority (EDTEA) so as to ensure that the needs of the community are met.

Proposed Monitoring and Auditing

- The contractor must sign that he/she has read and understands the EMPr.
- An Environmental Control Officer (ECO) must be appointed prior to construction commencement to conduct pre-construction and post construction inspections.

- The ECO must conduct monthly audits for the duration of the construction and send report to the Competent Authority: Compliance Inspectorates.
- The Environmental Control Officer (ECO) is responsible for the implementation of the EMPr during the construction phase and liaison between the Applicant and the Contractor. The following tasks fall within his / her responsibilities:
- Be aware of the findings and conclusions of the Environmental Impact Assessment and the conditions stated within the Authorisation.
- Be familiar with the recommendations and mitigation measures of the EMPr.
- Conduct monthly audits of the construction site according to the EMPr and Environmental Authorisation.
- Educate the construction team about the management measures of the EMPr and Environmental Authorisation.
- Regular liaison with the construction team and the project leader / engineer.
- Responsible for keeping records of compliance as well as records of all environmental incidents and complaints register.
- Recommend corrective action for any non-compliance issues as well as good compliance with the EMPr.
- The contact numbers for the Contractor and the ECO shall be made available on-site to affected parties / complainants. This will ensure open channels of communication and prompt response to queries and claims.

A monitoring programme will be implemented for the duration of the construction phase of the project. This programme will include:

- a.) Two weekly audits during the first month where after monthly audits will be conducted by the ECO, which are according to the EMPr and conditions of the Environmental Authorisation. These audits can be conducted randomly and do not require prior arrangement with the project manager.
- b.) Compilation of an audit report with a rating of compliance with the EMPr. This report will be submitted to the relevant authorities, the Department of Economic Development, Tourism and Environmental Affairs (EDTEA).
- c.) Proper and continuous liaison between the Applicant, the Contractor and other stakeholders must take place to ensure all parties are properly always informed

15. CONCLUSION

Key findings of the impact assessed to potentially arise due to the construction identified by the Basic Assessment Process. The impacts are categorised into positive and negative impacts. The negatives that were assessed to have significant impacts may have been assessed as detrimental, however,

application of the mitigation measures reduces the impact.

The small scale of the proposed activity means that the impact will not be felt much beyond the immediate footprint of the bridge if properly managed via the stipulated mitigation measures. The area is substantially transformed by human use, alien species invasion and the presence of an informal crossing already present at the site.

The proposed development is not expected to have major environmental impacts that cannot be mitigated. Environmental Impacts that will possibly be experienced can be reversed with proper mitigation measures that have to be implemented correctly, with the help of the ECO.

This development will particularly be beneficial to the local community as the risk of getting injured or drowning when crossing the river, will be minimized. It will especially be safe for school children who cross the river daily when travelling to school.

The proposed development will result in no unacceptable biophysical and socio-economic impacts, after mitigation. No (post mitigation) impacts of high negative significance will occur as a result proposed development either during the construction or operational phase. Negative impacts on the socio-economic environment are mainly limited to the construction phase and will be of low to very low negative significance with mitigation measures.

The proposed development will see the changes in the topography of the area with extensive cut and fill activities. Practical lessons learnt from similar and adjacent developments have been incorporated into the EMPr to minimise wetland, vegetation, geological and topographical impacts, most specifically those pertaining to erosion control.

An alien invasive eradication programme is to be implemented in line with vegetation specialist recommendation.

The proposed development can therefore be supported from an environmental perspective, provided the recommendations on this Assessment report and EMPr are implemented.

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