Proposed change of the approved bridge and erosion control structure along the eastern edge of the channel adjacent to BUCO, City of Mbombela, Mpumalanga Province

Draft Environmental Authorisation Amendment Report

26 May 2022

CORE Environmental Services	
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EXECUTIVE SUMMARY

BUCO Hardware located at 4 Old Pretoria Road in Mbombela is currently experiencing severe traffic congestion when delivery trucks deliver stock to the BUCO stockyard east and across from the tributary of the Crocodile River. This stockyard is accessed by means of a single lane bridge on the northern edge of the property. As space within the stockyard is limited, traffic flow of other delivery trucks is backed up as the truck in the stockyard must firstly make a U-turn and exit via the same single lane bridge before the other delivery trucks can enter the stockyard. To relieve this traffic congestion, the owner of the building occupied by BUCO Hardware, Sommereg Beleggings (Pty) Ltd (hereafter Sommereg Beleggings), proposed to construct an additional bridge for delivery trucks to exit the stockyard. To prevent further erosion on the eastern edge of the stream, Sommereg Beleggings also proposed to install an erosion protection structure (concrete wall) along the areas prone to erosion.

An Environmental Authorisation Application was submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) and Environmental Authorisation (EA) for the above activities were received on 31 May 2018. In line with the approved Environmental Authorisation, pedestrians would have crossed the watercourse by means of using the approved bridge structure, however, since the approval of the EA, BUCO have expanded and requires more office space. This space has been allocated across the watercourse, within the buildings located directly adjacent and east of the watercourse. BUCO would therefore like to ease access between the newly acquired offices and the BUCO building by means of establishing the pedestrian crossing to the south of the area previously assessed and approved. The pedestrian bridge will consist of a cross over only, and will therefore only affect the banks of the watercourse.

Sommereg Beleggings has appointed Core Environmental Services (Pty) Ltd, as independent environmental consultants and impact assessors, to apply for the amendment of the Environmental Authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). Core Environmental Services is familiar with the project area and is independent in the assessment of impacts and assisting stakeholders to contribute to the environmental assessment process.

Following the assessment of the impacts associated with moving the pedestrian bridge upstream, it was assessed that all of the impacts are considered to be of low to very low significance. In fact, the proposed project will have a positive impact on the socio-economic environment as summarized below:

IMPACT	SIGNIFICANCE BEFORE MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION MEASURES
Construction Phase Impacts		
Biodiversity Impact	Low	Very Low
Sedimentation and Erosion	Medium	Low
Impact on surface water	Medium	Low
Visual Impact	Low	Very Low
Noise Impact	Low	Very Low
Safety Impact	Low	Very Low
Socio-Economic Impact	Low	Medium (+)

Operational Phase Impacts		
Biodiversity Impact	Low	Very Low
Hydrology	Medium	Low
Socio-economic Impact	High (+)	High (+)

Recommendations have however been made to address the impacts which could affect the biophysical and socio-economic environment. It is recommended that pro-active measures are taken to minimise the spread of alien invasive vegetation. Recommendations for the mitigation of impact are included within Section 6 and also the Draft Environmental Management Plan attached.

It is the opinion of the EAP that the existing Environmental Authorisation be amended to include the proposed revisions, as the impact on the biophysical environment caused by the proposed amendment, is of low to very low significance.

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ABBREVIATIONS

BAR	Basic Assessment Report
CBA	Critical Biodiversity Area
EA	Environmental Authorisation
GNR	General Notice Regulation
I&AP	Interested and Affected Party
LIA	Late Iron Age
MDARDLEA	Mpumalanga Department of Agriculture, Rural Development, Land and Administration
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Agency
PPP	Public Participation Process
SACAA	South African Civil Aviation Authority

1. OVERVIEW OF THE PROJECT

1.1 Introduction

BUCO Hardware located at 4 Old Pretoria Road in Mbombela is currently experiencing severe traffic congestion when delivery trucks deliver stock to the BUCO stockyard east and across from the tributary of the Crocodile River. This stockyard is accessed by means of a single lane bridge on the northern edge of the property. As space within the stockyard is limited, traffic flow of other delivery trucks is backed up as the truck in the stockyard must firstly make a U-turn and exit via the same single lane bridge before the other delivery trucks can enter the stockyard. To relieve this traffic congestion, the owner of the building occupied by BUCO Hardware, Sommereg Beleggings (Pty) Ltd (hereafter Sommereg Beleggings), proposed to construct an additional bridge for delivery trucks to exit the stockyard. To prevent further erosion on the eastern edge of the stream, Sommereg Beleggings also proposed to install an erosion protection structure (concrete wall) along the areas prone to erosion.

An Environmental Authorisation Application was submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) and Environmental Authorisation (EA) for the above activities were received on 31 May 2018. In line with the approved Environmental Authorisation, pedestrians would have crossed the watercourse by means of using the approved bridge structure, however, since the approval of the EA, BUCO have expanded and requires more office space. This space has been allocated across the watercourse, within the buildings located directly adjacent and east of the watercourse. BUCO would therefore like to ease access between the newly acquired offices and the BUCO building by means of establishing the pedestrian crossing to the south of the area previously assessed and approved. The pedestrian bridge will consist of a cross over only, and will therefore only affect the banks of the watercourse.

Core Environmental Services was subsequently appointed as an independent Environmental Consultant, to apply for the amendment of the Environmental Authorisation by means of conducting a Part 2 Environmental Authorisation Amendment Process in accordance with GNR 982, 2014 (as amended in 2017).

1.2 **Location**

The project area is located adjacent to BUCO Hardware store (4 Old Pretoria road, Mbombela), situated along the Old Pretoria Road, on the property Nelspruit 312 JT, within Mbombela in Mpumalanga Province (SG Code: T0JT00000000031200000).

The project site falls under the jurisdiction of Ward 16 of the Mbombela Local Municipality within the Ehlanzeni District Municipality and is zoned as private open space (refer to figures 1-1 and 1-2).
Coordinates of the area where the bridge is proposed and approved:
Latitude: 25^0 28’ 8.70” S
Longitude: 30^0 58’ 8.43” E

Co-ordinates of the linear activity (area where erosion protection structures are to be installed as approved):

Starting point of the activity
Latitude: 25^0 28' 7.67" S
Longitude: 30^0 58' 9.39" E
Mid-point of the activity
Latitude: 25^0 28' 8.11" S
Longitude: 30^0 58' 9.00" E
End-point of the activity
Latitude: 25^0 28' 8.57" S
Longitude: 30^0 58' 8.61" E

The pedestrian bridge is proposed at the following coordinates:
Latitude: 25°28'10.01"S
Longitude: 30°58'8.52"E

Please refer to the locality map below, Figure 1. The Layout Map is attached as Appendix A.

FIGURE 1: LOCALITY MAP – PROPOSED AMENDMENT OF BUCO BRIDGE, LOCATION OF PROPOSED PEDESTRIAN BRIDGE, CITY OF MBOMBELA, MPUMALANGA

1.3 Details of the EAP

Ms. Anne-Mari White, is an Environmental Specialist, who started her studies at the North-West University (NWU) and completed her Bachelor of Science: Environmental Management at the University of South Africa (UNISA) in 2007. Ms. White is registered with the Environmental Assessment Practitioners Association of South Africa (EAPASA Reg No: 2020/602) as well as the South African Council for Natural Scientific Professionals as a Certificated Natural Scientist (Reg. No 300067/15). In addition to her qualification, she completed short courses in soil classification and wetland delineations (Terrasoil Science), Geographic Information Systems (University of KwaZulu-Natal), and Environmental Impact Assessments (NWU).

Ms. Edmari Lewis, is an Environmental Consultant, who holds a BSc. Honours Degree in Environmental Science, specialising in Geography and Environmental Management from the North-West University. She completed various courses with specific focus on the National Environmental Management Act, Waste Act, Water Act, Air Quality, Environmental Audit, and ISO14001. Ms. Lewis is registered with the Environmental Assessment Practitioners Association of South Africa as a Candidate (EAPASA Reg No: 2021/3452).

1.4 Policy, Legal and Administrative Framework

TABLE 1: LEGISLATION APPLICABLE TO THE PROJECT

Applicable legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments considered	Project application and type (permit / licence / authorisation / comment)
The Constitution of South Africa, Act No. 108 of 1996	**Sommereg Beleggings** will be required to adhere to the Environmental Management Programme (EMPr) requirements to ensure that social and environmental management considerations are considered and implemented. As per Section 25 the Constitution, a public participation process (PPP) was and will continue to be undertaken, as this is considered to be an essential mechanism for informing stakeholders of their rights and obligations in terms of the project and amendment proposed.
National Environmental Management Act, 1998 (Act No. 107 of 1998)	Environmental Authorisation was obtained in May 2018. As an amendment of the EA is required, the existing EA will have to be amended by means of conducting a Part 2 EA Amendment Process as

	regulated within GNR982 of 2014 (as amended in 2017).
National Biodiversity Act, 2004 (Act No. 10 of 2004)	The act provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resource; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith. The National Biodiversity Act, 2004, must therefore be considered prior to the clearance of vegetation to minimise the impact on the terrestrial biodiversity.
Occupational Health and Safety Act, 1998 (Act No. 85 of 1998)	The Act provides for the health and safety of people at work and for the health and safety of people using plant and machinery. During establishment, work must be conducted with strict adherence to the Occupational Health and Safety Act 85 of 1998.
National Heritage Resources Act, 1999 (Act No 25 of 1999)	This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations. Should any other items of significance be discovered during establishment, a Heritage Specialist must be contacted immediately, and work must cease until confirmation from the Specialist is received. For this reason, the applicant must adhere to the regulations stipulated within the National Heritage Resources Act, 1999.

1.5 National Environmental Management Act 107 of 1998

In accordance with the National Environmental Management Act 107, of 1998, the following listed activities was triggered and approved by the DARDLEA on 31 May 2018.

GNR 983, 2014 (as amended in 2017), 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 (i) a watercourse;
More than 10 cubic metres of sand/soil and/or silt will be moved filled or removed from a watercourse.

It must be noted that the pedestrian bridge by itself does not constitute a listed activity as less than $10m^3$ of sand, rock or pebbles will be filled, excavated or moved during the construction process and for this reason the EA Amendment process is undertaken to amend the existing Environmental Authorisation (EA) issued in 2018.

1.6 Description of the project

In May 2018, EA was received from the DARDLEA for the following:

- Construction of a bridge to provide an exit for delivery trucks delivering goods to the stockyard;
- An erosion protection structure in areas prone to erosion.

The change in layout will entail the following:

- A small pedestrian bridge crossing the watercourse further upstream (south) from the area originally investigated and approved, to ease movement between the newly acquired offices and the BUCO Building.

The pedestrian bridge will have the following dimensions:

- Length of bridge: **13m**
- Width of bridge: **1,2m**
- Height of bridge: **2m**

1.7 Need and Desirability

Previously, pedestrians would have crossed the watercourse by making use of the approved bridge structure, however, since the approval of the Environmental Authorisation, BUCO have expanded and requires more office space. This space has been allocated across the watercourse, within the buildings located directly adjacent and east of the watercourse. BUCO would therefore like to move the pedestrian crossing to a location further upstream for ease of movement between the newly acquired offices and the BUCO building.

2. PUBLIC PARTICIPATION PROCESS

The purpose of this chapter is to provide an outline of the public participation process (PPP) to date and the way forward with respect to the EA Amendment process.

Consultation with the public forms an integral component of the EA process. This process enables Interested and Affected Parties (I&APs) (e.g. directly affected landowners, national-, provincial- and local authorities, and local communities etc.) to raise their issues and concerns regarding the proposed activities, which they feel should be addressed in the EA Amendment process. The PPP has thus been structured such as to provide I&APs with an opportunity to gain more knowledge about the proposed amendment, to provide input through the review of documents/reports, and to voice any issues or concerns at various stages throughout the process.

I&APs were identified during the initial public participation phase of the project as well as during the amendment phase. All the parties identified as an I&AP (surrounding landowners, relevant departments, stakeholders, local and district authorities) have automatically been registered in the I&APs database for the project. The registered I&AP list is attached as **Annexure C.1.**

The draft Environmental Authorisation Amendment Report will be made available for public review from June 2022 – July 2022.

To date no comments have been received by I&AP's.

3. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The description of the affected environment below draws on existing knowledge from published data, previous studies, specialist investigations, site visits to the area and is used to understand the possible effects of the proposed project on the environment.

3.1 Topography

The topography of the Mbombela municipal area ranges from approximately from 2000 m -200m above mean seal level (amsl) in a west-eastern direction across the municipality. The Mbombela CBD lies at approximately 665 m amsl. The site is at an elevation of approximately 600 m amsl.

3.2 Climate

The study site and the surrounding areas are characterised by a humid sub-tropical climate with mild winters and warm summers. The average daily temperature fluctuates from 6^{o}C in winter (June-July) to 29^{o}C in summer (January-February). Generally, Mean Annual Precipitation is approximately 800mm. The rainfall regime is typical of savanna regions, consisting of short, intense storm events during the rainy season. The highest rainfall figures are recorded in December and January.

3.3 Geology and Soils

A large portion of the area is underlain by the Granite Group, which covers most of the Central, Northern and Eastern areas. It has highly permeable and erodible, colluvial sands and residual soil overlying granitic bedrock (Potassic Gneiss and Migmatite), estimated to be between 2.99-3.10 billion years old. The area north of Mbombela is underlain by dolomite of the Chuniespoort of the Transvaal foundation (approx. age 2.55-2.20 Ga). The western part has a more complex geology with rock types such as Shale, Dolomite, Quartzite, Andesite, Ultramafic rocks and Gneiss. The aforesaid Dolomitic rocks give rise to karst features, with the most notable one being the 1.8 km Sudwala Caves (IDP, 2016-2017).

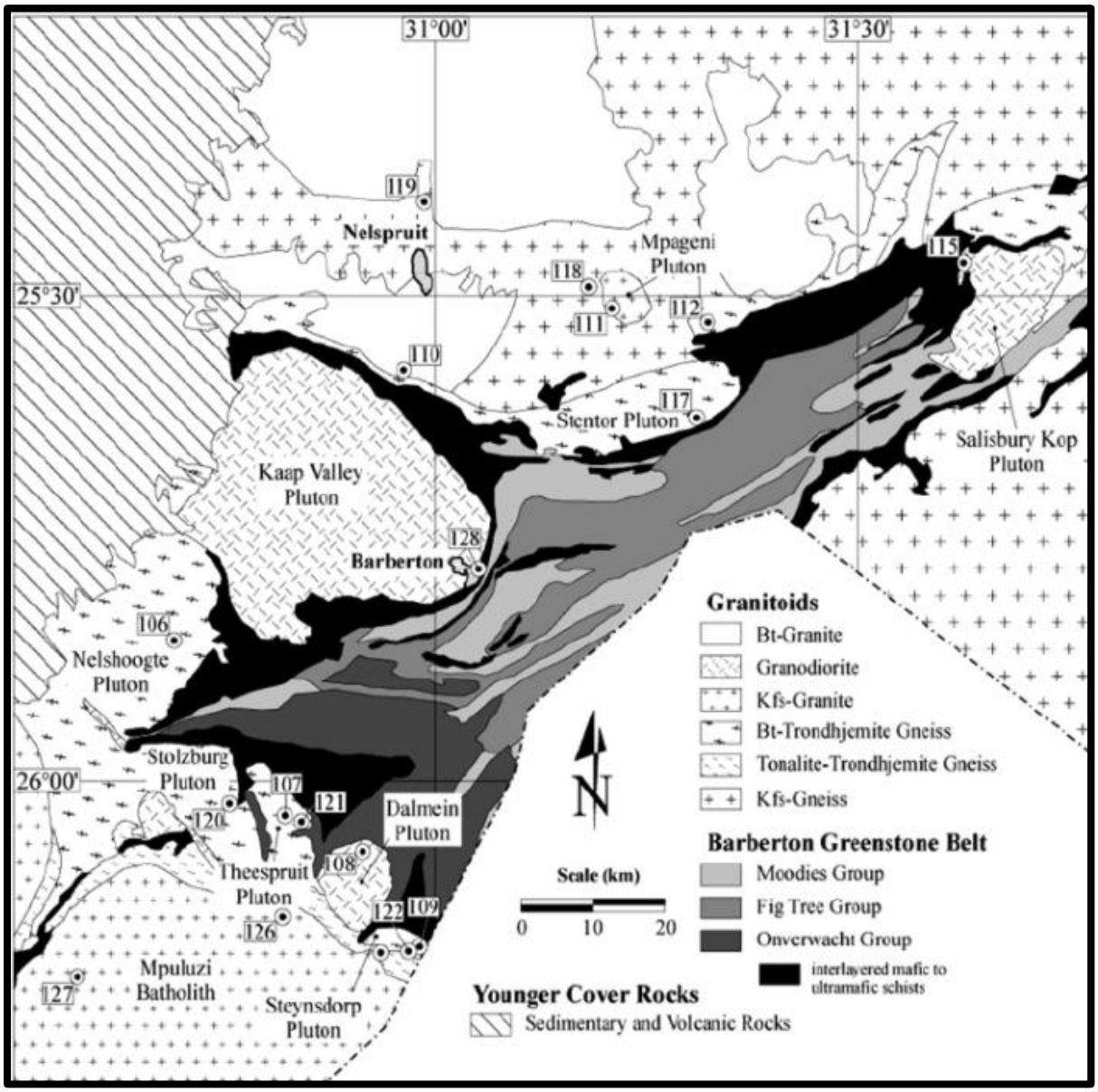

FIGURE 2: GEOLOGY OF THE AREA

3.4 Ecology

The site is located within an industrial area, with warehouse-type industries occurring all around the site and a railway line passing the northern boundary of the site in an east-west direction. Thus, the original natural ecological characteristics of the site have been completely transformed. The ecological integrity assessment indicated that the watercourse has been "Critically Modified" in accordance with the Habitat Integrity Assessment conducted. The natural habitat and biota have been lost completely and a critical and irreversible loss of ecosystem functioning has occurred. Due to the nature of the surrounding landscape transformation, the modification and removal of habitat and the existing disturbance regime adjacent to the stream, the aquatic system has no biodiversity value and is of low ecological importance and sensitivity.

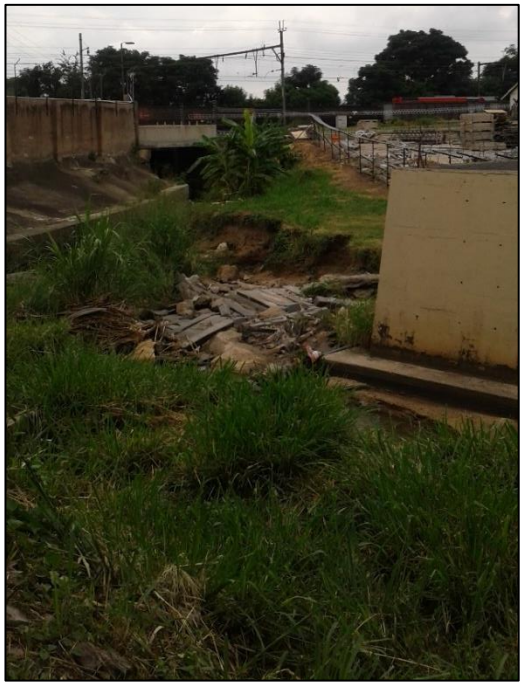

FIGURE 3: PHOTOS INDICATING THE CURRENT ECOLOGICAL CONDITION OF THE PROPOSED SITE

3.4 Land use

The proposed site is located within an urban area. However, the proposed bridge will cross a tributary of the Crocodile River. The proposed area is therefore designated as "private open space".

3.5 Economy

Mbombela Local Municipality has a GGP value of R 73 billion, which makes up 12.2% of the total GGP of Mpumalanga. The main sectors are finance and business sector (22%) manufacturing (17%), general government services (17%) as well as trade and accommodation (13%) (IDP, 2016-2017). Mbombela Local Municipality has experienced a decreased growth rate since 2007. The municipality's growth rate is approximated at 2%, which in turn means that the municipality has not recovered from the recession as of 2011. Mbombela has an unemployment rate of 28.14%. Unemployment is generally high amongst youth, women and people with disabilities (IDP, 2016-2017).

4. METHODOLOGY OF ASSESSING THE SIGNIFICANCE OF IMPACTS

This section outlines the method used for assessing the significance of the potential environmental impacts associated with the proposed amendment.

For each impact, the EXTENT (spatial scale), MAGNITUDE and DURATION (time scale) would be described, as shown in **Table 2**. These criteria are then used to determine the SIGNIFICANCE of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The mitigation described in the Report represents the full range of plausible and pragmatic measures but does not necessarily imply that they would be implemented.

The following tables show the scale used to assess these variables and defines each of the rating categories.

TABLE 2: ASSESSMENT CRITERIA FOR THE EVALUATION OF IMPACTS

Criteria	Category	Description
Extent or spatial influence of impact	**Regional**	Beyond a 30km radius of the candidate site.
	Local	Within a 30km radius of the candidate site.
	Site-specific	On site or within 100 m of the candidate site.
Magnitude of impact (at the indicated spatial scale)	**High**	Natural and/ or social functions and/ or processes are *severely* altered
	Medium	Natural and/ or social functions and/ or processes are *notably* altered
	Low	Natural and/ or social functions and/ or processes are *slightly* altered
	Very low	Natural and/ or social functions and/ or processes are *negligibly* altered
	Zero	Natural and/ or social functions and/ or processes remain *unaltered*
Duration of impact	**Long-term**	More than 10 years after construction
	Medium-term	Up to 5 years after construction
	Construction-term	Up to 3 years

The SIGNIFICANCE of an impact is derived by taking into account magnitude, duration and extent of each impact. The criteria employed in arriving at the different significance ratings is shown in Table 3.

TABLE 3: DEFINITION OF SIGNIFICANCE RATINGS

Significance ratings	Level of criteria required
High	• High magnitude with a regional extent and long-term duration • High magnitude with either a regional extent and medium-term duration or a local extent and long-term duration • Medium magnitude with a regional extent and long-term duration
Medium	• High magnitude with a local extent and medium-term duration • High magnitude with a regional extent and construction period or a site-specific extent and long-term duration • High magnitude with either a local extent and construction period duration or a site-specific extent and medium-term duration • Medium magnitude with any combination of extent and duration except site specific and construction period or regional and long term • Low magnitude with a regional extent and long-term duration
Low	• High magnitude with a site-specific extent and construction period duration • Medium magnitude with a site-specific extent and construction period duration • Low magnitude with any combination of extent and duration except site specific and construction period or regional and long term • Very low magnitude with a regional extent and long-term duration
Very low	• Low magnitude with a site-specific extent and construction period duration • Very low magnitude with any combination of extent and duration except regional and long term
Neutral	• Zero magnitude with any combination of extent and duration

Once the significance of an impact has been determined, the **PROBABILITY** and **CONFIDENCE** of this impact are determined using the rating systems outlined in **Table 4** and **Table 5.** The significance of an impact should always be considered in concert with the probability of that impact occurring. Lastly, the **REVERSIBILITY** of the impact is estimated using the rating system outlined in **Table 6.**

TABLE 4: DEFINITION OF PROBABILITY RATINGS

Probability ratings	Criteria
Definite	Estimated greater than 95 % chance of the impact occurring.
Probable	Estimated 5 to 95 % chance of the impact occurring.
Unlikely	Estimated less than 5 % chance of the impact occurring.

TABLE 5: DEFINITION OF CONFIDENCE RATINGS

Confidence ratings	Criteria
Certain	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.
Sure	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.
Unsure	Limited useful information on and understanding of the environmental factors potentially influencing this impact.

TABLE 6: DEFINITION OF REVERSIBILITY RATINGS

Reversibility ratings	Criteria
Irreversible	The activity will lead to an impact that is in all practical terms permanent.
Reversible	The impact is reversible within 2 years after the cause of the impact is removed.

5. ENVIRONMENTAL IMPACT ASSESSMENT

The impacts on the biophysical and social environment were assessed during the initial Environmental Authorisation Process and it was found that all impacts could be mitigated to be of low to very low significance. The assessment included within Section 5 below, focuses on the impacts of moving/constructing the pedestrian bridge to the south of the area originally investigated and approved for the bridge.

7.1 Impacts during the construction process

The construction activities of the approved bridge and erosion protection measures are repeated below and any additional changes to the environmental and socio-economic impacts caused by the proposed amendment of the layout, is highlighted below. The identified impacts are listed below and discussed thereafter:

The bio-physical issues identified include:

- Fauna and flora (destruction of habitat)
- Sedimentation and erosion
- Ground and surface water impact
- Sanitation and waste management

The socio-economic impacts identified include:

- “Sense of place” – visual impact
- Noise pollution
- Safety
- Employment opportunities (short-term) – positive

7.1.1. Impact on biodiversity

Description of the potential impact

The ecological integrity assessment undertaken in 2018 (as attached in Appendix C) indicated that the watercourse has been “Critically Modified” in accordance with the Habitat Integrity Assessment (HIA). The natural habitat and biota have been lost completely and infested by alien vegetation and subsequently, a critical and irreversible loss of ecosystem functioning has occurred. Therefore, the ecological importance and sensitivity of the watercourse is of very low significance.

The water quality is very poor due to discharge of hydrocarbons and toxicants from adjacent parking areas. Evidence of organic discharge was also found within the watercourse.

The stream has been artificially straightened, resulting in more rapid rate of flow through the reach and increased erosion potential. The stream also bends before it reaches the culvert underneath the railway line and this creates turbulence during peak flows, as the water meets the side of the channel and changes direction. This results in scouring and potential damage to infrastructure downstream.

The current ecological integrity of the location of the proposed pedestrian bridge remains the same as the area further downstream which have been included in the previous assessment undertaken. The proposed pedestrian bridge will affect the banks of the watercourse only as no culverts are proposed which could have affected the bed of the watercourse.

The following potential impacts have been identified (pre-mitigation significance indicated in brackets):

- Transformation and fragmentation of habitat for plants (Low)
- Transformation and fragmentation of habitat for animals (bird species) (Low)
- Increased soil erosion (Medium)

Impact Assessment

Due to the nature of the surrounding landscape transformation, the modification and removal of habitat and the existing disturbance regime adjacent to the stream, the aquatic system has no biodiversity value and is of low ecological importance and sensitivity. Constructing the pedestrian bridge at the proposed location will not change the ecological impacts assessed within the previous assessment and therefore the impact construction activities will have on the riparian habitat remains to be of low significance prior to mitigation.

TABLE 7: SIGNIFICANCE OF BIODIVERSITY IMPACT

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Significance	Probability	Confidence	Reversibility	Impact Rating	Impact Rating
Impact on biodiversity **[NEGATIVE]**	**Low**	**Definite**	**Sure**	**Reversible**	**Low**	**Very Low**

Mitigation measures

Important mitigation measures would include:

- The appointment of an ECO prior to construction;
- No dumping of building rubble must be allowed within the watercourse;
- Vegetation clearance must be kept to a minimum;
- An alien vegetation removal plan should be implemented.

If all proposed activities are kept within the designated areas and mitigation measures are implemented, then this potentially **low significance could be reduced to having no impact at all**.

7.1.2. Erosion and Sedimentation

Description of the potential impact

One of the potential impacts of construction within a watercourse is the sedimentation of downstream environments. This is due to the clearing of vegetation, which leads to the runoff from the site having a high sediment load. The construction of the pedestrian bridge further upstream from the approved area proposed for the bridge and erosion protection structures, could potentially add to the sedimentation and erosion caused by the construction activities.

Impact Assessment

Within the previous assessment, it was assessed that the clearing of vegetation and disturbance of soil will increase the risk of sedimentation and erosion and therefore the significance of this impact was given a medium rating without any mitigation measures implemented. Although the construction of the pedestrian bridge could add to the volume of sedimentation caused by the construction activities, the construction period is of a very short duration and will only impact the banks of the watercourse. The significance of the impact therefore remains to be of medium significance prior to the implementation of mitigation measures.

TABLE 8: SEDIMENTATION AND EROSION

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Significance	Probability	Confidence	Reversibility	Impact Rating	Impact Rating
Sedimentation and Erosion [NEGATIVE]	**Medium**	**Definite**	**Sure**	**Reversible**	**Medium**	**Low**

Mitigation measures

Construction activities must be scheduled to occur outside of the rainy period, thereby reducing the volume of runoff during construction. Sandbags must also be used during construction in areas prone to erosion.

7.1.3 Impact on surface water

Description of the potential impact

As construction will take place within the watercourse, the risk of pollutants finding their way into the channel and moving downstream towards the Crocodile River is high. Typical sources of pollution include oils and fuel from construction vehicles and construction materials such as cement, detergents, paints and other chemicals. The construction of the pedestrian bridge will not have any additional impact on surface water during the construction phase.

Impact Assessment

The significance of this impact has been rated as medium within the previous assessment undertaken, as pollutants can be washed downstream and end up in the Crocodile River. The proposed change in the layout will change the assessment of this impact on surface water and therefore the impact remains to be of medium significance prior to the implementation of mitigation measures.

TABLE 9: IMPACT ON SURFACE WATER

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Significance	Probability	Confidence	Reversibility	Impact Rating	Impact Rating
Surface water contamination [NEGATIVE]	High	Likely	Sure	Reversible	Medium	Low

Mitigation measures

Careful management and education of all construction staff, together with the implementation of an appropriate EMP at this site, would curtail the risk of pollution. Other mitigation measures will include the following:

- Chemical toilet facilities must be provided for construction staff and must be placed out of the 1:50 year flood line. These toilets must be cleaned regularly.
- All construction waste must be removed to a registered landfill site.

Specified mitigation measures have been included within the EMP attached as Appendix E.

7.1.4 Visual Impact

Description of the potential impact

Construction activities will take place adjacent to the parking area of BUCO Hardware store. The construction site will therefore be visible to all the BUCO Hardware customers; however, the proposed

site is surrounded by businesses with an industrial character and therefore the construction activities would not have a significant visual impact on the surrounding environment. The construction of the pedestrian bridge would not add to the visual impact during the construction phase, as construction activities will take place during the same period within which the approved bridge and erosion protection measures are being constructed.

Impact Assessment

The significance of the visual impact during construction can be regarded as low due to the impact being site specific, short duration and the area being industrial in nature. Therefore, the temporary construction site would be of low significance during the construction phase.

TABLE 10: VISUAL IMPACT

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Significance	Probability	Confidence	Reversibility	Impact Rating	Impact Rating
Visual Impact [NEGATIVE]	**Medium**	**Likely**	**Sure**	**Reversible**	**Low**	**Very Low**

Mitigation measures

- Ensure a clean site policy during the construction phase.
- Make use of a shade cloth where necessary to mitigate the negative visual impact of the construction site.

7.1.5 Noise disturbance

Description of the potential impact

Construction activities, construction vehicles and construction personnel on site would cause an increase in noise levels at the construction site, which may impact negatively on adjoining tenants, however, due to the industrial character of the surrounding area, clients and adjacent business owners will not expect a pristine quiet environment. The construction of the proposed pedestrian bridge will not add to the expected noise disturbance during the construction phase of the development.

Impact Assessment

The additional noise created by these construction activities would be insignificant as the surrounding area is already noisy due to vehicles and other surrounding businesses. Therefore, the noise impact during the construction phase is therefore of very low significance.

TABLE 10: NOISE IMPACT

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Significance	Probability	Confidence	Reversibility	Impact Rating	Impact Rating
Noise Impact [NEGATIVE]	**Low**	**Likely**	**Sure**	**Reversible**	**Low**	**Very Low**

Mitigation measures

Construction workers must keep the noise levels down during the construction phase to minimise the impact on business owners, and should any heavy machinery be used, it must be used at times that it does not cause noise that is a nuisance to the surrounding business owners.

7.1.6 Safety

Description of the potential impact

Construction activities could lead to injuries to staff or the public. These activities include:

- The construction of the proposed development –
  - Movement of construction vehicles to and from the site
  - Handling of equipment and material
- The operation of the proposed development –
  - Movement of private vehicles to and from the site

Impact Assessment

The significance of this potential impact is considered to remain very low with the additional construction of the pedestrian bridge, if the proposed mitigation measures are implemented.

TABLE 10: SAFETY

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Significance	Probability	Confidence	Reversibility	Impact Rating	Impact Rating
Safety [NEGATIVE]	**Low**	**Likely**	**Sure**	**Reversible**	**Low**	**Very Low**

Mitigation measures

- All necessary signage and traffic measures, such as speed limits, must be implemented for safe movement of vehicles to and from the proposed development
- The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) and the National Building Regulations.
- Ensure that the handling of equipment and materials is supervised and adequately instructed.
- Adequate facilities must be available on site for the emergency treatment of staff and members of the public.

7.1.7 Socio-economic Impact

Description of the potential impact

The construction of the bridge and pedestrian bridge will not have any impact on the social environment during construction, besides the creation of temporary job opportunities.

Impact Assessment

During the previous assessment it was found that there will be a positive social and economic impact during the construction phase, as temporary employment will be provided. The additional construction of the proposed pedestrian bridge will not change the significance of the impact.

TABLE 11: SOCIO-ECONOMIC IMPACT

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Significance	Probability	Confidence	Reversibility	Impact Rating	Impact Rating
Job opportunities [NEGATIVE]	**High**	**Definite**	**Sure**	**Reversible**	**Low**	**Medium (+)**

Mitigation measures

The applicant and/or project manager must ensure that local residents receive preference for job opportunities where local labour might be required.

It is imperative that all personnel adhere to the Occupational Health and Safety Act 85 of 1998 and that no personnel enter any other surrounding properties.

7.2 Operational Phase Impacts

During the previous assessment, the proposed and approved activities were likely to result in the following environmental and socio-economic impacts:

- Loss of biodiversity
- Flooding

The construction of the proposed pedestrian bridge further upstream from the approved area, will not have any additional operational impacts on the bio-physical environment as the proposed pedestrian bridge will only impact the already disturbed banks of the watercourse. The social impact of the pedestrian bridge during the operational phase, will however be positive.

7.2.1. Impact on biodiversity

Description of the potential impact

As indicated during the assessment of the construction phase, the ecological integrity assessment indicated that the watercourse has been Critically Modified as per the Habitat Integrity Assessment (HIA). The natural habitat and biota have been lost completely and infested by alien vegetation and subsequently, a critical and irreversible loss of ecosystem functioning has occurred. The ecological importance and sensitivity of the watercourse is therefore of very low significance. The proposed pedestrian bridge will not change the baseline ecological integrity of the proposed project area.

Impact Assessment

The construction of the approved bridge as well as the proposed pedestrian bridge is unlikely to influence the current ecological state of the adjacent and downstream river reaches. In accordance with the Riparian Specialist Report conducted, there is no evidence to suggest that the bridge will in any way be environmentally negative. The impact is therefore of low significance prior to the implementation of mitigation measures.

TABLE 12: IMPACT ON BIODIVERSITY

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Significance	Probability	Confidence	Reversibility	Impact Rating	Impact Rating
Biodiversity [NEGATIVE]	**Low**	**Definite**	**Sure**	**Irreversible**	**Low**	**Very Low**

Mitigation

Due to the ecological integrity of the watercourse being critically modified, it is suggested that measures be taken to improve the ecological state of the watercourse. An alien vegetation removal plan must be implemented to improve the ecological condition of that section of the watercourse.

With BUCO taking responsibility of the maintenance of the channel, the ecological condition of the watercourse can only improve.

7.2.2. Flooding

Description of the potential impact

The watercourse is fragmented by various culverts that cause ponding and flood attenuation, upstream and downstream of the proposed bridge. The construction of the approved bridge may cause further ponding and flood attenuation, and for this reason a Hydrological Assessment was conducted. This assessment involved flow simulations to determine the rise in flood levels caused by the construction of the bridge.

Impact Assessment

The previous assessment undertaken indicated that the culverts upstream and downstream of the proposed bridge serve as an artificial control for flow entering the reach. These culverts were designed to accommodate a 1:50 year flood. For this reason, the hydrological assessment was done based on a 1:50 year flood event. The culvert immediately upstream of the proposed bridge on the Old Pretoria Road has sufficient capacity to accommodate a 1:50 year flood. The proposed bridge could cause minimal flooding of 6mm during a 1:50 year flood event. This flooding can be tolerated, as the water would overtop the bridge for a limited time period, during which delivery trucks would not be able to make use of the exit bridge. As noted within the Hydrological Assessment, the proposed bridge is within the norm for the road culverts/crossings in the same catchment.
During a 1:100-year flood event, both the upstream culvert and proposed bridge will overtop up to an expected depth of 0.28m. Taking note of the topography of the area, the water will flow towards the eastern side of the proposed bridge (BUCO stockyard) during peak flood situations.

The proposed pedestrian bridge does not entail the construction of any culverts whereby the flow of water would be restricted and cause additional flooding.

The stockyard east of the proposed bridge is the only area running a risk of flooding during a 1:100-year flood event. Therefore, the impact is of medium significance and with the implementation of mitigation, this impact can be reduced to low significance.

TABLE 13: HYDROLOGY

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Significance	Probability	Confidence	Reversibility	Impact Rating	Impact Rating
Hydrology [NEGATIVE]	**Medium**	**Definite**	**Sure**	**Reversible**	**Medium**	**Low**

Mitigation measures

The applicant must ensure that the culvert underneath the proposed bridge is kept clean to prevent blockages that would increase the risk of flooding and damage to the pedestrian bridge.

7.2.3. Improved traffic and pedestrian flow

Description of the environment

Due to the limited space within the stockyard, the traffic flow of other delivery trucks is backed up as the truck in the stockyard must firstly make a U-turn and exit via the same single lane bridge before the other delivery trucks can enter the stockyard. With the construction of an additional exit to relieve this traffic congestion, delivery trucks will be able to do more deliveries in one day as trucks will no longer be wasting time waiting to offload BUCO stock. The construction of this access bridge was previously approved in May 2018.

BUCO recently acquired more office space adjacent and east of the watercourse where the bridge structure has been approved. To ease the flow of pedestrians between BUCO and the newly acquired office space, BUCO requested that a crossing be provided in-line with the entrance to BUCO and the new offices. Instead of the pedestrians making use of the approved bridge structure, pedestrians will be able to safely cross the watercourse without any safety hazard of delivery trucks making use of the same crossing.

Impact Assessment

Within the previous assessment it was determined that the construction of the bridge will result to no time being wasted by delivery trucks waiting to be offloaded which will enable delivery trucks to do more deliveries in one day. The bridge would also eliminate the danger associated with trucks making a U-turn within the stockyard to exit the BUCO Stockyard. As a result, the proposed bridge would have a positive social and economic impact.

The construction of the pedestrian bridge would also ensure that pedestrians move freely without any hazard between BUCO and the new offices acquired and therefore the socio-economic impact would be positive.

This positive impact is of high significance.

TABLE 14: SOCIO-ECONOMIC IMPACT

IMPACT	BEFORE MITIGATION					AFTER MITIGATION
	Significance	Probability	Confidence	Reversibility	Impact Rating	Impact Rating
Socio-economic **[POSITIVE]**	**High**	**Definite**	**Sure**	**Reversable**	**High (+)**	**High (+)**

The improved additional infrastructure will have a positive impact on the local community and employees of BUCO Hardware and therefore no mitigation measures would be required to further enhance this impact

7.3 Environmental Impact Statement

The table below summarises the impacts identified and assessed for the construction activities proposed for the project:

TABLE 15: ENVIRONMENTAL IMPACT STATEMENT

IMPACT	SIGNIFICANCE BEFORE MITIGATION MEASURES	SIGNIFICANCE AFTER MITIGATION MEASURES
Construction Phase Impacts		
Biodiversity Impact	Low	Very Low
Sedimentation and Erosion	Medium	Low
Impact on surface water	Medium	Low
Visual Impact	Low	Very Low
Noise Impact	Low	Very Low
Safety Impact	Low	Very Low
Socio-Economic Impact	Low	Medium (+)
Operational Phase Impacts		
Biodiversity Impact	Low	Very Low
Hydrology	Medium	Low
Socio-economic Impact	High (+)	High (+)

6. CONCLUSION AND WAY FORWARD

8.1 Assumptions and Limitations

In undertaking this investigation and compiling the Draft Basic Assessment Report, the following has been assumed:

- The information provided by the proponent is accurate and unbiased, and no information that could change the outcome of the Environmental Authorisation Amendment process has been withheld.
- The scope of this investigation is limited to assessing the additional environmental impacts associated with the construction of the pedestrian bridge.
- The conclusion and recommendations proposed are based solely on the information, scope of works as agreed with the proponent.

8.2 Conclusion

The essence of all environmental assessment processes is aimed at ensuring informed decision-making and environmental accountability. Furthermore, it assists in achieving environmentally sound and sustainable development. The impact assessment for this project has been undertaken in line with the requirements prescribed in the NEMA regulations.

The assessment of the possible impacts associated with the construction and operational activities of the pedestrian bridge outside the previously assessed and approved area, concluded that the impact on the surrounding environment is of **low significance** as the current condition of the watercourse has been critically modified and the construction of the pedestrian bridge further upstream will not have any additional impact on the biophysical environment. Recommendations have however been made to address the impacts which could affect the biophysical and socio-economic environment. Recommendations for the mitigation of impacts are included within Section 6 and also the Draft Environmental Management Plan attached.

The significance of the potential environmental (biophysical and social) impacts associated with the proposed project are discussed in detail under **Section 6**.

It is the opinion of the EAP that the amendment of the existing and approved EA be granted, and the proposed mitigation included as the conditions of the authorisation.

8.2 Way Forward

The next steps for the EA Amendment process will be to distribute the Draft EA Amendment Report and make it available to the public (including the registered I&APs) and Organs of State for a period of 30 days, during which the Competent Authority (DARDLEA) will also be given the opportunity to provide comments on the report. After the 30-day comment period, all comments will be addressed by the EAP and incorporated within the Final EA Amendment Report to be submitted to the

DARDLEA for decision making. All registered I&APs will be notified of the decision and will be given an opportunity to appeal as per the NEMA requirements.

7. REFERENCES

National Environmental Management Act 107 of 1998 (NEMA 107, 1998)

General Notice Regulation 982, 983, 984 and 985 of 2014 (as amended in 2017)

Mpumalanga Biodiversity Conservation Plan, 2014

Mucina, L. and Rutherford, M.C. (eds.) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African Biodiversity Institute, Pretoria.

CRH Clanahan, 2017. Report on Hydrology and Flood Levels for the proposed bridge at BUCO Yard, City of Mbombela

Aurecon RSA, Doug McCulloch, 2017. Riparian Assessment and Watercourse Stabilisation Report for BUCO Nelspruit, Mpumalanga Province.