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**BASIC ASSESSMENT REPORT FOR:**

**THE PROPOSED CONSTRUCTION OF A NEW CONCRETE BRIDGE OVER MOOIRIVIER, A FUNCTIONAL STORMWATER OVERFLOW FOR RETENTION DAM, WASTEWATER TREATMENT WORKS TO COMPLIMENT IRRIGATION, ROUTE NWU SEWER USAGE VOLUME TO TREATMENT PLANT AND UPGRADE THE EXISTING STORMWATER CANAL ON PORTION 24 AND PORTION 412 OF THE FARM POTCHEFSTROOM TOWN AND TOWNLANDS 435 AND PORTION 1 OF ERF 1302, REGISTRATION DIVISION: IQ; NORTH WEST PROVINCE.**



<b>NAME OF APPLICANT</b>	<b>North West University</b>
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<b>PHYSICAL ADDRESS:</b>	11 Hoffman Street, Potchefstroom 2520

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DRAFT

## **PROJECT INFORMATION**

**Project Name:** Application for an Environmental Authorisation the proposed construction of a new concrete bridge over Mooirivier, a functional overflow for the retention dam, wastewater treatment plant, route the NWU sewer usage volume to treatment plant, upgrade the existing stormwater canal (concrete culvert) and subsequently demolish the existing damaged bridge on Portion 24 & Portion 412 of Farm Potchefstroom Town and Townlands 435 and Portion 1 of Erf 1302, Registration Division: IQ; North West Province.

**Report Title:** Basic Assessment Report

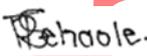
**Prepared By:** Milnex Management Services (Pty) Ltd

**Date:** July 2023

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### **QUALITY CONTROL:**

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	<b>Report Author:</b>	<b>Report Reviewer:</b>
<b>Name:</b>	Ms. Percy Schaole Reg. EAP (EAPASA) Pr. Sci. Nat.	N/A
<b>Signature:</b>		

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**The DEA screening tool was used in compiling this document**

**APPLICANT DETAILS**

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## **ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

- (1) The environmental impact assessment process must be undertaken in line with the approved plan of study for environmental impact assessment.
- (2) The environmental impacts, mitigation and closure outcomes as well as the residual risks of the proposed activity must be set out in the environmental impact assessment report.

### **OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

2. The objective of the environmental impact assessment process is to, through a consultative process-
- (a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
  - (b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
  - (c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
  - (d) determine the--
    - (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
    - (ii) degree to which these impacts-
      - (aa) can be reversed;
      - (bb) may cause irreplaceable loss of resources, and
      - (cc) can be avoided, managed or mitigated;
  - (e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
  - (f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
  - (g) identify suitable measures to avoid, manage or mitigate identified impacts; and
  - (h) identify residual risks that need to be managed and monitored.

**SCOPE OF ASSESSMENT AND CONTENT OF ENVIRONMENTAL IMPACT  
ASSESSMENT REPORTS**

3. Contact Person and correspondence address

A. DETAILS OF:

- i) The EAP who prepared the report**
- ii) Expertise of the EAP**

<b>NAME OF PRACTITIONER</b>	<b>QUALIFICATIONS</b>	<b>CONTACT DETAILS</b>
Ms. Percy Schaole Reg. EAP (EAPASA) Pr. Sci. Nat.	<ul style="list-style-type: none"> <li>• Master’s Degree in Environmental Management</li> <li>• Master’s Degree in Environmental Science</li> <li>• Honours in B.Sc. Environmental Science</li> <li>• B.Sc. Environmental Science (refer to <b>Appendix 2</b>)</li> </ul>	Tel No.: (018) 011 1925 Fax No. : (053) 963 2009 e-mail address: <a href="mailto:percy@milnex-sa.co.za">percy@milnex-sa.co.za</a>
Mr. Andile Grant Nxumalo Reg. EAP (EAPASA)	Hons. Degree in Environmental Science  (refer to <b>Appendix 1</b> )	Tel No.: (018) 011 1925 Fax No.: (053) 963 2009 e-mail address: <a href="mailto:andile.grant@milnex-sa.co.za">andile.grant@milnex-sa.co.za</a>

**Summary of the EAP’s past experience.** (Attach the EAP’s curriculum vitae as **Appendix 3**)

Milnex Management Services (Pty) Ltd was contracted by **North West University** as the independent environmental consultant to undertake the Basic Assessment Process for the proposed Construction of concrete bridge over Mooirivier, a functional overflow for retention dam, wastewater treatment plant to compliment irrigation, route NWU sewer usage volume to treatment plant, upgrade the existing stormwater canal (concrete culvert) and subsequently decommission the existing damaged bridge on Portion 24 and Portion 412 of the Farm Potchefstroom Town and Townlands 435 and Portion 1 of Erf 1302, Registration Division: IQ; North West Province.

The activities will take place at the North West University Potchefstroom Campus at Fanie du Toit Sports grounds

Milnex Management Services (Pty) Ltd does not have any interest in secondary developments that may arise out of the authorisation of the proposed project.

Milnex Management Services (Pty) Ltd is a specialist environmental consultancy with extensive experience in the mining industry which provides a holistic environmental management service, including environmental assessment and planning to ensure compliance with relevant environmental legislation. Milnex Management Services (Pty) Ltd benefits from the pooled resources, diverse skills and experience in the environmental and mining field held by its team that has been actively involved in undertaking environmental studies for a wide variety throughout South Africa.

Ms. Percy Schaole have experience consulting in the environmental field. Her key focus is on environmental assessment, advice and management and ensuring compliance to legislation and guidelines. She is currently involved in undertaking EIAs for several projects across the country (refer to **Appendix 1** for CV)

## B. THE LOCATION OF THE ACTIVITY

<b>Farm Name:</b>	<ol style="list-style-type: none"> <li>1. Portion 24 of the Farm Potchefstroom Town and Townlands 435</li> <li>2. Portion 412 of the Farm Potchefstroom Town and Townlands 435</li> <li>3. Portion 1 of Erf 1302</li> </ol>
<b>Application area footprint (Ha)</b>	Approximately 15 ha
<b>Magisterial district:</b>	Dr Kenneth Kaunda District Municipality
<b>Distance and direction from nearest town</b>	The property is located at the North West University Potchefstroom Campus at Fanie du Toit Sports grounds Loop street, Potchefstroom in the North West Province.
<b>21 digit Surveyor General Code for each farm portion</b>	<ol style="list-style-type: none"> <li>1. TOIQ00000000046500024</li> <li>2. TOIQ00000000046500412</li> <li>3. TOIQ03050000130200001</li> </ol>
<b>Application to include</b>	<p>The following is anticipated to be undertaken:</p> <ul style="list-style-type: none"> <li>• Stormwater improvements along the open channel parallel to the extended road section of Loop Street within the property of the NWU</li> <li>• Construct a new bridge to replace the existing damaged bridge to the east of the site area, and</li> <li>• Demolish/remove the damaged bridge together with reinstatement of the bridge site</li> <li>• Construct a wastewater treatment works (WWTW) for reclaimed effluent to be used for irrigation throughout the sports complex, including pump station for the reclaimed water, and the reticulation piping</li> <li>• Lining the existing irrigation storage dam for improved water security</li> <li>• Minor roadworks associated with the new and replacement infrastructure</li> </ul>

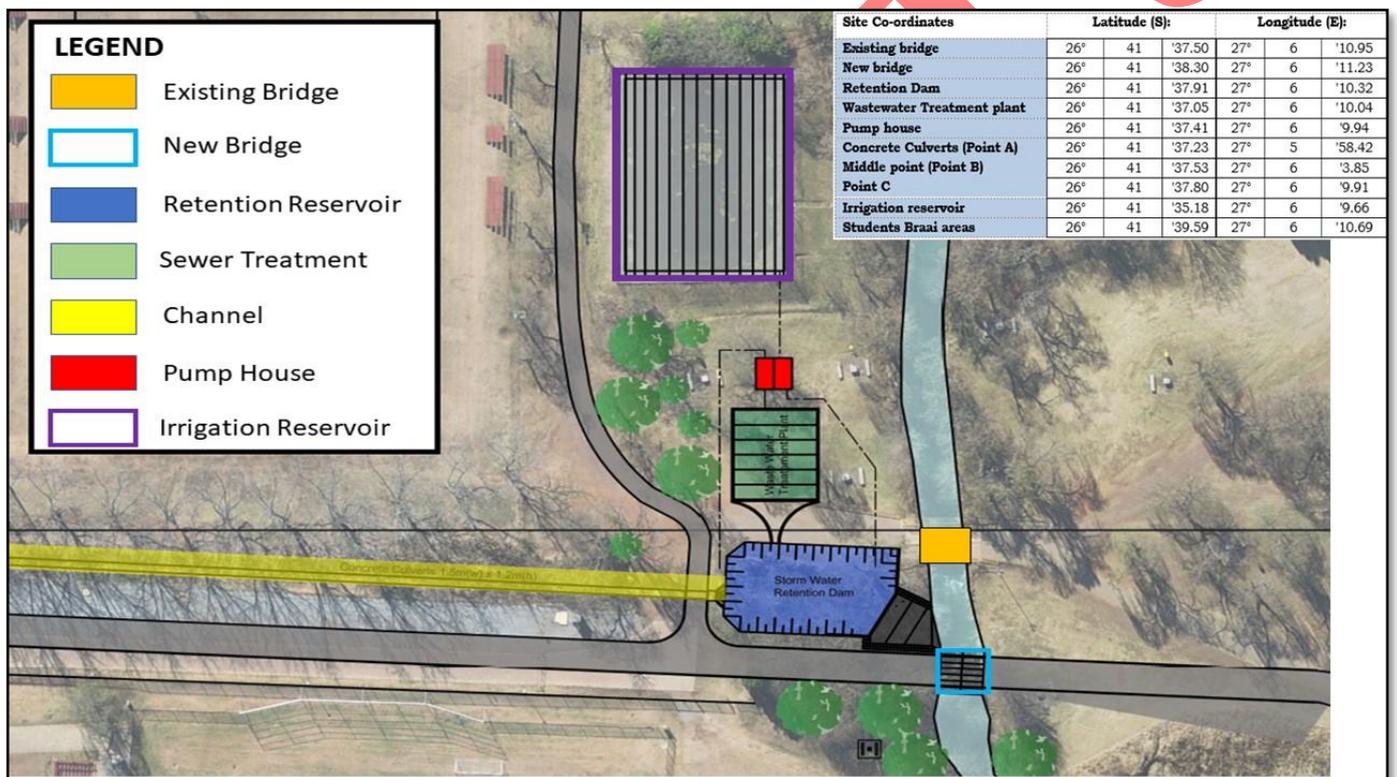
## C. PLAN WHICH LOCATES THE PROPOSED ACTIVITY/ACTIVITIES APPLIED FOR AS WELL AS ASSOCIATED STRUCTURES & INFRASTRUCTURE AT AN APPROPRIATE SCALE

Milnex: TEN\_021 – The proposed construction of a concrete bridge over Moorivier, with associated activities and supporting infrastructure and subsequent Environmental Impact Assessment and Water Use Licence.

**Application area footprint extent is approximately 2 ha**

Below are middle coordinates of anticipated area to be cleared were taken as depicted by Figure 1 below.

Site Co-ordinates	Latitude (S):			Longitude (E):		
Existing bridge	26°	41	'37.50	27°	6	'10.95
New bridge	26°	41	'38.30	27°	6	'11.23
Retention Dam	26°	41	'37.91	27°	6	'10.32
Wastewater Treatment plant	26°	41	'37.05	27°	6	'10.04
Pump house	26°	41	'37.41	27°	6	'9.94
Concrete Culverts (Point A)	26°	41	'37.23	27°	5	'58.42
Middle point (Point B)	26°	41	'37.53	27°	6	'3.85
Point C	26°	41	'37.80	27°	6	'9.91
Irrigation reservoir	26°	41	'35.18	27°	6	'9.66
Students Braai areas	26°	41	'39.59	27°	6	'10.69



**Figure 1: Co-ordinate area**

**Locality Map**

(show nearest town, scale not smaller than 1:250000 attached as **Appendix 3**).

A Locality map is attached in **Appendix 3** and on Figure 2 below.



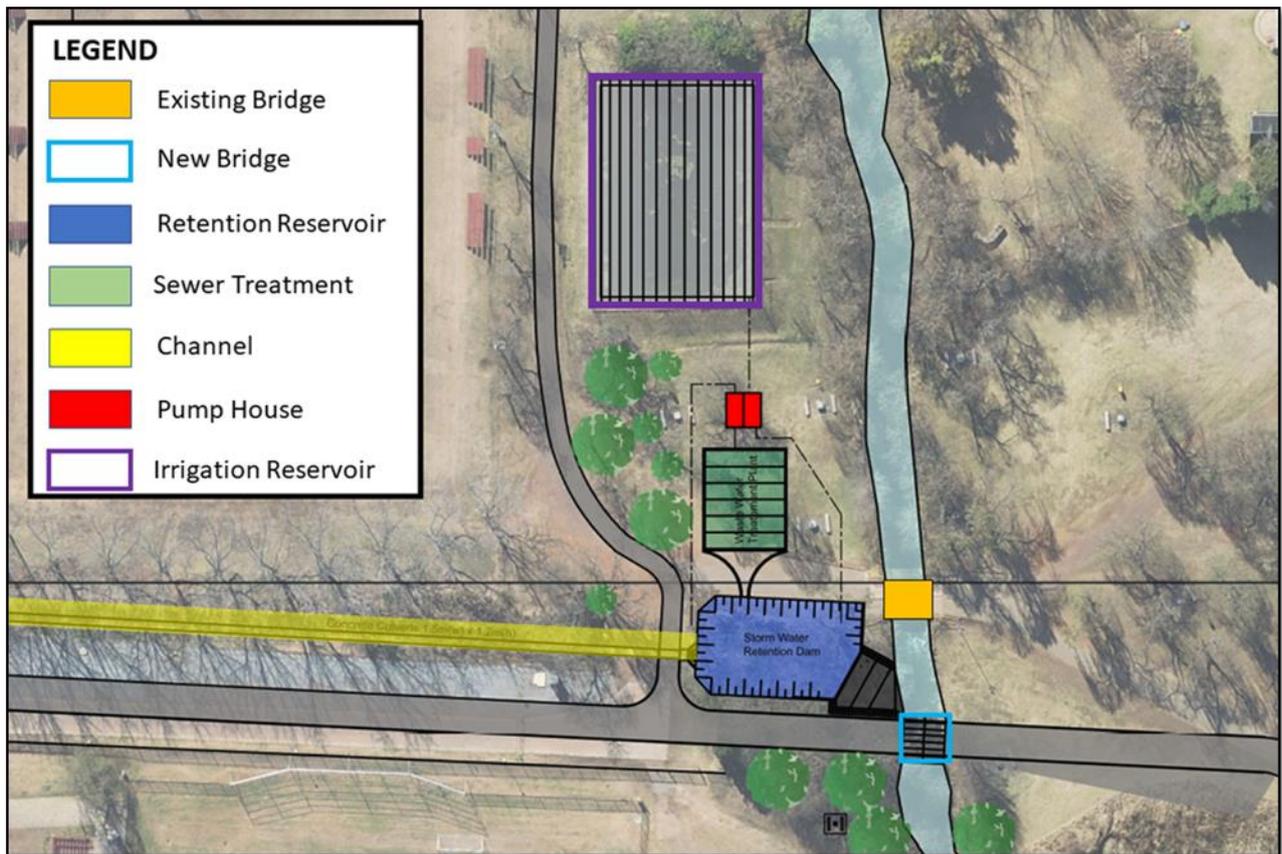


Figure 4: Site Plan Map

D. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY.

i. Listed & Specified Activities

INDICATE THE NUMBER AND DATE OF THE RELEVANT NOTICE:	ACTIVITY NO (S) AND ACTIVITY DESCRIPTION (IN TERMS OF THE RELEVANT NOTICE)	DESCRIBE EACH LISTED ACTIVITY AS PER PROJECT DESCRIPTION
<b>LISTING NOTICE 1</b>		
GNR 983  Listing Notice 1  GN 517 of June 2021	<p><b>Activity 12 (i)(ii)(a)(b)</b></p> <p><i>The development of —</i></p> <p><i>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area,</i></p> <p><i>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</i></p> <p><i>where such development occurs—</i></p> <p><i>(a) within a watercourse</i></p>	<p>The applicant is anticipating constructing a Bridge over Mooirivier for both motorists and pedestrian at the Fanie du Toit sports grounds.</p> <p>The Retention dam will be developed within the watercourse.</p> <p>The pump house, wastewater treatment works, irrigation reservoir will take place within 32 metres of a watercourse</p>

	<i>(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;</i>	
GNR 983 Listing Notice 1 GN 517 of June 2021	<b>Activity 19</b> <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 a watercourse;</i>	The proposed development requires the construction of bridges and bulk infrastructure across tributaries/ watercourses occurring on site which will require the excavation of more than 10m <sup>3</sup> of material from a watercourse, thus this listed activity is triggered and applied for.
GNR 983 Listing Notice 1 GN 517 of June 2021	<b>Activity 25</b> <i>The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres.</i>	The applicant anticipates to construct wastewater treatment plant to treat wastewater, grey water and stormwater arising on the site for the purpose of irrigation.
GNR 983 Listing Notice 1 GN 517 of June 2021	<b>Activity 27</b> <i>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation</i>	Clearance of trees found on the application area along side the river and vegetation in the vicinity of the application area.  <b>Note:</b> This is not inclusive of vegetation to be cleared for the stormwater canal and this is classified as a linear activity
<b>LISTING NOTICE 3</b>		
GNR 985 Listing Notice 3 GN 517 of June 2021	<b>Activity 14 (ii)(a)(h)(iv)</b> <i>The development of-</i> <i>(ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs-</i>  <i>(a) within a watercourse;</i>  <b>(h) North West</b> <i>(iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;</i>	The proposed activities will be constructed within areas identified as Critical biodiversity areas.  Parts of the application area falls within Critical biodiversity areas one (CBA1)
GNR 985	<b>Activity 12 (h)(iv)</b>	Clearance of trees found on the application area alongside the river

<p>Listing Notice 3 GN 517 of June 2021</p>	<p><i>The clearance of an area of 300 square metres or more of indigenous vegetation</i></p> <p><b>(h) North West</b></p> <p><i>(iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority</i></p>	<p>and vegetation in the vicinity of the application area.</p> <p>The proposed activities will be constructed within areas identified as Critical biodiversity areas.</p> <p>Parts of the application area falls within Critical biodiversity areas one (CBA1)</p>
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c) Property description/physical address

<p><b>Alternative Site 1 (only site alternative)</b></p>	<ul style="list-style-type: none"> <li>• Portion 24 of the Farm Potchefstroom Town and Townlands 435</li> <li>• Portion 412 of the Farm Potchefstroom Town and Townlands 435</li> <li>• Portion 1 of Erf 1302</li> </ul> <p>Registration Division: IQ; North West Province.</p>
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ii. Description of the associated structures & infrastructure related to the development

(Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity)

The applicant (**North West University**) intend to construct concrete bridge over Mooirivier, a functional overflow for retention dam, wastewater treatment works, route NWU sewer usage volume to treatment plant, upgrade the existing stormwater canal and subsequently demolish the existing damaged bridge on Portion 24 and Portion 412 of the Farm Potchefstroom Town and Townlands 435 and Portion 1 of Erf 1302, Registration Division: IQ; North West Province.

The activities will take place at the North West University Potchefstroom Campus at Fanie du Toit Sports grounds Loop street. Loop Street is a 6 meter wide municipal link road within a 20 meter wide road reserve.

The area has an existing old bridge which was damaged by floods experienced in Potchefstroom in 2022. Currently the bridge is not in use, therefore, the applicant would like to align new bridge with Loop Street Road and centre line.

The following is anticipated to be undertaken:

- Stormwater improvements along the open channel parallel to the extended road section of Loop Street within the property of the NWU
- Construct a new bridge to replace the existing damaged bridge to the east of the site area, and
- Demolish/remove the damaged bridge together with reinstatement of the bridge site

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- Construct a wastewater treatment works (WWTW) for reclaimed effluent to be used for irrigation throughout the sports complex, including pump station for the reclaimed water, and the reticulation piping
- Lining the existing irrigation storage dam for improved water security
- Minor roadworks associated with the new and replacement infrastructure

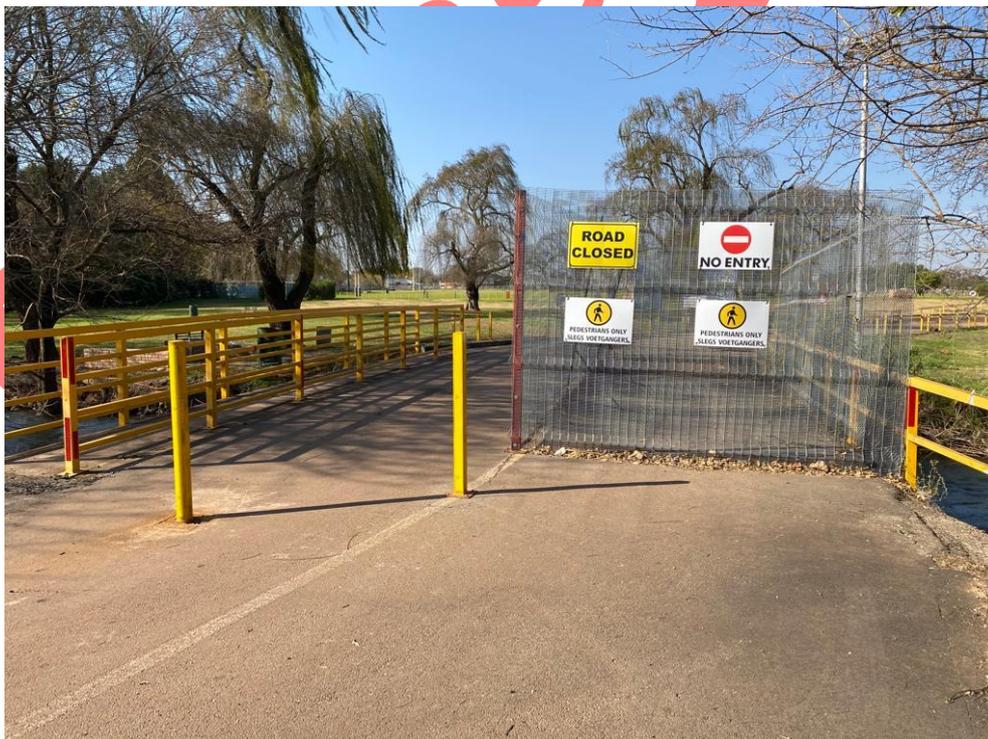
### MINOR ROAD WORKS

The internal roads will need to be upgraded during the construction phase. The internal roads will have mountable kerbs with brick-paved or asphalt surfaces suitable for heavy vehicles. Earthworks (cut and fill) will be performed to shape the roads, to provide suitable drainage.

### EXISTING BRIDGE

Since the bridge is damaged, it is not safe for use on one lane thus it will be decommissioned. The intention would be to use the existing bridge for a limited period of time, until the new bridge is ready for commissioning. The existing bridge will have a temporary open lane which will allow for vehicular and pedestrian access during the construction period, then will later be decommissioned.

The existing bridge is depicted on the Figures below:



**Figure 5:** The existing damaged bridge



**Figure 6:** Damage on the bridge and the area barricaded.

### **NEW CONCRETE BRIDGE DESIGN:**

The applicant anticipates to construct a bridge over the Mooirivier. The bridge will be used by motorists and will have sufficient pedestrian areas. According to the Engineering Service report, the new Mooi River bridge will be positioned to the South of the existing bridge crossing the Mooi River, at the North-West University campus. The bridge will be designed to the SANRAL Bridge Design Code, TMH7: Code of practice for the Design of Highway Bridges and Culverts in South Africa, Part 1 (1981), Part 2 (Rev 1988) and Part 3 (1989), CSRA.

The structures will be designed in a manner that it does not act as dams/ attenuation structures where water are “kept back”. The principle will be to allow the water to flow freely underneath the bridges. In terms of the type of bridge to be constructed, the safety of the NWU community (both pedestrians and road users) is a key consideration and therefore the structure will need to be useable and be able to withstand typical wet weather events.

The bridge will have a span of approximately 20m and will have the following:

- The new bridge will be higher than the existing bridge by approx. 2-3m.
- will have a longer span than the existing bridge (which is only 12.8m in span).
- will be built from more robust construction materials and design.

The bridge will have stainless steel vehicle impact barriers to prevent pedestrians and vehicles from falling off the bridge.

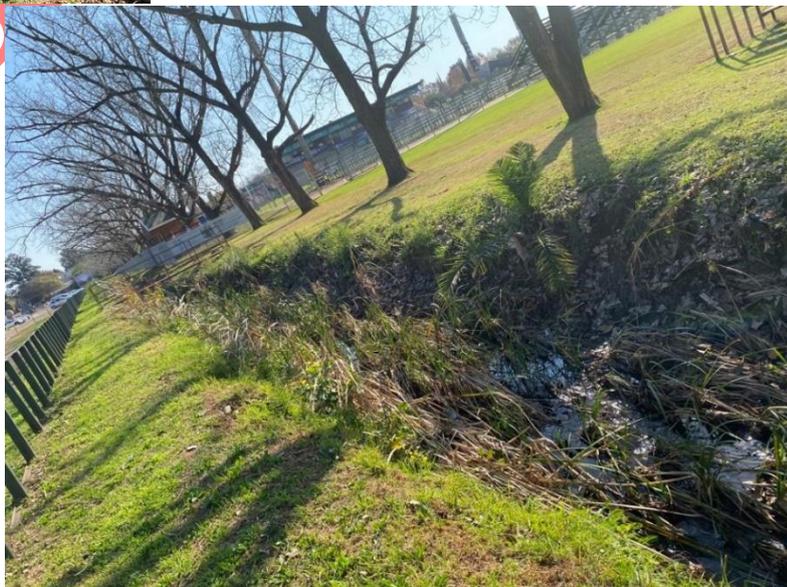
### **STORMWATER**

The existing stormwater canal is an open channel which is not maintained and has become a health & safety hazard. The upgrade will assist with reducing and/or preventing siltation,

Milnex: TEN\_021 – The proposed construction of a concrete bridge over Mooirivier, with associated activities and supporting infrastructure and subsequent Environmental Impact Assessment and Water Use Licence. erosion, and water pollution. If erosion, siltation and water pollution is not addressed, the long-term sustainability of the Mooirivier may be compromised. Stormwater management will promote infiltration and slow the release of runoff into wetlands and watercourses.

According to the Engineering Service report, there are two components to the stormwater design for the development:

- the first is the overall aspect of routing stormwater runoff from the new built portions safely, and
- the second being the replacement of the open channel to the north of Loop Street with an underground pipe culvert system, for a length of approximately 290 metres with the formal inlets at 50-metre intervals.



**Figure 7:** Status of the existing stormwater canal

### **RETENTION DAM CONSTRUCTION**

According to the Engineering Service report, the combined overland and underground pipe system will release the stormwater into the new retention pond and ultimately into the Mooi

Milnex: TEN\_021 – The proposed construction of a concrete bridge over Moirivier, with associated activities and supporting infrastructure and subsequent Environmental Impact Assessment and Water Use Licence. River. The underground pipe system which will collect water via a system of catchpits, manholes and pipes to accommodate the runoff of a 1 in 5-year storm event. A provisional sizing for the pipe culvert is to use either 2100mm (wide) x 1200mm (deep), or 2100 x 900 units, to provide a flow capacity of minimum 2.1 m<sup>3</sup>/s. The overland system consists of suitably shaped roads and paths to accommodate surface runoff.

The site layout and topography allow for the provision of retention facilities that would offset the effect of the increased runoff coefficient of the proposed development.

## **WATER INFRASTRUCTURES**

The development has three key components for water infrastructure:

- A potable reticulation to serve the buildings within the new wastewater treatment works, including a fire hydrant.
- Connections to the irrigation network, distributing the harvested rainwater and recovered treated wastewater effluent.
- The pump station.

## **WASTEWATER TREATMENT WORKS**

The objective of the wastewater treatment works (WWTW) is to treat wastewater and stormwater arising on the site to such a quality that it is suitable for reuse on the site (irrigation of the NWU Rugby fields). The projected volume of the reclaimed effluent and harvested rainwater is 500 kl/day to serve the Fanie Du Toit Sports Complex, and this is the basis of sizing the Wastewater Treatment Works and the irrigation pump station.

A bulk water meter will be installed serving the WWTW. The wastewater will then be pumped through the pump house/station into the irrigation reservoir for later use.

According to the Engineering Service report, portion of the municipal sewage is abstracted from the total flow, and treated close to the intended point of use. The abstraction will be via means of a new sump and small sewage pump station on the existing 400 diameter sewer pipe running to the south of Loop Street. There will be a short length (40m) of rising main (pressure pipe) that will feed the WWTW.

The WWTW will be an activated sludge using biological nutrient removal (BNR), as this offers the best means of nitrogen and phosphorus control. In addition, it is recommended that the Membrane Bioreactor (MBR) activated sludge system be adopted, as this provides an effluent that is solids-free and odour-free and will save space considerably due to the smaller tankage in comparison to the conventional activated sludge system. The MBR will be served by a 60 kVA standby generator to ensure that the operation is not interrupted by power outages.

## **EXISTING IRRIGATION RESERVOIR**

After wastewater has been treated, it will be stored within an existing reservoir in the bunded area. The water will need to be of a specific quality in line with Water Quality Guidelines (WQG) for Irrigation purposes.

Milnex: TEN\_021 – The proposed construction of a concrete bridge over Mooirivier, with associated activities and supporting infrastructure and subsequent Environmental Impact Assessment and Water Use Licence. The existing open-topped reservoir is used for storage of irrigation water. The reservoir is approximately 38 x 26m in plan and is concrete-lined. However, there are several leaks in the concrete, and the open surface is susceptible to algae growth seasonally (due to sunlight, and the presence of nutrients nitrogen and phosphorus in the stored water) and ingress of wind-blown material, such as leaves and twigs from the neighbouring trees. A roof will also improve safety in terms of reducing animal or person access.

This water will be irrigated onto the NWU Rugby fields and trees on site. Figures below depicts the existing irrigation reservoir.



**Figure 8:** Existing irrigation reservoir.

### EXISTING BRAAI AREA RELOCATION

The application area has existing braai areas for students to use for recreational activities. These braai areas will also need to be relocated to a different location which will be South West of river. The current braai area will be used as a training surface (New green Area).

The existing braai area is depicted by Figure below.



**Figure 9:** The existing braai area

## WATER USE LICENSE APPLICATION

North West University would have to obtain water use licences for construction related activities from the Department of Water and Sanitation (DWS) as required in terms of the NWA.

A pre- application process for water use license has been initiated with the Department of Water affairs and Sanitation (DWS).

The development triggers listed activities in terms of the Environmental Impact Assessment (EIA) Amended Regulations, Government Regulations (GNR) 517 of June 2021 promulgate under the National Environmental Management Act (NEMA) (Act no 107 of 1998).

### E. POLICY AND LEGISLATIVE CONTEXT

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	National & Provincial	27 November 1998
National Environmental Management Act No. 107 of 1998 as amended.	Department of Environmental Affairs	27 November 1998
Constitution of South Africa Act 108 of 1996	National	18 December 1996
National Environmental Management: Biodiversity Act No. 10 of 2004	Department of Environmental Affairs	7 June 2004
EIA regulations under NEMA	Department of Environmental Affairs	14 December 2014

Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	Department of Agriculture Forestry and Fisheries	1 June 1984
National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004).	National and Provincial	11 September 2004
National Water Act, 1998 (Act No. 36 of 1998).	National	20 August 1998
Dr Kenneth Kaunda District Municipality Integrated Development Plan (IDP)	Provincial	
JB Marks Council Municipality Integrated Development Plan (IDP) Review	Provincial	
Occupational Health and Safety Act (No 85 of 1993)	National	July 1993
National Heritage Resources Act (Act No. 25 of 1999)	National	April 1999
National Building Regulations and Building Standards Act (Act No. 103 of 1977)	National	July 1977
Municipal by-laws and guidelines		
National Environmental Management: Air Quality Act (Act No 39 of 2004)	National	February 2005

Description of compliance with the relevant legislation, policy or guideline:

Legislation, policy of guideline	Description of compliance
National Environmental Management Act No. 107 of 1998 as amended.	<p>In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised.</p> <p>In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.</p>
Constitution of South Africa Act 108 of 1996	<p>The development has to comply with environmental right in the Bill of Rights in the Constitution of the Republic of South Africa (Act 108 of 1996), which reads as follows (Chapter 2, section 24): “Everyone has the right a) to an environment that is not harmful to their health or well-being; and b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:</p> <p>i) prevent pollution and ecological degradation;                      ii) promote conservation; and                      iii) secure sustainable development and use of natural resources while promoting justifiable economic and social development.”</p>
National Environmental Management Waste Act, 2008 (Act No. 59 of 2008)	<p>The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment.</p>

	<p>The Minister may amend the list by –</p> <ul style="list-style-type: none"> <li>• Adding other waste management activities to the list.</li> <li>• Removing waste management activities from the list.</li> <li>• Making other changes to the particulars on the list.</li> </ul> <p>In terms of the Regulations published in terms of this Act (GN 921), A Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities (Category A and B) while Category C Activities (such as storage of waste) must be undertaken in accordance with the necessary norms and standards.</p> <p>Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that:</p> <ul style="list-style-type: none"> <li>• The containers in which any waste is stored, are intact and not corroded or in</li> <li>• any other way rendered unfit for the safe storage of waste.</li> <li>• Adequate measures are taken to prevent accidental spillage or leaking.</li> <li>• The waste cannot be blown away.</li> <li>• Nuisances such as odour, visual impacts and breeding of vectors do not arise; and</li> <li>• Pollution of the environment and harm to health are prevented.</li> </ul>
<p>Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)</p>	<p>For the management of alien species that will and might grow on site and ways to manage them</p>
<p>National Water Act, 1998 (Act No. 36 of 1998).</p>	<p>The objectives of the National Water Act, 1998 (Act No. 36 of 1998) have been addressed in the Water Use License Application. Mitigation and management measures have been compiled in this Basic Assessment Report for the protection of natural water resources.</p>
<p>National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004).</p>	<p>In terms of S57, the Minister of Environmental Affairs has published a list of critically endangered, endangered, vulnerable, and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007.</p> <p>In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA Phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of the EIA Phase.</p>

	<p>The Act provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (GG 34809, GN 1002), 9 December 2011). GNR 598: The Alien and Invasive Species (AIS) Regulations provides for the declaration of weeds and invader plants.</p>
<p>National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004).</p>	<p>No listed activities are triggered in terms of GNR. 893 printed in terms of the National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004). The Environmental Management Plan, however still focuses on the minimisation of any emissions resulting in deterioration of the air quality.</p>
<p>National Heritage Resources Act (Act No. 25 of 1999)</p>	<p>In terms of section 38 of the NHRA (subject to the provisions of subsections (7), (8) and (9) of the Act), any person who intends to undertake a development categorised as:</p> <ul style="list-style-type: none"> <li>• The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;</li> <li>• The construction of a bridge or similar structure exceeding 50 m in length;</li> <li>• Any development or other activity which will change the character of a site:             <ul style="list-style-type: none"> <li>• Exceeding 5,000 m<sup>2</sup> in extent;</li> <li>• Involving three or more existing erven or subdivisions thereof; or</li> </ul> </li> <li>• Involving three or more erven or divisions thereof which have been consolidated within the past five years; or</li> <li>• The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;</li> <li>• The re-zoning of a site exceeding 10,000 m<sup>2</sup> in extent; or</li> <li>• Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.</li> </ul>
<p>Occupational Health and Safety Act (No 85 of 1993)</p>	<p>The Occupational Health and Safety Act (OHSA) provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work,</p>

	<p>against hazards to health and safety arising out of or in connection with the activities of persons at work.</p>
<p>Sustainable Development</p>	<p>The principle of Sustainable Development has been established in Section 24 of the Constitution of the Republic of South Africa (No. 108 of 1996) and given effect by NEMA. Section 1(29) of NEMA states that sustainable development means the integration of social, economic and environmental factors into the planning, implementation and decision-making process so as to ensure that development serves present and future generations.</p>
<p>National Building Regulations and Building Standards Act (Act No. 103 of 1997)</p>	<p>The Act has the following objective:          “To promote for the promotion of uniformity in the law relating to the erection of buildings in the areas of jurisdiction of local authorities for the prescribing of building standards and for the matters connected therewith.”          All building controls, as considered in terms of the final roll-out of the parallel town planning process, will need to comply with this Act.</p>
<p>North West Provincial Spatial Development Framework</p>	<p>The North West Provincial Rebranding, Repositioning and Renewal (RRR) Strategy, aims to support the successful implementation of the National Development Plan (NDP). The RRR contributes expressly to the NDP objectives and therefore strive to bring about the desired socio-economic transformation to the people within the province. The North West Spatial Development Framework needs to be conducive for sustainable development and will provide for the execution of the following objectives:          “          “3. Giving spatial effect to objectives set by National Government Policies on Sustainability to support the optimal integration of the aspects of social, economic, institutional, political, physical and engineering services”</p>
<p>National Environmental Management: Air Quality Act (No. 39 of 2004)</p>	<p>The aforementioned act provides for the control of dust, noise and offensive odours. In addition the Environmental Conservation Act (73 of 1989) includes a Regulation pertaining to noise management. There are several Regulations (By-laws), or Acts that are applicable to the proposed development, in terms of both health and noise management. National Standards (SANS 10103:2003) specifies the maximum ambient noise level acceptable in various land use type zones.</p> <p>S18, S19, and S20 of the Act allow certain areas to be declared and managed as “priority areas.”</p> <p>Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards.</p> <p>GN R 827 – National Dust Control Regulations prescribes general measures for the control of dust in all areas</p>

Draft

## F. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

### **THE DESIRABILITY FOR THE PROJECT ON THE PROPOSED PROJECT SITE**

The applicant is proposing to construct concrete bridge over Mooirivier, a functional overflow for retention dam, wastewater treatment works, route NWU sewer usage volume to treatment plant, upgrade the existing stormwater canal and subsequently demolish the existing damaged bridge located at the North West University, Potchestroom in the North West Province.

The project was necessitated after the mooirivier flooding in 2022 which damaged the existing bridge, thus the need to construct the new brisge and associated infrastructure. The stormwater canal has also presented some health & safety issues

### **HOW THE PRINCIPLES OF ENVIRONMENTAL MANAGEMENT AS SET OUT IN SECTION 2 OF NEMA HAVE BEEN TAKEN INTO ACCOUNT IN THE PLANNING FOR THE PROPOSED PROJECT**

The principles of NEMA have been considered in this assessment through compliance with the requirements of the relevant legislation in undertaking the assessment of potential impacts, as well as through the implementation of the principle of sustainable development where appropriate mitigation measures have been recommended for impacts which cannot be avoided.

In addition, the successful implementation and appropriate management of this proposed Project will aid in achieving the principles of minimisation of pollution and environmental degradation.

## G. MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

### Location of the site

The site is located in the JB Marks Council Municipality, in the Dr Kenneth Kaunda District Municipality on Portion 24 and Portion 412 of the Farm Potchefstroom Town and Townlands 435 and Portion 1 of Erf 1302, Registration Division: IQ; North West Province

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Access will be obtained from R501 to Loop Street

### Preferred activity

The proposed alternative was considered based the existing bridge location and the existing stormwater canal location.

### Preferred Technology

Technology alternatives were not considered, as the applicant will be making use of the Best Practical Environmental Option.

### **Stormwater canal**

A provisional sizing for the pipe culvert is to use either 2100mm (wide) x 1200mm (deep), or 2100 x 900 units, to provide a flow capacity of minimum 2.1 m<sup>3</sup>/s. The sizing will be confirmed at the detailed design stage once the site survey has confirmed the appropriate road-, pipe- and river levels.

### **Bridge replacement**

Bridge will be designed to the SANRAL Bridge Design Code, TMH7: Code of practice for the Design of Highway Bridges and Culverts in South Africa, Part 1 (1981), Part 2 (Rev 1988) and Part 3 (1989), CSRA.

### **Sewage Network & Wastewater**

#### Gravitational pipes:

- Pipes are standard lengths, Class 34 heavy duty, solid wall uPVC pipes.
- Minimum pipe diameter is 160 mm for main lines and 110 mm for house connections (at the WWTW).

#### Rising mains:

- Minimum pipe diameter of 110 mm.
- Pipes are SABS approved, Class 12 uPVC pipes on class C bedding.
- All uPVC pipes to utilized standard uPVC push-type pressure fittings.

#### H. A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE, INCLUDING:

- i. Details of the development footprint alternatives considered;

- **Location alternatives**

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity.



**Figure 10:** Location alternatives

This alternative is in close proximity to the boreholes and all associated activities.

- **Activity alternatives**

There are no other activity alternatives for this application as the applicant deem as a potential.

- **Design and layout alternatives**

Design alternatives were considered throughout the planning and design phase (i.e. where phase 1 & phase 2 will be located?). In this regard discussions on the design were held between the EAP and the developer. The layout follows the limitations of the site and aspects such as, roads, stormwater canal, wastewater treatment plant, retention dam, bridge, irrigation reservoir & pump house.

- **No-go alternative**

Should the “no-go” alternative be identified as the preferred alternative, then the following situations will occur:

- The property will retain its current status and no construction activities will be undertaken;

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- In addition, not using the site for any activities does not provide solution to the status of the bridge.
- The existing stormwater canal will continue to pose health & safety risks as it is not well maintained.
- Irrigation water will not be treated properly if the option of a treatment plant is not considered.

Based on these reasons the “No-Go” alternative is not recommended. The environmental impacts associated with the proposed expansion are considered to be of an acceptable level and can be effectively managed with the implementation of effective mitigation methods as discussed in the EMPr.

In summary the situation on the ground will remain the same and the “do nothing alternative” will not assist the North West University in addressing issues that require quick emergency response as detailed above. The cost of the “do nothing alternative” are expected to outweigh the benefits and therefore this alternative is not a preferred alternative

## PUBLIC PARTICIPATION PROCESS

### ii. Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

## NEWSPAPER ADVERTISEMENT

An advertisement will be placed in English in the local newspaper (**Potchefstroom herald**) on **06 July 2023** (see **Appendix 5 (i)**) notifying the public of the EIA process and requesting Interested and Affected Parties (I&APs) to register with, and submit their comments to Milnex Management Services (Pty) Ltd. I&APs were given the opportunity to raise comments within 30 days of the advertisement.

## SITE NOTICES

Site notices will be placed (as anticipated on the coordinates below) on site in English to inform surrounding communities and immediately adjacent landowners of the proposed development. I&APs will be given the opportunity to raise comments. Photographic evidence of the site notices will be included in **Appendix 5 (ii)**. Below are the coordinates where the site notices will be placed.

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**Figure 11:** Site notice co-ordinates

## DIRECT NOTIFICATION AND CIRCULATION OF DRAFT BAR TO IDENTIFIED I&APS, SURROUNDING LANDOWNERS & OCCUPIERS

Identified I&APs, including key stakeholders representing various sectors, are directly informed of the proposed development and the availability of the Basic Assessment Report via registered post on **05 July 2023** and were requested to submit comments by **04 August 2023**.

Draft Basic Assessment Report (Draft BAR) can be accessed using the following manner:

- A dropbox link which will be made available during circulation
- Sent via emails
- Pick-up at the Milnex office Potchefstroom (Waterberry Street, Waterberry Square, 1st floor, Office 5B, Potchefstroom), between 7:30AM and 5PM, Monday to Thursdays and between 7:30AM and 4PM on Fridays will be made available. Prior arrangement should be made so that the documents may be prepared

For a complete list of stakeholder details and for proof of registered post see **Appendix 5 (iii)**.

The consultees included see **Appendix 5 (iv)**..

### **Table 1: List of Stakeholders, Landowners, & surrounding landowners**

Stakeholders	Landowners	Surrounding Landowner
Department of Economic Development, Environment, Conservation and Tourism (DEDECT)	Potchefstroomse Universiteit Vir Christelike Hoer Onderwys ( <b>North West University</b> )	Potchefstroomse Universiteit Vir Christelike Hoer Onderwys ( <b>North West University</b> )
The Department of Human Settlements, Water & Sanitation (DHSWS)		
Department of Agriculture, Forestry & Fisheries (DAFF)		
Provincial Heritage Resources Agency (PHRA) North West		
Department of Public Works and Roads (DPWR)		
Department of Environment, Forestry & Fisheries (DEFF)		
Department: Cooperative Governance and Traditional Affairs (DCGTA)		
Department of Local Government and Human Settlements		
Department of Rural Development and Land reform: Land Claims Commission		
Dr Kenneth Kaunda District Municipality		
WESSA (National Office)		
Municipal councilor of the ward & Municipal Manager for JB Marks Council Local Municipality		

## MEETINGS

**NB:** The interested and affected parties were given an opportunity to register by circulating, registered letters, press advert and letters.

Online/virtually methods used include Zoom or Microsoft Teams. This Meetings will be conducted upon request. If there is a need, the meetings can be arranged on site.

## ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

All comments received during the review period of the draft reports, as well as response provided will be captured and recorded within the comment and response report.

Please see **Appendix 5 (v)**.

iii. Summary of issues raised by I&APS

<b>INTERESTED AND AFFECTED PARTIES</b>		<b>ISSUES RAISED</b>	<b>EAPS RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT</b>
<b>LIST THE NAMES OF PERSONS CONSULTED IN THIS COLUMN, AND MARK WITH AN X WHERE THOSE WHO MUST BE CONSULTED WERE IN FACT CONSULTED.</b>			
<b>ORGANISATION</b>	<b>CONTACT PERSON</b>		
<b>LANDOWNER</b>			
<b>Portion 24 and Portion 412 of the Farm Potchefstroom Town and Townlands 435, and Portion 1 of Erf 1302</b>	Potchefstroomse Universiteit Vir Christelike Hoer Onderwys (North West University)	No comments received yet	
<b>SURROUNDING LANDOWNERS</b>			
<b>Erf 0/1292 Erf 0/1293 Erf 5/1263 Erf 4/1263 Erf 7/1263 Vyfhoek 254/428 Vyfhoek 253/428 Vyfhoek 252/428 Town and Townlands of Potchefstroom 368/435 Town and Townlands of Potchefstroom 23/435</b>	Potchefstroomse Universiteit Vir Christelike Hoer Onderwys (North West University)		

<b>Town and Townlands of Potchefstroom 22/435</b>			
<b>Town and Townlands of Potchefstroom 21/435</b>			
<b>Erf 0/373</b>	PUK Ontwikkelings Trust		
<b>THE MUNICIPALITY IN WHICH JURISDICTION THE DEVELOPMENT IS LOCATED</b>			
JB Marks Local Municipality	<b>Municipal Manager:</b> To whom it may concern	No comments received yet	
<b>MUNICIPAL COUNCILOR OF THE WARD IN WHICH THE SITE IS LOCATED</b>			
JB Marks Local Municipality	Ward 23 & 25 Councilors		
<b>ORGANS OF STATE HAVING JURISDICTION</b>			
Department of Economic Development, Environment, Conservation & Tourism (DEDECT)	Ouma Skosana		
The Department of Water & Sanitation (DWS)	Mr Khutjo Kwena Sekwaila (WUL Manager)		
Department of Agriculture, Forestry & Fisheries (DAFF)	Mr. Maurice Vukeya & Mrs Mpho Gumula		
Provincial Heritage Resources Agency (PHRA) North-West	Mr. Motlhabane Mosiane	No comments received yet	

Department of Public Works and Roads (DPWR)	<b>Director:</b> Mr Sfiso Diko (Roads Project Implementation)	No comments received yet	
Department of Environment, Forestry & Fisheries (DEFF)	To whom it may concern	No comments received yet	
Department: Cooperative Governance and Traditional Affairs (DCGTA)	<b>Head of Department:</b> Mr James Keatlegile Mashego	No comments received yet	
Department of Human Settlements (DHS)	<b>Head of Department:</b> Mr JK Mashego		
Department of Rural Development and Land reform: Land Claims Commission	<b>Land Claims Commissioner:</b> Regional Offices, Chief Director: Mr Lengane Bogatsu		
<b>Other-</b>			
Dr Kenneth Kaunda District Municipality.	<b>Municipal Manager:</b> Mr Mokgathe Ratlhogo		
WESSA (National Office)	Mr John Wesson	No comments received yet	

iv. The environmental attributes associated with the sites

**RESULTS OF THE ENVIRONMENTAL SENSITIVITY OF THE PROPOSED AREA (SCREENING TOOL)**

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification.

According to the **DEA Screening Report** the Environmental Sensitivity of the proposed area is as follows:

*The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.*

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY
Agriculture Theme			X	
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme	X			
Civil Aviation Theme		X		
Defence Theme				X
Paleontology Theme			X	
Plant Species Theme				X
Terrestrial Biodiversity Theme	X			

**RECEIVING ENVIRONMENT VEGETATION**

**Modified Habitat**

According to the Terrestrial Biodiversity Compliance Statement report compiled by the Biodiversity Company (2003), *the habitat unit includes all areas that maintain little to no native vegetation and/or where anthropogenic activity has substantially modified an area’s primary ecological functions and species composition. This habitat unit is characterised by lawned areas bordered by riparian habitat along the river banks, and interspersed by some trees which are predominantly alien species, such as Salix babylonica. The area is used for recreational purposes and experiences high levels of human presence.*

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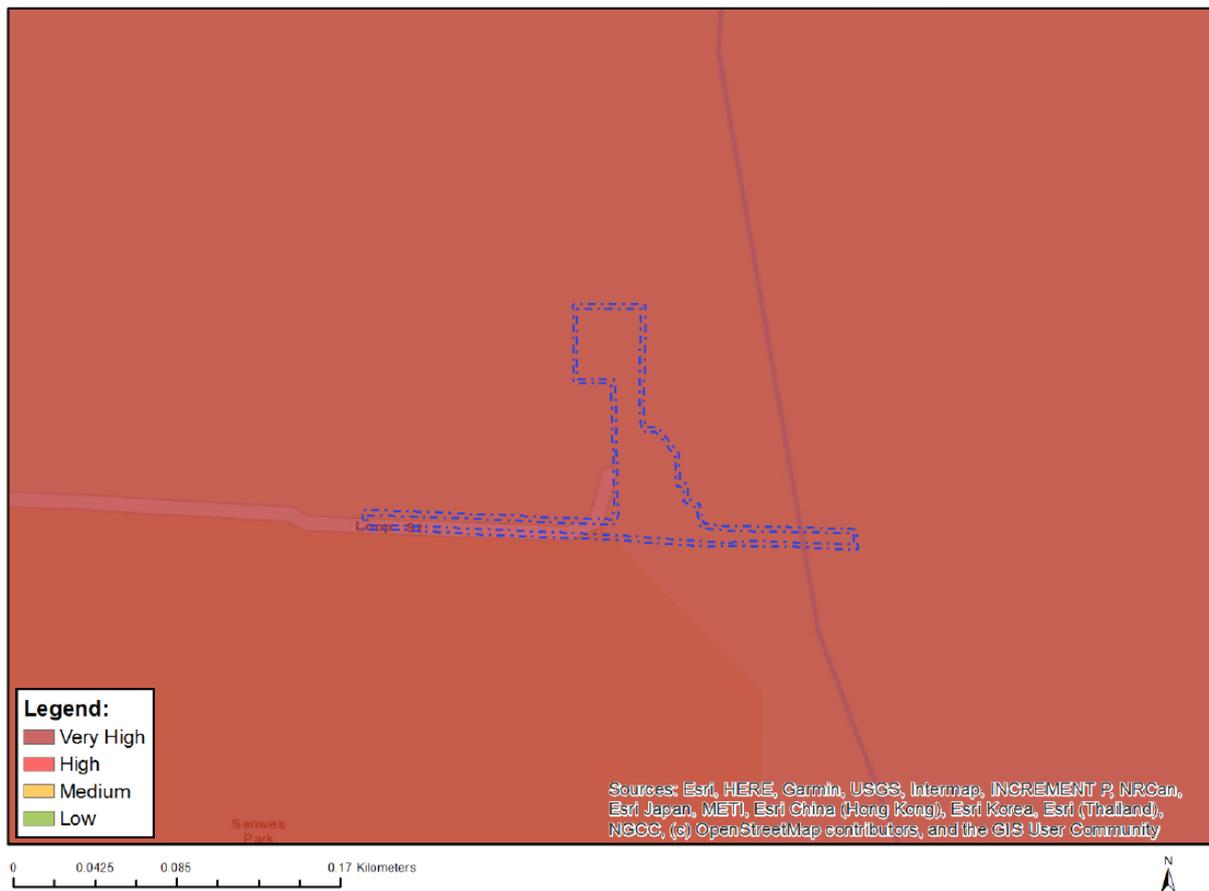
The habitat unit is made up of areas that are experiencing infestations by the NEMBA Category 1b alien invasive species, *Arundo donax* (giant reed).

The application area has the following:

- Unmaintained stormwater channel (refer to **Figure 7**)
- Existing damaged bridge (refer to **Figure 5 & 6**)
- Existing irrigation reservoir (refer to **Figure 8**)

## TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

According to the screening tool as implemented by DEA and attached as appendix 7, the application area is within a high Terrestrial Biodiversity Theme Sensitivity (See Figure 12).



**Figure 12:** Terrestrial Biodiversity Theme Sensitivity

## RIPARIAN HABITAT

Freshwater Ecological and Impact Assessment for the compiled by the Biodiversity Company (2003), *this habitat unit is characterised by the presence of the Mooi River and the surrounding riparian zone. Some indigenous tree species present in the riparian zone include, Celtis Africana, Searsia lancea and S. pyroides. Alien and invasive species include, Ulmus parvifolia, Ligustrum lucidum, Gleditsia triacanthos, Salix babylonica, Melia azedarach, Morus alba and Celtis sinensis. The provincially protected plant species, Crinum bulbispermum was also observed here, with more protected species expected in this moist area.*

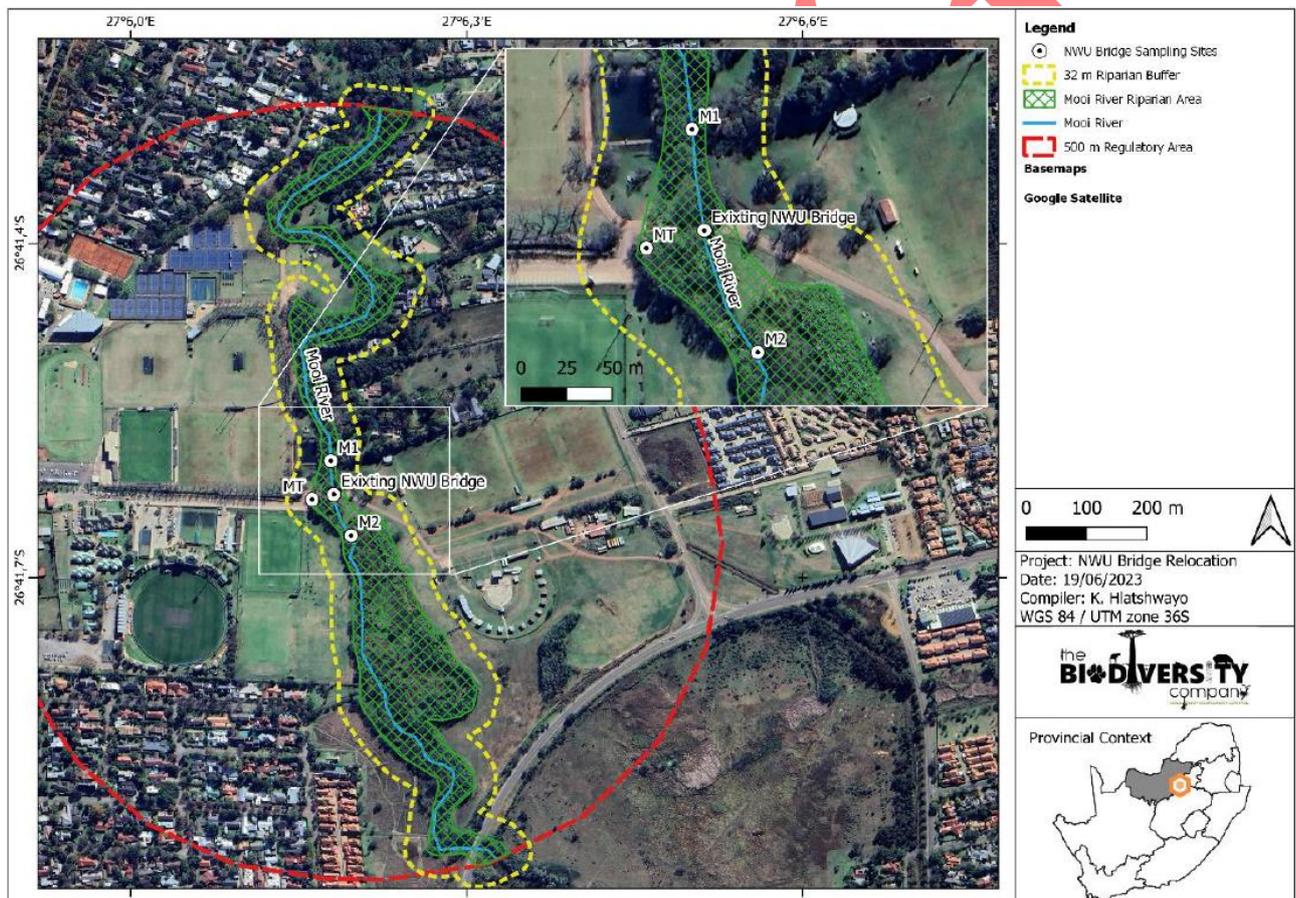


**Figure 13:** Mooirivier passing through the application area.

Milnex CC: TEN\_021 – The proposed construction of a concrete bridge over Mooirivier, with associated activities and supporting infrastructure and subsequent Environmental Impact Assessment and Water Use Licence.

Freshwater Ecological and Impact Assessment for the compiled by the Biodiversity Company (2003), *the proposed activities traverse the Mooi River and its tributaries, and therefore the project falls within the NEMA Act 107 and GA 509 regulated zones refer to Figure 14 below. In accordance with General Notice (GN) 509 of 2016 as it relates to the NWA (1998), a regulated area of a watercourse for Section 21 (c) and 21 (i) of the NWA, 1998 means the outer edge of the 1 in 100 year flood or where no flood line has been determined it means 100 m from the edge of a watercourse or a 500 m radius from the delineated boundary (extent) of any wetland or pan.*

*Listed activities in terms of the NEMA (1998), (Act 107 of 1998) EIA Regulations as amended in April 2017 must be taken into consideration if any infrastructure is to be placed within the applicable zone of regulation, which in this case is a 32 m zone of regulation.*

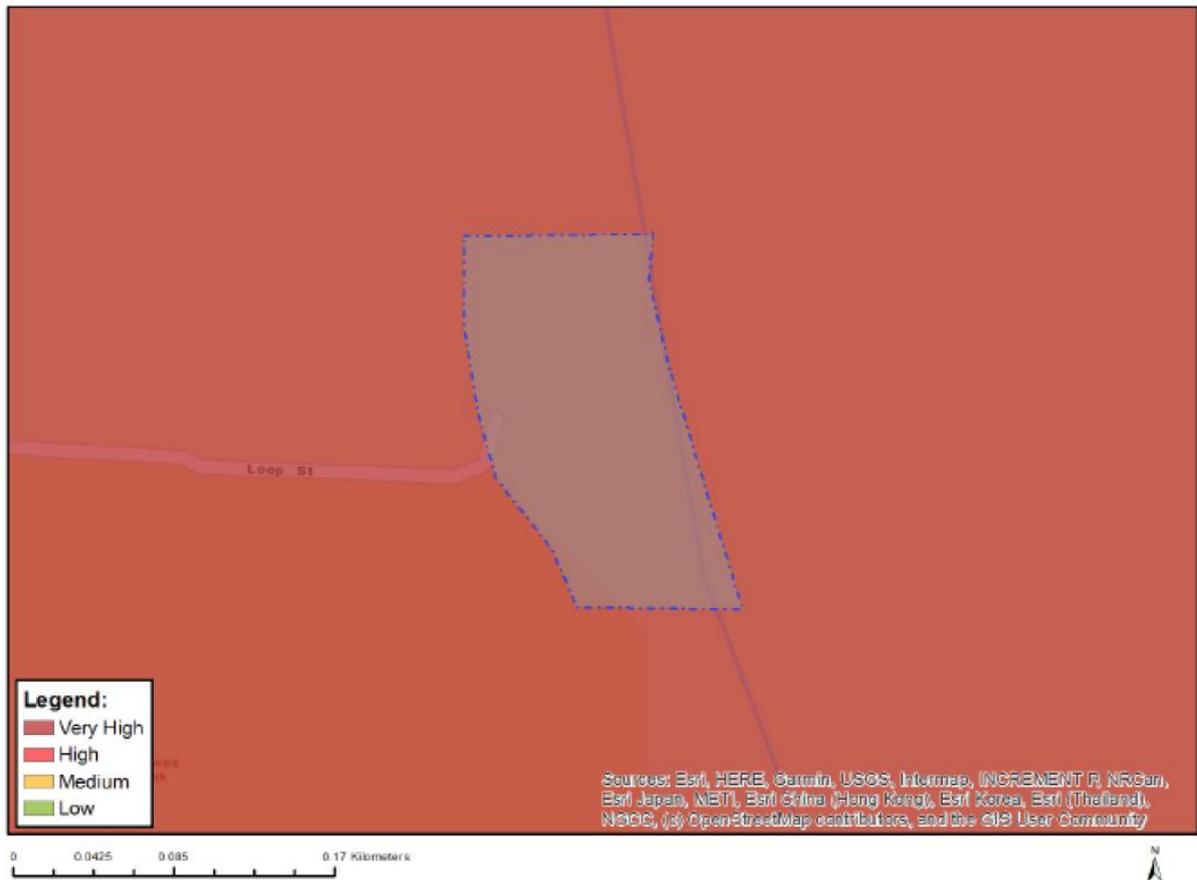


**Figure 14:** Riparian areas, regulated areas and sensitivity buffers (Figure adapted from Freshwater Ecological and Impact Assessment)

Freshwater Ecological and Impact Assessment for the compiled by the Biodiversity Company (2003), *The National Web-based Environmental Screening Tool has characterised the aquatic sensitivity of the project area as “Very High” (See Figure 15 below). This was due to the project area being within the North-West CBA1 and CBA2, River\_C, Wetlands Mesic Highveld Grassland Bioregion (Floodplain). The desktop assessment and site visit agreed with this rating. The reach is susceptible to further impacts, particularly on water quality and physical disturbances to instream and riparian habitat. The freshwater ecology of the immediate project area and further downstream areas is considered sensitive to disturbance*

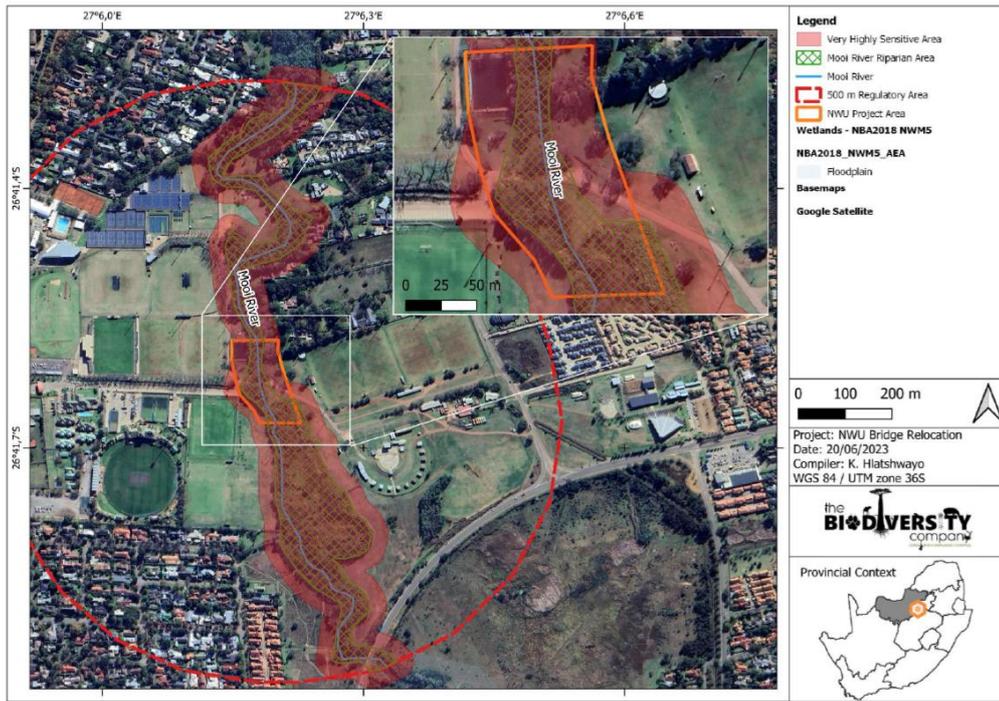
Milnex CC: TEN\_021 – The proposed construction of a concrete bridge over Moorivier, with associated activities and supporting infrastructure and subsequent Environmental Impact Assessment and Water Use Licence.

from a hydrological and biological perspective. This will include the Mooi River reach and its tributaries, which is considered sensitive due to the ecosystem services that these watercourse features provide. The construction and operational activities must take cognisance of this and avoid any unnecessary disturbance of the watercourse and riparian habitat.



**Figure 15:** Sensitivity of aquatic biodiversity features (Figure adapted from Freshwater Ecological and Impact Assessment)

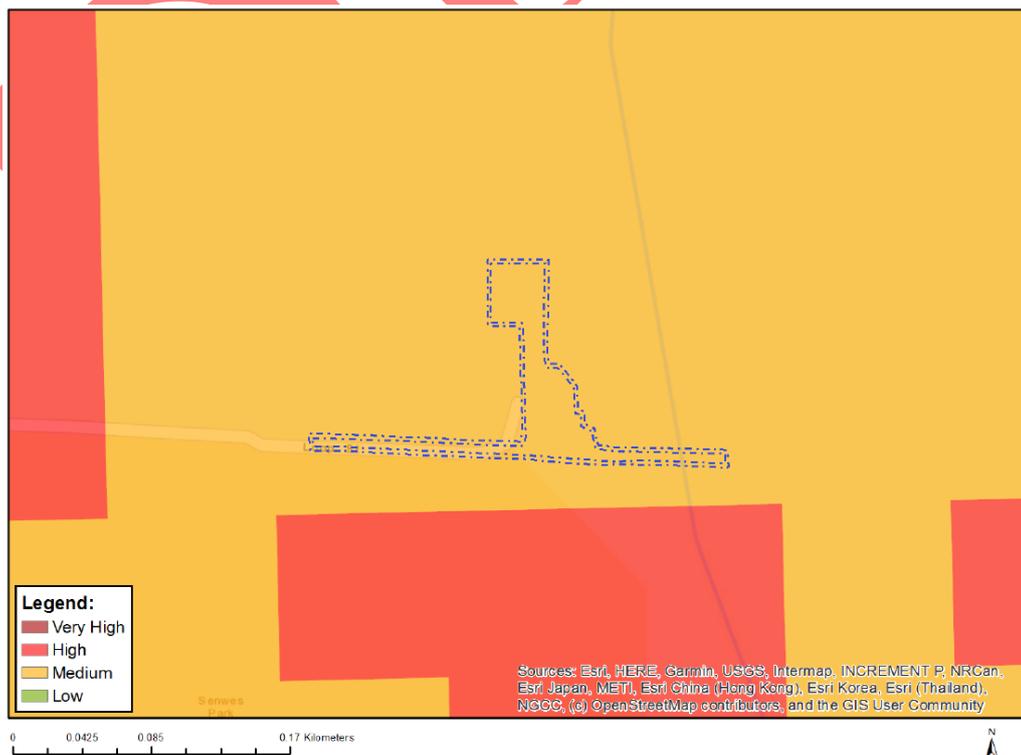
The map below illustrates aquatic sensitivity areas associated with the project.



**Figure 16:** Aquatic sensitivity areas (Figure adapted from Freshwater Ecological and Impact Assessment)

### AGRICULTURE THEME SENSITIVITY

According to the screening tool, the application area falls within a medium and some high agricultural sensitive area. Figure 17 below show that the area comprises of medium sensitivity.



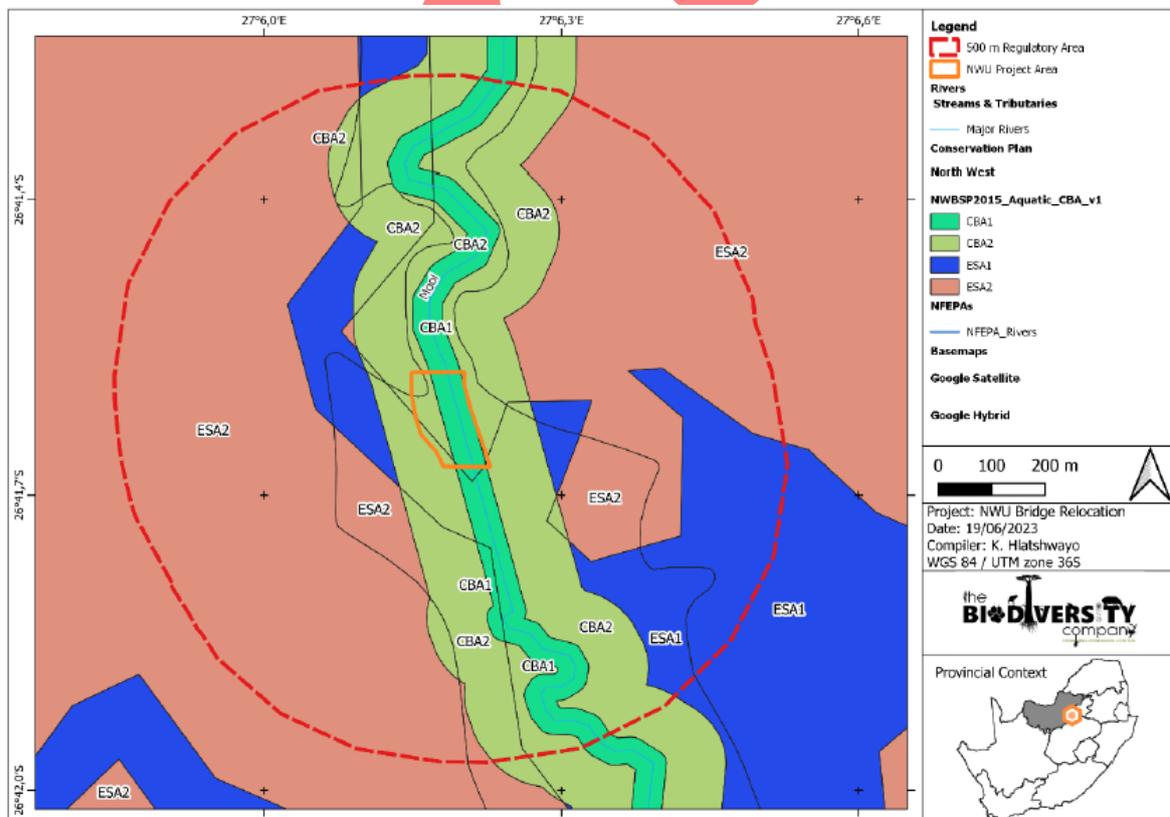
**Figure 17:** Vegetation Unit Map

## DESCRIPTION OF THE CBA

Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of high biodiversity value that need to be conserved and maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services (MTPA, 2014). According to the National Environmental Management Act (NEMA) (Act no. 107 of 1998) certain activities have strict guidelines or are prohibited within CBAs and ESAs. Refer to the listed activities under the NEMA: Environmental Impact Assessment Regulations of 2014 (GNR 982) as promulgated in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) [as amended] for a comprehensive breakdown. The following terms are used to categorise the various land used types according to their biodiversity and environmental importance:

- Critical Biodiversity Area One (CBA1);
- Critical Biodiversity Area Two (CBA2);
- Ecological Support Area (ESA);
- Other Natural Areas (ONA); and
- Protected Area (PA).

According to the Freshwater Ecological and Impact Assessment for the compiled by the Biodiversity Company (2003), *the PAOI overlaps with the North-West CBA 1 & 2 and ESA 1 & 2 and should be avoided/mitigated to preserve the biodiversity value of the CBA and the ESAs.*



**Figure 18:** CBA map of the proposed site (Figure adapted from Freshwater Ecological and Impact Assessment)

## PROTECTED AREA

Formally protected areas are protected either by national or provincial legislation. Based on the SANBI (2005) Protected Areas Map and the Northwest Biodiversity sector plan and map (2015), the study site does not overlap with any formally Protected Area.

The National Protected Area Expansion Strategy (NPAES) sets targets for protected area expansion, provides maps of the most important areas for protected area expansion, and makes recommendations on mechanisms for protected area expansion. The project area does not fall into a National Protected Area Expansion Strategy (NPAES) area (Government of South Africa, 2010) refer to **Figure 19** below.

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends (Driver et al., 2012).

Datasets have been developed to outline threatened ecosystems, with the primary objective of limiting the rate of ecosystem extinctions. Four established categories group these ecosystems namely: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) and Protected. According to data sourced from South African National Biodiversity Institute (SANBI), the proposed site is not located within any Endangered area.

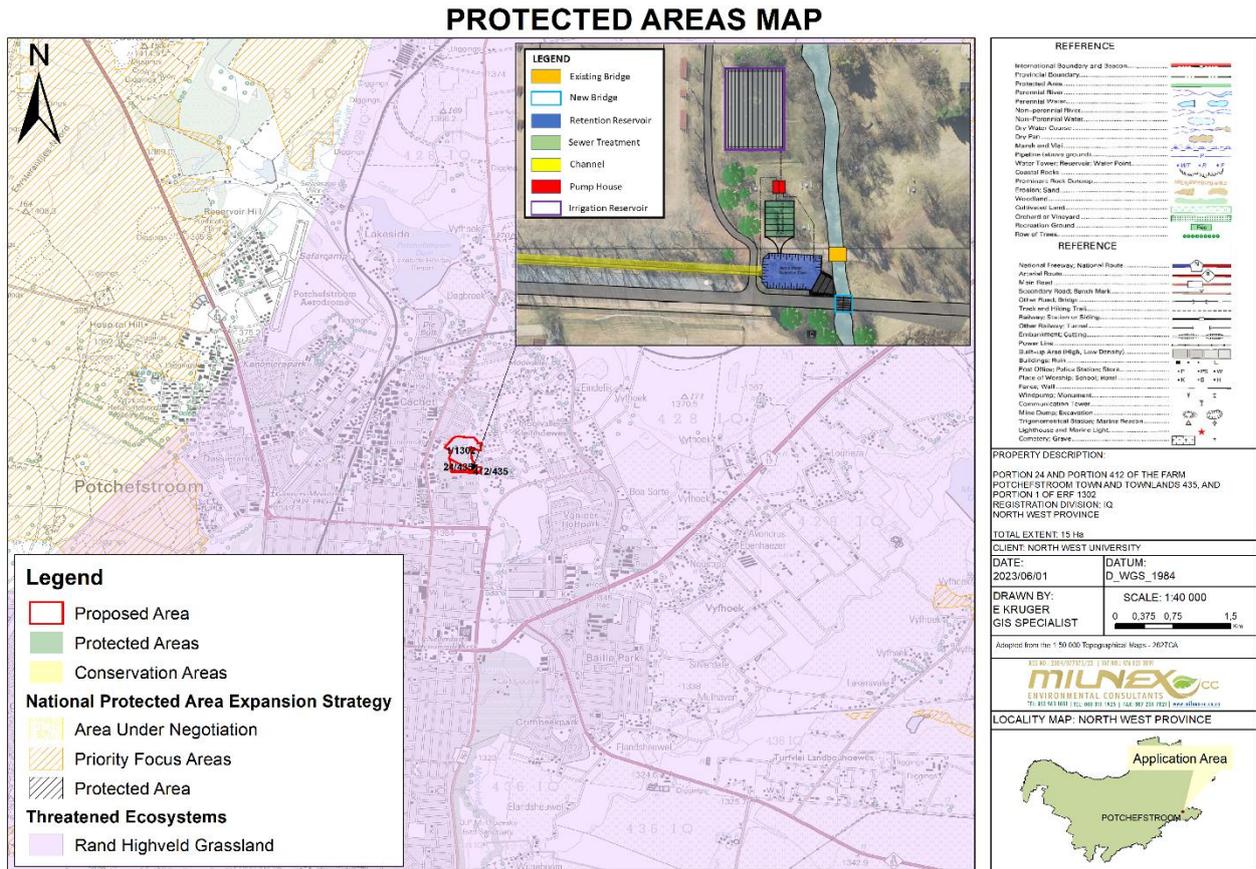


Figure 19: Protected area’ map

## DESCRIPTION OF THE SOCIO-ECONOMIC ENVIRONMENT

JB Marks Local Municipality is part of Dr Kenneth Kaunda District Municipality.

The JB Marks Local Municipality is a Category B municipality situated within the Dr Kenneth Kaunda District in the North West Province. It is the largest municipality of three in the district, making up almost half its geographical area. It was established by the amalgamation of the Ventersdorp and Tlokwe City Council Local Municipalities in August 2016.

The N12 route that connects Johannesburg and Cape Town via the city of Kimberley runs through the municipality. The main railway route from Gauteng to the Northern and Western Cape also runs through one of the municipality’s main cities, Potchefstroom. The City is 145km south-east of OR Tambo International Airport but has its own airfield, which can accommodate bigger aircraft and was formerly a military air base.

Gold mining is the dominant economic activity in the district, with Potchefstroom and Ventersdorp being the only exceptions. While Ventersdorp to the north-west of Potchefstroom focuses on agricultural activity, Potchefstroom’s economic activity is driven by services and manufacturing. A big role-player in the provision of services in Potchefstroom is the world-class North-West University, which has its main campus in Potchefstroom.

Potchefstroom’s industrial zone has many companies, focusing mainly on the industries of steel, food and chemicals, with big entities such as King Korn, Kynoch, Naschem and the Soya Protein Process (SPP) company. Within the city centre, the infrastructure of Potchefstroom supports roughly 600 businesses.

**Area:** 6 398km<sup>2</sup>

**Cities/Towns:** Potchefstroom, Ventersdorp

**Main Economic Sectors:** Agriculture, community services, manufacturing, trade, finance, transport, mining

### GROUNDWATER INVESTIGATION

According to Hydrogeological Investigation compiled by Mr. Albert Kruger, *the potential groundwater impacts from the site, direct and indirect, is summarised in Table below. In summary these potential impacts contribute to overall groundwater impacts and include: Potential alteration in groundwater quality.*

Major Aspect	Key Environmental Issues/ Potential Issues
Changes in groundwater quality: Bacteriological	The use of grey water may an effect on the quality underlying aquifer. This may include organic materials, nitrogen- and phosphorus-rich compounds, and pathogenic organisms (bacteria, viruses, and protozoa).
Changes in groundwater quality: inorganic	During excavations for buildings and tank foundations hydrocarbon based materials such as oil, grease and fuel may be spilled into the excavations. These spills may enter the underlying aquifer or Mooirivier. Spillages from construction vehicles may also contaminate the underlying aquifer or the Mooirivier.
Activities on sewer pipe	Spilling of waste water from sewer pipes. wastewater may enter the Mooirivier or underlying aquifer.

Two (2) on-site boreholes (UN-BH1 and BH2) and seven hydrocensus boreholes (HBH1 – HBH7) were identified during the field investigation conducted. Refer to Figure 20 below

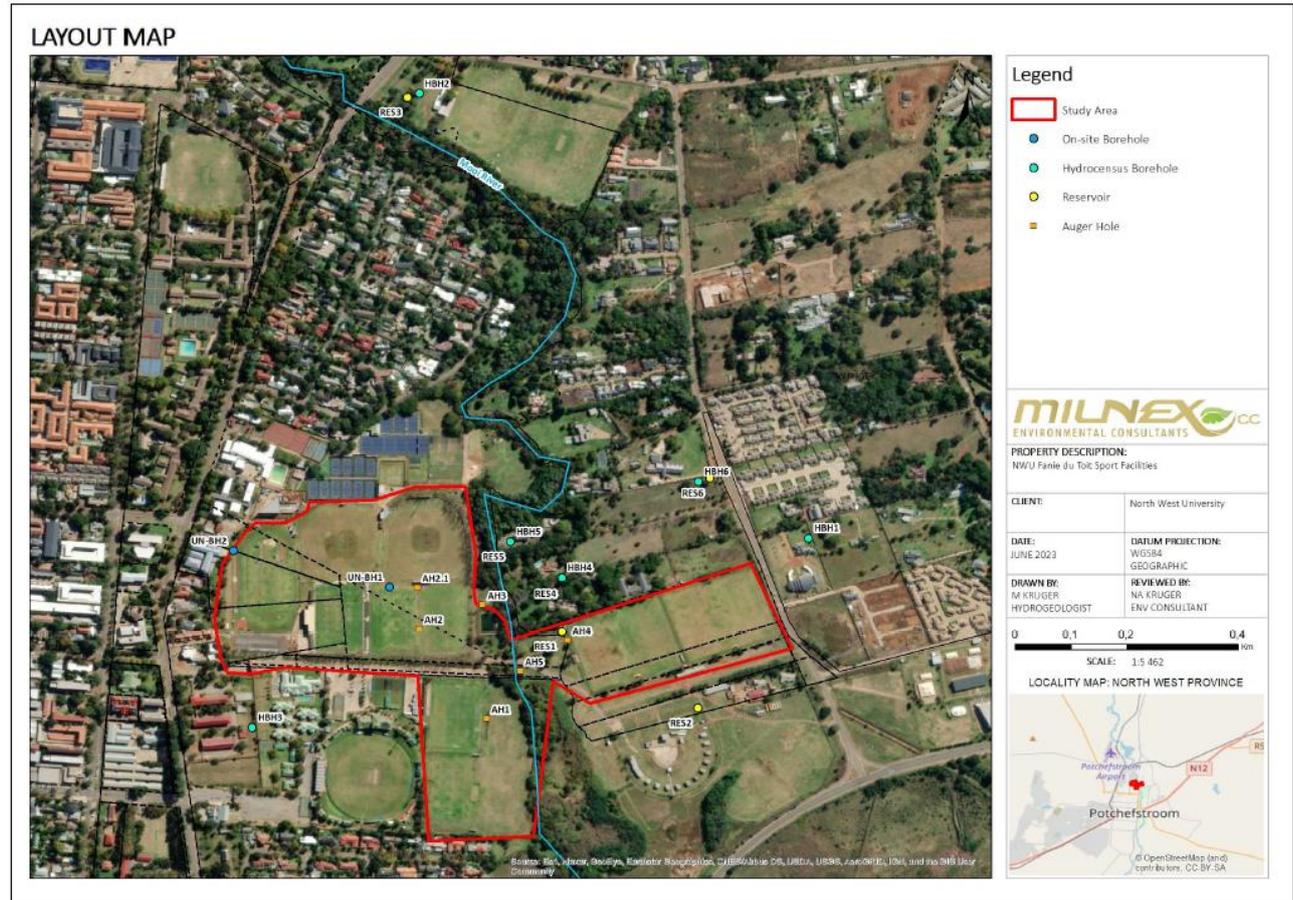


Figure 20: Hydrogeology Sampling points

## CULTURAL AND HERITAGE ASPECTS

Cultural Heritage in South Africa (includes all heritage resources) is protected by the **National Heritage Resources Act (Act 25 of 1999) (NHRA)**. According to Section 3 of the Act, all Heritage resources include **“all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens”**.

If such resources are found during the mining or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA must be contacted immediately and work must stop.

If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:

- NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance

with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;

- NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: [www.sahra.org.za](http://www.sahra.org.za)) so that mitigation can be carry out by a paleontologist.

### **Chance Find Procedure**

- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: [www.sahra.org.za](http://www.sahra.org.za)). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
- A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.

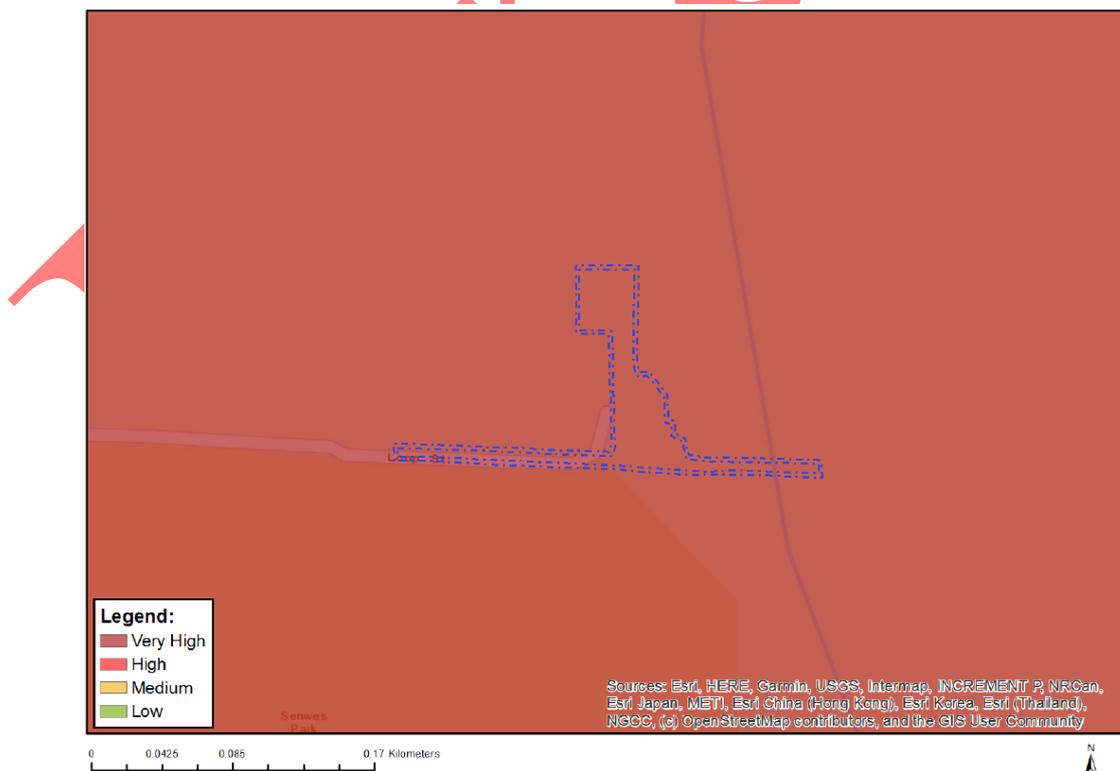
Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.

- The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

According to the Cultural Heritage Impact Assessment conducted by Francois P Coetzee, *No historical or archaeological (both Stone Age and Iron Age) artefacts, assemblages, features, structures or settlements were recorded during the survey of the project footprint. It is, however, well known that historical buildings and structures associated with the South African War (1899 – 1902) and even Late Iron Age stone-walled settlements do generally occur in Potchefstroom and surrounds.*

*It is therefore recommended, from a cultural heritage perspective that the proposed infrastructure developments may proceed, and no mitigation measures are required.*

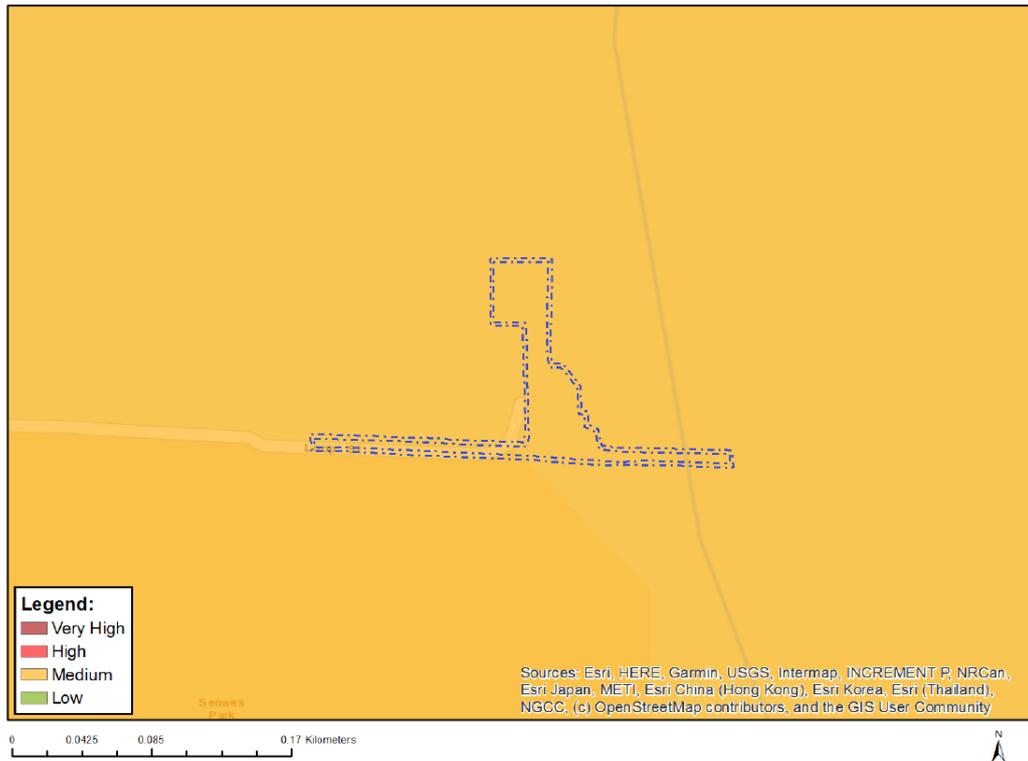
According to the screening tool, the area falls within very high Cultural and heritage aspects, refer to Figure 21 below.



**Figure 21:** Cultural and heritage aspects

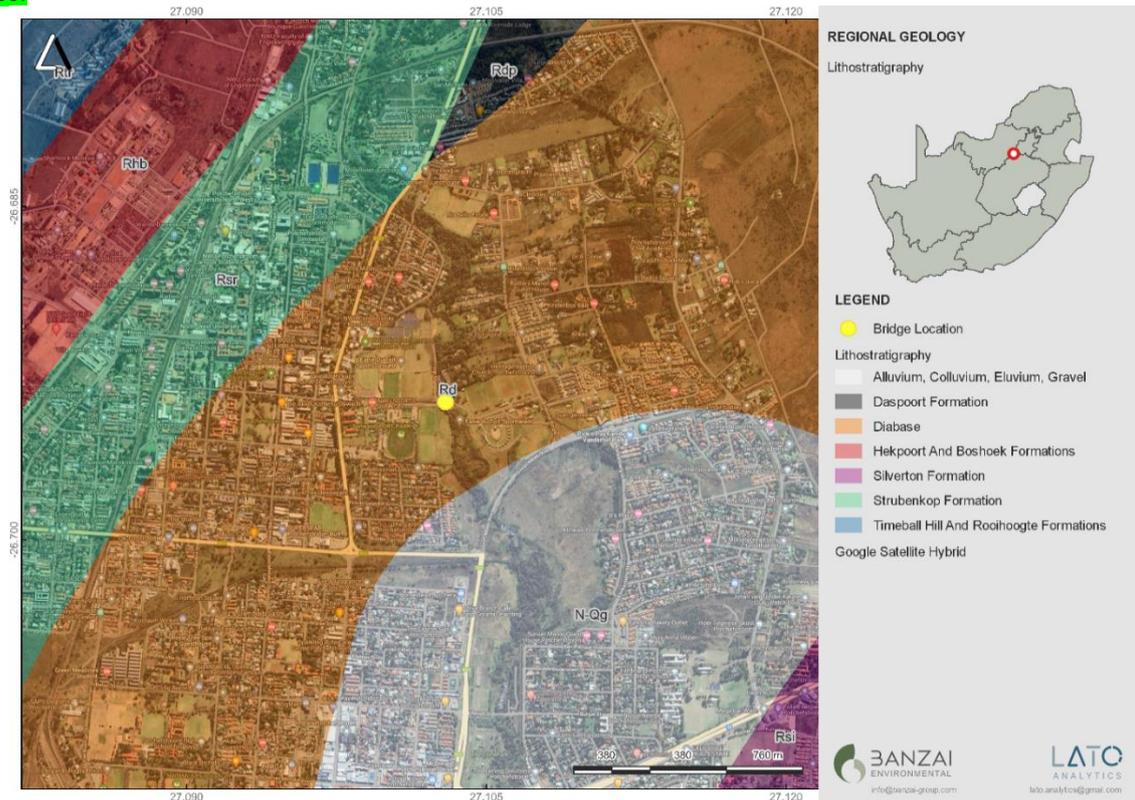
PALAEONTOLOGICAL DESKTOP ASSESSMENT

The application area falls within a medium Paleontology Theme Sensitivity. Kindly refer to Figure 22 below



**Figure 22:** Paleontology Theme Sensitivity

According to the SAHRIS Palaeosensitivity map (Figure 23 below) the proposed development is underlain by sediments with a moderate (green) Palaeontological Sensitivity.



**Figure 23:** Updated Geology (Council of Geosciences, Pretoria) of the proposed NWU development

According to the Palaeontological Desktop Assessment, Conducted by Banzai Environmental (Pty) Ltd, the proposed development on the North West University Potchefstroom Campus at Fanie du Toit Sports grounds is underlain by Quaternary alluvium. The PalaeoMap of the South African Heritage Resources Information System (SAHRIS) indicates that the Palaeontological Sensitivity of Quaternary alluvium is Moderate (Almond and Pether, 2009; Almond et al., 2013, Groenewald et al 2014). The Updated Geology (Council of Geosciences) refined the geology and indicates that the proposed development is underlain by diabase. Superficial deposits are not indicated on this map.

A Low Palaeontological Significance has thus been allocated to this development. It is therefore considered that the proposed development will not lead to detrimental impacts on the palaeontological resources of the area. The construction and operation of the project may be authorised, as the whole extent of the development footprint is not considered sensitive in terms of palaeontological heritage. If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the Environmental Control Officer (ECO) in charge of these developments must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: [www.sahra.org.za](http://www.sahra.org.za)) so that mitigation can be carry out by a palaeontologist.

It is consequently recommended that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly discovered fossils.



v. Impacts & risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

Where E = Extent, D = Duration, I = Intensity and P = Probability of occurrence											
POTENTIAL ASPECT AND/OR IMPACT	BEFORE MITIGATION				SIGNIFICANCE RATING (BEFORE MITIGATION)	MITIGATION AND MANAGEMENT MEASURES	AFTER MITIGATION				SIGNIFICANCE RATING (AFTER MITIGATION)
	E	D	I	P			E	D	I	P	
<b>PLANNING AND DESIGN PHASE</b>											
<b>Policy and legal requirements</b>											
Legal aspects and policies lined out, should be followed as failure to comply with them will result in a criminal offense and liable by penalties set out in various regulations	3	3	2	2	<b>Negative Medium (-16)</b>	<ul style="list-style-type: none"> <li>The project manager/contractor must obtain all relevant information and documentation before commencing with the proposed activity.</li> <li>The contractor must ensure that the project is done in guidance of Environmental Legislation Framework, Environmental Authorisation and is also in compliant to the Environmental Management Programmed.</li> </ul>	1	2	2	2	<b>Negative Low (-10)</b>
<b>Socio-economic Impacts</b>											
The development will result in job creation and provision of employment	2	3	2	1	<b>Positive Medium (+12)</b>	<ul style="list-style-type: none"> <li>All labour (skilled and unskilled) and contractors should be sourced locally where possible.</li> <li>A labour and recruitment policy must be developed, displayed and implemented by the contractor.</li> <li>Recruitment at the construction site will not be allowed.</li> <li>Where possible, labour-intensive practices (as opposed to mechanize) must be practiced.</li> </ul>	2	3	2	3	<b>Positive Medium (+16)</b>
<b>Environmental Awareness</b>											
Training and awareness on proper environmental management practice	2	2	2	2	<b>Positive Medium (+12)</b>	<ul style="list-style-type: none"> <li>Communication of all Environmental Issues must be conducted to all personnel, stakeholders, interested and affected parties that shall be involved in the construction and operation of the development.</li> <li>Only suitable, trained, competent and certified personnel must partake of particular duties at any point in the project implementation</li> <li>All personnel and contractors are to undergo Environmental Awareness Training.</li> <li>A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the Project Area to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr.</li> </ul>	2	3	3	3	<b>Positive High (+24)</b>

Where E = Extent, D = Duration, I = Intensity and P = Probability of occurrence											
POTENTIAL ASPECT AND/OR IMPACT	BEFORE SIGNIFICANCE				MITIGATION AND MANAGEMENT MEASURES	AFTER SIGNIFICANCE					
	MITIGATION RATING (BEFORE MITIGATION)					MITIGATION RATING (AFTER MITIGATION)					
	E	D	I	P		E	D	I	P		
					<ul style="list-style-type: none"> <li>Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided.</li> </ul>						
<b>CONSTRUCTION PHASE</b>											
<b>Traffic Impacts</b>											
Increased traffic congestion could possibly occur as a result of construction vehicles moving onto and off the site during construction. Trucks will be delivering the buildings in pack form, as well as cement, however the number of construction trips is not expected to be high. Traffic on the road is generally low, thus the impact would not be significant.	2	2	1	2	<b>Negative Low (-6)</b>	There will be no traffic congestion as result of a proposed development however notice of construction work should be placed with speed limit of 30 km/h	1	1	1	1	<b>Negative Low (-3)</b>
<b>Erosion and Sedimentation control</b>											
Sedimentation and Erosion	1	3	2	3	<b>Negative Medium (-14)</b>	<ul style="list-style-type: none"> <li>The contractor must, as an on-going exercise, implement erosion and sedimentation control measures to the satisfaction of the HSE Officer.</li> <li>The necessary compaction of the replaced sand/soil over trenches must be undertaken.</li> <li>Brushwood removed should be replaced over the disturbed area to prevent wind and water erosion and facilitate the rehabilitation process.</li> <li>Topsoil shall be stripped from all areas that are to be utilized during the construction period and where permanent structures and access is required only.</li> <li>Only the minimal vegetation must be cleared</li> <li>During construction, the contractor shall protect all areas susceptible to erosion by installing necessary temporary and permanent drainable works as soon as possible and by taking any other measures necessary to prevent stormwater from scouring slopes, banks, etc.</li> <li>Any erosion channels developed during the construction period shall be backfilled and compacted and the areas restored to a proper condition.</li> <li>Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc.</li> </ul>	1	2	1	2	<b>Negative Low (-5)</b>

Where E = Extent, D = Duration, I = Intensity and P = Probability of occurrence											
POTENTIAL ASPECT AND/OR IMPACT	BEFORE SIGNIFICANCE				MITIGATION AND MANAGEMENT MEASURES	AFTER SIGNIFICANCE					
	MITIGATION RATING (BEFORE MITIGATION)					MITIGATION RATING (AFTER MITIGATION)					
	E	D	I	P		E	D	I	P		
<b>Waste management</b>											
The construction phase will result in generation of general waste. The concrete slab, the buildings will arrive on site in a pack form therefore will no large quantities of waste will be generated during the construction phase of the project. Domestic waste will also be generated.	1	2	2	2	<b>Negative low (-10)</b>	<ul style="list-style-type: none"> <li>All solid waste generated during construction, other than natural materials such as soil and rock, shall be disposed of off-site to the landfill site.</li> <li>Different types of waste should be separated and placed in different bins/skips.</li> <li>Refuse collection and storage must be done in a way that will not cause a health nuisance.</li> <li>Construction personnel should be instructed not to dump any building materials on the untransformed vegetation around the site.</li> <li>All waste is to be disposed of at the landfill site.</li> <li>Waste Bins should be positioned around the site for use by construction personnel. These bins should be emptied and waste transported to the landfill site.</li> <li>Under no circumstances is waste to be burnt or buried on site.</li> </ul>	1	1	1	1	<b>Negative Low (-3)</b>
<b>Fauna and Flora Impacts</b>											
Impacts on flora species of conservation importance (including suitable habitat)	2	3	2	3	<b>Negative Medium (-16)</b>	<ul style="list-style-type: none"> <li>All alien plant species must be removed and should be replaced with indigenous vegetation.</li> <li>All informal fires on the property shall be prohibited specifically during the construction, operational and rehabilitation phases of the proposed development.</li> <li>Reduce the negative fragmentation effects of the development and enable the safe movement of fauna species;</li> <li>Prevent the direct and indirect loss and disturbance of flora and fauna species and communities; and</li> <li>The contractor shall be responsible for informing all employees about the need to prevent any harmful effects on natural vegetation on or around the construction sites as a result of their activities.</li> <li>Vegetation clearing shall take place in a phased manner in order to retain vegetation cover for as long as possible.</li> <li>Reseed cleared areas to prevent soil erosion.</li> <li>All construction areas must be demarcated prior construction to ensure that the footprint of impacts are limited organic materials are removed from the area to be cleared.</li> <li>Fencing should not impact on indigenous plants.</li> </ul>	1	1	2	2	<b>Negative low (-8)</b>

Where E = Extent, D = Duration, I = Intensity and P = Probability of occurrence										
POTENTIAL ASPECT AND/OR IMPACT	BEFORE SIGNIFICANCE				MITIGATION AND MANAGEMENT MEASURES	AFTER SIGNIFICANCE				
	MITIGATION RATING (BEFORE MITIGATION)					MITIGATION RATING (AFTER MITIGATION)				
	E	D	I	P		E	D	I	P	
					<ul style="list-style-type: none"> <li>All indigenous plant material removed from the cleared areas shall be stockpiled and mulching. All remaining vegetation shall be removed and disposed-off in a landfill site</li> </ul>					
Impacts on fauna species of conservation importance (including suitable habitat)	1	2	2	3	<b>Negative Medium (-12)</b> <ul style="list-style-type: none"> <li>No domestic pets are permitted on site.</li> <li>Structures (e.g. gutters, drains, sumps, ditches) must be designed, as far as possible, so that they do not act as pitfall traps for small creatures, i.e. they should either have gently sloping edges or be adequately covered to prevent creatures from falling into them.</li> </ul>	1	1	1	2	<b>Negative Low (-4)</b>
<b>Surface Water Contamination</b>										
There will be concrete mixing in order to construct the concrete slab, if care is not taken, there could be spillages which could have adverse impacts on ground and surface water during wet weather conditions.	2	2	3	2	<b>Negative medium (-12)</b> <ul style="list-style-type: none"> <li>Sufficient ablution facilities should be provided during the construction phase and these facilities should be maintained.</li> <li>Cement mixing shall only be done at specifically selected areas.</li> <li>Cleaning of cement mixing and handling equipment shall be done using proper cleaning trays.</li> <li>Implement spill prevention and waste design controls measures.</li> <li>Implement soil mitigation measures.</li> </ul>	1	2	2	1	<b>Negative Low (-8)</b>
<b>Stormwater management</b>										
The construction phase may result in possible storm water issues on site dependent on rain capacity at the time however the impact will be minimal since site surrounding is vegetation.	3	2	2	3	<b>Negative Medium (-14)</b> <ul style="list-style-type: none"> <li>In terms of SABS 0400-1990 of the National Building Regulations, on site drainage will be provided prior to construction to combat soil erosion.</li> <li>The storm water system, especially the discharge points, must be monitored</li> <li>No waste or refuse must be allowed to access the storm water infrastructure.</li> <li>Storm water should be channeled within site</li> <li>Stormwater plans should be in place to ensure that water does not reach the Mooiriver.</li> <li>Should this be adequately implemented, the risks to the system may be considered low</li> </ul>	2	2	1	2	<b>Negative Low (-6)</b>
<b>Noise Impacts</b>										
During the construction phase there is likely to be an increase in noise pollution from construction vehicles and construction staff.	2	2	2	2	<b>Negative Medium (-12)</b> <ul style="list-style-type: none"> <li>Noise must be kept to an absolute minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals.</li> <li>No construction activities may be undertaken on Sunday.</li> </ul>	1	2	1	1	<b>Negative Low (-4)</b>

Where E = Extent, D = Duration, I = Intensity and P = Probability of occurrence											
POTENTIAL ASPECT AND/OR IMPACT	BEFORE SIGNIFICANCE				MITIGATION AND MANAGEMENT MEASURES	AFTER SIGNIFICANCE					
	MITIGATION RATING (BEFORE MITIGATION)					MITIGATION RATING (AFTER MITIGATION)					
	E	D	I	P		E	D	I	P		
					<ul style="list-style-type: none"> <li>Provide all equipment with standard silencers. Maintain silencer units in vehicles and equipment in good working order.</li> <li>All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability.</li> <li>Construction staff working in area where the 8-hour ambient noise levels exceed 60 dBA must have the appropriate Personal Protective Equipment (PPE).</li> <li>All operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No. 85 of 1993).</li> </ul>						
<b>Safety and security</b>											
Increased economic activities could result in impacts such as crime.	2	2	2	2	<b>Negative Medium (-12)</b>	<ul style="list-style-type: none"> <li>Clear sign boards should be erected at the entrance to the site to indicate that a construction area is being entered and safety precautions should be followed.</li> <li>Notification signs must be posted around the site warning residents and visitors about the hazards around the construction site.</li> </ul>	2	2	2	1	<b>Negative Low (-10)</b>
<b>Air quality</b>											
Dust will remain minimal since this is not anticipated to be a busy or labour intensive construction site	2	1	2	1	<b>Negative Low (-8)</b>	<ul style="list-style-type: none"> <li>The speed of vehicles within the site to be strictly controlled to between 20 - 30km/h.</li> <li>Areas generating dust particles should be sprinkled with water to reduce dust blowing out over the area and should be enclosed where possible to mitigate effects of wind on them.</li> <li>Use environmentally friendly cleaning and dust suppressant products.</li> <li>The clearing of vegetation should be limited to the development area and should be undertaken prior to the commencement of construction activities</li> </ul>	1	1	1	1	<b>Negative low (-3)</b>
<b>Odour Nuisance</b>											
Site Clearing: Removal of topsoil and vegetation	1	2	1	1	<b>Negative Low (-4)</b>	<ul style="list-style-type: none"> <li>No odour impacts are envisaged during the construction phase</li> </ul>	1	2	1	1	<b>Negative Low (-4)</b>
<b>Groundwater quality impacts</b>											
Sewage spills when working on the sewer line	2	1	2	1	<b>Negative Low (-8)</b>	<p>It is expected that without mitigation a medium negative impact can be expected. Mitigation will include:</p> <ul style="list-style-type: none"> <li>Ensure that all cut off valves are properly closed before commencing any work;</li> <li>Ensure that all liquids and solids within the section to be worked on is properly drained;</li> </ul>	1	1	2	1	<b>Negative Low (-6)</b>

Where E = Extent, D = Duration, I = Intensity and P = Probability of occurrence										
POTENTIAL ASPECT AND/OR IMPACT	BEFORE SIGNIFICANCE RATING (BEFORE MITIGATION)				MITIGATION AND MANAGEMENT MEASURES	AFTER SIGNIFICANCE RATING (AFTER MITIGATION)				
	MITIGATION					MITIGATION				
	E	D	I	P		E	D	I	P	
					<ul style="list-style-type: none"> <li>Impermeable sheets may be placed underneath the sections of be to be worked on to ensure that the waste material do not infiltrate into the subsurface;</li> <li>No work should be conducted on the sewage line during rainfall events to ensure that the wastewater do not infiltrate the subsurface soil and to prevent surface runoff that may enter the Mooirivier.</li> </ul>					
Hydrocarbon spills	2	2	3	2	<p><b>Negative Medium (-18)</b></p> <p>It is expected that without mitigation a medium negative impact can be expected. Mitigation will include:</p> <ul style="list-style-type: none"> <li>Drip trays should be placed underneath all construction vehicles, when vehicles are stationary;</li> <li>Do not service any vehicle within 500m of the Mooirivier;</li> <li>Spill kits should be available at all times;</li> <li>All construction workers should be familiar with the use of spill kits and the relevant spill protocols on site;</li> <li>All fuel containers should be placed on top of a bunded impermeable layer to ensure that the hydrocarbon product does spill onto the subsurface soil;</li> <li>All hydrocarbon spills should be reported.</li> </ul>	2	1	2	1	<p><b>Negative Low (-8)</b></p>
<b>Damage to heritage resources</b>										
The Heritage Impact Assessment undertaken for the site did not identify any heritage resources on the site.					<p><b>N/A</b></p> <p>As per the HIA, no heritage resources, of the type and range outlined in Section 3 of the National Heritage Resources Act, 1999 occur on the site. Therefore, no impact is anticipated during the construction phase. Once excavations commence it is, however, possible that heritage resources may be exposed by project activities, and in such cases a chance Find Protocol must be implemented. A paleontological screening was conducted using the South African Heritage Resource Agency (SAHRA) sensitivity screening map (<a href="https://sahris.sahra.org.za/map/palaeo">https://sahris.sahra.org.za/map/palaeo</a>). The findings from the site indicates that the project area has an insignificant to zero sensitivity of fossil remains to be found and therefore a paleontological assessment is not required</p> <p>No mitigation measures are recommended, except in the case of the uncovering of a heritage resource:</p> <ul style="list-style-type: none"> <li>Implement Chance Find Protocol.</li> </ul>					

**OPERATIONAL PHASE**

Where E = Extent, D = Duration, I = Intensity and P = Probability of occurrence											
POTENTIAL ASPECT AND/OR IMPACT	BEFORE SIGNIFICANCE				MITIGATION AND MANAGEMENT MEASURES	AFTER SIGNIFICANCE					
	MITIGATION RATING (BEFORE MITIGATION)					MITIGATION RATING (AFTER MITIGATION)					
	E	D	I	P		E	D	I	P		
<b>Odour Nuisance</b>											
Storage and treatment of sewage effluent	2	3	3	4	<b>Negative High (-27)</b>	<ul style="list-style-type: none"> <li>Through the operation of the new plant, unpleasant odours will be emitted, resulting in improved air quality.</li> <li>Unpleasant odour might emanate during the temporary storage of sludge, prior to disposal off site.</li> <li>The tanks and pipes must remain sealed to prevent odours</li> </ul>	1	2	2	2	<b>Negative Low (-10)</b>
<b>Energy and water usage</b>											
Energy consumption.	2	2	2	2	<b>Negative Medium (-12)</b>	<ul style="list-style-type: none"> <li>It is recommended that renewable energy options and/or alternative energy sources be listed as the preferred options.</li> </ul>	1	1	1	2	<b>Negative Low (-4)</b>
<b>Groundwater quality impacts due to on-site contamination sources:</b>											
Grey water irrigation	2	3	3	2	<b>Negative High (-21)</b>	<p>It is expected that without mitigation a medium negative impact can be expected. Mitigation will include:</p> <ul style="list-style-type: none"> <li>The quality of the grey water to be used as irrigation water must be monitored for quality on a regular basis to ensure that the underlying aquifer is not impacted on. The water quality should comply with GN665 standards as per section 21 (e) of the water;</li> <li>Groundwater monitoring is essential for ensuring that the groundwater is not impacted. The use of monitoring boreholes will act as an early detection mechanism for groundwater contamination;</li> <li>The use of appropriate chemicals and procedures to ensure that the microorganisms do not contaminate the water resource is crucial;</li> <li>Irrigation cycles should be climatically orientated where irrigation does not take place on the sports field when they are saturated due to precipitation. Irrigating fields during times where the fields are saturated may lead to surface water runoff and can cause pollution of the Mooiriver. Soil moisture probes can be installed to aid in irrigation schedules.</li> <li>Irrigation should not cause waterlogging or excess drainage below the plant roots zone. If the water is applied at sustainable rates (i.e., using smaller amounts frequently rather than large volumes occasionally), water logging should not be a problem. This method also helps to maximise moisture uptake and minimize potential leaching;</li> </ul>	2	2	1	2	<b>Negative Low (-7)</b>

Where E = Extent, D = Duration, I = Intensity and P = Probability of occurrence											
POTENTIAL ASPECT AND/OR IMPACT	BEFORE SIGNIFICANCE RATING (BEFORE MITIGATION)				MITIGATION AND MANAGEMENT MEASURES	AFTER SIGNIFICANCE RATING (AFTER MITIGATION)					
	E	D	I	P		E	D	I	P		
					<ul style="list-style-type: none"> <li>Vegetative cover in the buffer area between the irrigated area and any watercourse should be maintained wherever possible, particularly riparian vegetation, to minimise the movement of runoff and eroded soil into surface waters;</li> <li>Stormwater plans should be in place to ensure that water does not reach the Mooiriver.</li> </ul>						
<b>Traffic</b>											
Vehicular access and movement of construction activities	2	1	2	2	<b>Negative low (-10)</b>	<ul style="list-style-type: none"> <li>Adhere to all safety measures that are in place on site, such as speed limits, safety signs and safe following distance.</li> <li>Heavy machinery operators and truck drivers should be instructed to stay in designated construction site and roads.</li> </ul>	1	1	2	2	<b>Negative low (-8)</b>
<b>Wastewater Treatment Works</b>											
The operation of the treatment plant	2	2	3	3	<b>Negative high (-21)</b>	<ul style="list-style-type: none"> <li>Treated effluent quality must meet target water quality limits for recreational use as described by DWAF (1996b) before used for irrigation. If this is to be used on crops then the standards need to be re-evaluated;</li> <li>An independent wastewater treatment professional should be appointed to monitor and audit the WWTW on a regular basis and ensure the quality of final effluent conforms to legal DWAF quality standards;</li> <li>Sulphurous odours are normally the first indication that the WWTW is not functioning optimally. The source of odour must be investigated immediately and appropriate corrective measures taken;</li> <li>During operation of the WWTW all sewerage infrastructure must be properly and regularly managed, maintained and operated throughout the life of the project;</li> <li>During operation, periodic inspections of the WWTW infrastructure should be implemented to identify any system failure which could lead to contamination of the groundwater and surrounding watercourses;</li> <li>Any leaks and failures of the sewerage infrastructure must be fixed immediately and areas rehabilitated as needed;</li> <li>Emergency overflow infrastructure is to be constructed to convey excess flows to temporary storage pond(s) where feasible; and</li> </ul>	2	1	2	2	<b>Negative low (-10)</b>

Where E = Extent, D = Duration, I = Intensity and P = Probability of occurrence											
POTENTIAL ASPECT AND/OR IMPACT	BEFORE SIGNIFICANCE				MITIGATION AND MANAGEMENT MEASURES	AFTER SIGNIFICANCE					
	MITIGATION RATING (BEFORE MITIGATION)					MITIGATION RATING (AFTER MITIGATION)					
	E	D	I	P		E	D	I	P		
					<ul style="list-style-type: none"> <li>Routine monitoring of discharge points should be conducted to identify areas prone to erosion and bank collapse. Problem areas should be addressed immediately.</li> </ul>						
<b>Irrigation Reservoir lining</b>											
Storage of treated water in the reservoir	2	1	2	2	<b>Negative low (-10)</b>	<ul style="list-style-type: none"> <li>The irrigation dam should be progressively emptied over a week so as to minimize the increased flow within the system;</li> <li>After construction the irrigation dam should be progressively filled in order to minimize the effects of the abstraction on the systems flow;</li> <li>Laydown area cannot be within the delineated watercourse or buffer area;</li> <li>All spillways must be regularly monitored and maintained/revegetated;</li> <li>The current pump house must be investigated and maintained;</li> <li>A storm water management plan must be compiled; and</li> </ul>	2	2	1	2	<b>Negative Low (-6)</b>
<b>Soil Contamination</b>											
The soil may be contaminated if there are leaks in the pipes.	1	3	2	3	<b>Negative Medium (-14)</b>	<ul style="list-style-type: none"> <li>The contractor must ensure that drip trays are always be available to collect any fluid that may result from accidental spillage, overflow and/or servicing.</li> <li>All equipment that leaks must be repaired immediately and/or removed from the site when necessary.</li> <li>Stockpile soil in the correct layers, avoid excessive height, and slope</li> <li>All contaminated soil shall be treated in situ or removed and be placed in containers.</li> </ul>	1	2	2	1	<b>Negative low (-8)</b>
<b>Storm Water Management</b>											
During the operational phase, the development will probably render a portion of the site with impermeable surfaces. This will result in increased storm water runoff post-development. The concrete slabs will increase storm water runoff.	1	3	2	2	<b>Negative medium (-12)</b>	<ul style="list-style-type: none"> <li>An appropriate stormwater management plan must be developed and implemented to the site.</li> <li>Adequate measures must be put in place to prevent polluted runoff water from entering the, wetland and soil, thus preventing surface and groundwater pollution;</li> <li>Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse.</li> </ul>	1	3	2	1	<b>Negative low (-10)</b>
<b>Socio-economic</b>											

Where E = Extent, D = Duration, I = Intensity and P = Probability of occurrence										
POTENTIAL ASPECT AND/OR IMPACT	BEFORE SIGNIFICANCE RATING (BEFORE MITIGATION)				MITIGATION AND MANAGEMENT MEASURES	AFTER SIGNIFICANCE RATING (AFTER MITIGATION)				
	E	D	I	P		E	D	I	P	
The proposed development will result in long term employment opportunities for the locals and supply them with skills development.	2	2	3	2	<b>Positive medium (+18)</b> <ul style="list-style-type: none"> <li>• Socially, various employment opportunities exist with the construction as well as the operational phase of the sewage treatment plant.</li> <li>• Overall, the plant will have a high positive impact on the social and environmental benefits of the university &amp; the municipality both directly and indirectly.</li> <li>• Payment should comply with applicable Labour Law legislation in terms of minimum wages.</li> </ul>	2	3	3	4	<b>Positive high (+27)</b>
<b>DECOMMISSION</b>										
<b>N/A</b>										

DRAFT

- vi. The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives

**METHODOLOGY**

The potential environmental impacts associated with the project will be evaluated according to its nature, extent, duration, intensity, probability and significance of the impacts, whereby:

- **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 and as such bracketing ranges are often required. 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.

CRITERIA	DESCRIPTION			
<b>EXTENT</b>	<b>National (4)</b>  The whole of South Africa	<b>Regional (3)</b>  Provincial and parts of neighbouring provinces	<b>Local (2)</b>  Within a radius of 2 km of the construction site	<b>Site (1)</b>  Within the construction site
<b>DURATION</b>	<b>Permanent (4)</b>  Mitigation either by man or natural process will not occur in such a way	<b>Long-term (3)</b>  The impact will continue or last for the entire operational life of	<b>Medium-term (2)</b>  The impact will last for the period of the	<b>Short-term (1)</b>  The impact will either disappear with mitigation or will be mitigated

	or in such a time span that the impact can be considered transient	the development, but will be mitigated by direct human action or by natural processes thereafter. The only class of impact which will be non-transitory	construction phase, where after it will be entirely negated	through natural process in a span shorter than the construction phase
<b>INTENSITY</b>	<b>Very High (4)</b>  Natural, cultural and social functions and processes are altered to extent that they permanently cease	<b>High (3)</b>  Natural, cultural and social functions and processes are altered to extent that they temporarily cease	<b>Moderate (2)</b>  Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way	<b>Low (1)</b>  Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected
<b>PROBABILITY OF OCCURANCE</b>	<b>Definite (4)</b>  Impact will certainly occur	<b>Highly Probable (3)</b>  Most likely that the impact will occur	<b>Possible (2)</b>  The impact may occur	<b>Improbable (1)</b>  Likelihood of the impact materializing is very low

CRITERIA FOR THE RATING OF CLASSIFIED IMPACTS

<b>Low impact (3 - 10 points)</b>	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.
<b>Medium impact (11 - 20 points)</b>	Mitigation is possible with additional design and construction inputs.
<b>High impact (21 - 30 points)</b>	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
<b>Very high impact (31 - 48 points)</b>	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a “very high impact” is likely to be a fatal flaw.
<b>Status</b>	Denotes the perceived effect of the impact on the affected area.
<b>Positive (+)</b>	Beneficial impact.
<b>Negative (-)</b>	Deleterious or adverse impact.
<b>Neutral (/)</b>	Impact is neither beneficial nor adverse.

It is important to note that the status of an impact is assigned based on the status quo – i.e. should the project not proceed. Therefore, not all negative impacts are equally significant.

Significance is determined through a synthesis of impact characteristics. Significance is 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 calculation of the significance of an impact uses the following formula: **(Extent + duration + probability) x magnitude/intensity.**

- vii. The positive & negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment & the community that may be affected.

The main impacts associated with the proposed project include:

#### **Socio – Economic Impacts**

- The construction phase will result in additional temporary job opportunities;
- The proposed project will increase the local Gross Domestic Product (GDP) through the provision of employment and support to other businesses in the area;
- Permanent job opportunities will be made available for the operation and maintenance of the wastewater treatment plant

#### **Odour Nuisance**

- Nuisance to surrounding land owners as a result of odour emissions;

#### **Visual Impacts**

- With the clearing of vegetation, the landscape will be more visible.
- Construction materials, activity and infrastructure will be increasingly visible.

#### **Soil Impacts**

- Loss of soil resources as a result of soil stripping of the construction footprint;
- Sterilisation of soil resources as a result of hydrocarbon/chemical/waste contamination;
- Possibility of erosion as a result of runoff from cleared and compacted areas resulting in the soil instability and loss of soil resources;
- Soil contamination as a result of uncontrolled stormwater runoff or wash water runoff;
- Soil contamination as a result of uncontrolled sewage handling;
- Indirect impact on the loss of micro habitats following soil removal.
- Soil erosion as a result of runoff from cleared areas and poorly constructed stormwater drainage system;
- Soil contamination as a result of accidental spillages of hazardous substances.

#### **Surface Water Impacts**

- Possible contamination of surface water resources as a result of contaminated runoff;
- Possible contamination of surface water resources and wetlands as a result of uncontrolled waste handling and disposal;

- Possible contamination of surface water resources and wetlands as a result of uncontrolled usage of hazardous substances;
- Sedimentation of surface water resources as a result of runoff from cleared areas;
- Inadequately designed greywater and wash water disposal systems could result in overflow (due to increase in wastewater volume) and the subsequent contamination of surface water;
- Contamination of surface water resources as a result of uncontrolled waste handling and disposal;
- The concrete slabs will increase storm water runoff resulting in erosion and possible sedimentation.

#### **Groundwater Impacts**

- Potential alteration in groundwater quality.
- Impact on groundwater quality as a result of soil pollution due to the usage of hazardous substances on site;
- Impact on groundwater as a result of uncontrolled waste handling;
- Impact on groundwater quality as a result of over abstraction from the existing borehole;
- Impact on water quality as a result of uncontrolled storage of hazardous substances and waste management;

#### **Air Quality Impacts**

- Impact on air quality as a result of the dust generation from cleared areas
- Unpleasant odour might emanate during the temporary storage of sludge, prior to disposal off site.
- Impact on air quality as a result of Volatile Organic Compounds (VOC) emissions from machinery and increased vehicle usage;
- Impact on air quality as a result of exhaust emissions and dust generation.

#### **Noise Impacts**

- Preparation activities will result in the generation of noise over a period of months. Sources of noise are likely to include vehicles, the use of machinery such as back actors and people working on the site. The noise impact is likely to be significant; but activities should be limited to normal working days and hours.

#### **Community Noise**

Community noise impacts should not exceed the levels presented in Table below of South African Standards or result in a maximum increase above background levels of 3 dBA at the nearest receptor location off-site.

- The noise levels are relevant to noise impacts beyond the property boundary of the facility. However, noise prevention and mitigation measures should be applied where predicted or measured noise impacts from a project facility or operations exceed the applicable noise level guideline at the most sensitive point of reception. A point of reception or receptor may be defined as any point on the premises occupied by persons where extraneous noise and/or vibration are received.

- South African National Standard (SANS) 10103 (2008) provides a guideline for estimating community response to an increase in the general ambient noise level caused by intruding noise.

SITE	WHO / IFC LAEQ (1H) DBA		SOUTH AFRICAN STANDARDS	
	DAY 07:00 – 19:00	NIGHT 19:00 – 07:00	DAY 07:00 – 19:00	NIGHT 19:00 – 07:00
	Residential; Institutional; Educational	55	45	55
Industrial, Commercial	70	70	70	60

The possible noise and increased ground vibration during blasting and mine activities can however be controlled by means of approved acoustic screening measures, state of the art equipment, proper noise management principles, compliance to the Local Noise Regulations, and the International Finance Corporation’s Environmental Health and Safety Guidelines.

**Land Use and Land Capability Impacts**

- Temporary loss of land use and land capability as a result of the clearance of land;
- Sterilisation of land as a result of soil pollution and erosion.

**Cultural and Heritage Impacts**

- Destruction of cultural and heritage artefacts found underground;
- Destruction of alternation of buildings older than 60 years.

**Fauna and Flora Impacts**

- Disturbance of fauna and flora habitats as a result of site clearing;
- Disturbance of faunal species, including those of adjacent landowners, as a result of noise generation;
- Loss of faunal species during construction activities;
- Potential to indirectly increase the risk of the spread of alien vegetation;
- Potential impact on surrounding fauna and flora as a result of incorrect waste storage and handling;
- Potential impact on surrounding biodiversity as a result of contaminated runoff;
- Proliferation of alien vegetation in disturbed areas.

**Safety, Security and Health**

- Safety risk of contractors, due to increased construction activity;
- Health risks as a result of waste generation and storage;

**Dust suppression**

It was the intention of the applicant to implement dust management on site to determine if unacceptable levels of dust fallout occur. Monitoring compliance with the requirements of the National Dust Control Regulations for an activity, in terms of nuisance or disturbance.

The National Framework for Air Quality Management in the Republic of South Africa (the National Framework), as published under Government Notice No. 1144 of 26 October 2018, underpins NEM:AQA by providing national norms and standards for air quality management to ensure compliance with legislation. The National Framework serves as the country’s AQMP.

Section 32 of the NEM:AQA makes provision for the Minister or the MEC to prescribe measures for the control of dust in specific places or areas, or by specified machinery or in specific instances. While dust generally does not pose a health risk, it may be regarded as a nuisance. It is the responsibility of the owner of the dust generating activity to take reasonable measures to limit the nuisance factor.

With respect to this, the Minister has published in the gazette the regulations for the control of dust in 2013 (Notice 827, Government Gazette No. 36974). These regulations provide requirements for measures for the control of dust, which includes the requirements for monitoring, dust management plan development and implementation and reporting.

Section 3. Dustfall standard

**Table 1. Acceptable dust fall rates**

Restriction Areas	Dustfall rate (D) (mg/m <sup>2</sup> /day, 30-day average)	Permitted frequency of exceeding dust fall rate
Residential Area	D < 600	Two within a year, not sequential months
Non-residential Area	600 < D < 1200	Two within a year, not sequential months

viii. the possible mitigation measures that could be applied and level of residual risk

No adverse environmental or social impacts associated with the agricultural activity have been identified through the BAR process. Mitigation measures as set out in the Environmental Management Programme (EMPr) attached in Part B must be implemented in order to minimise any potential impacts.

All comments received during the review period of the BAR report, as well as response provided is captured and recorded within the Comments and Response Report and will be attached in the final BAR.

ix. the outcome of the site selection matrix;

Matrix analysis

The matrix describes the relevant listed activities, the aspects of the development that will apply to the specific listed activity, a description of the environmental issues and potential impacts, the significance and magnitude of the potential impacts, and the mitigation of the potential impacts. The matrix also highlights areas of particular concern, which requires more in depth assessment. Each cell is evaluated individually in terms of the nature of the impact, duration and its significance – should no mitigation measures be applied. This is important since many impacts would not be considered insignificant if proper mitigation measures were implemented. The matrix also provides an indication if mitigation measures are available.

In order to conceptualise the different impacts the matrix specify the following:

- **Stressor:** Indicates the aspect of the proposed activity, which initiates and cause impacts on elements of the environment.
- **Receptor:** Highlights the recipient and most important components of the environment affected by the stressor.
- **Impacts:** Indicates the net result of the cause-effect between the stressor and receptor.
- **Mitigation:** Impacts need to be mitigated to minimise the effect on the environment.

- x. if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity.

The applicant does not have an alternative site.

- xi. a concluding statement indicating the preferred alternatives, including preferred location of the activity;

The applicant opted for this site as is the most economically feasible. It is located within an existing agricultural footprint which makes it easy and cost effective to utilise existing infrastructure. It has a strategic advantage in that it is located near to a major road and has a good, existing access road. The site is also shielded by trees growing along the boundary facing the main road which will reduce the visual impact.

- I. FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE (IN RESPECT OF THE FINAL SITE LAYOUT PLAN) THROUGH THE LIFE OF THE ACTIVITY.

- i. A description of all environmental issues and risks that are identified during the environmental impact assessment process

### **Process for the identification of key issues**

The methodology for the identification of key issues aims, as far as possible, to provide a user-friendly analysis of information to allow for easy interpretation.

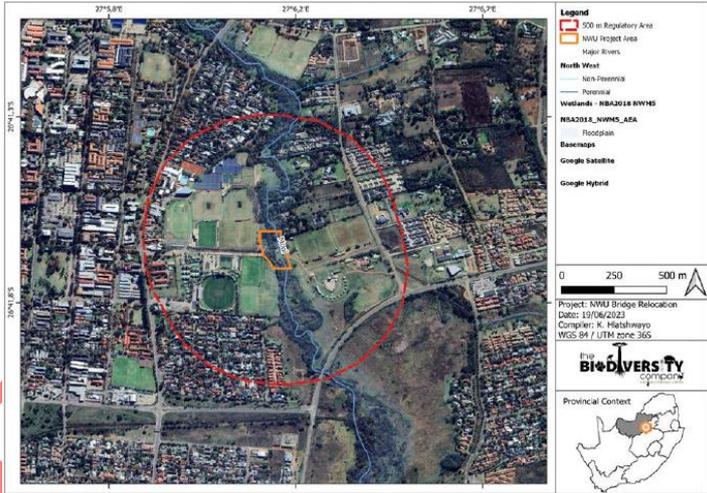
- **Checklist:** The checklist consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts.
- **Matrix:** The matrix analysis provides a holistic indication of the relationship and interaction between the various activities, development phases and the impact thereof on the environment. The method aims at providing a first order cause and effect relationship between the environment and the proposed activity. The matrix is designed to indicate the relationship between the different stressors and receptors which leads to specific impacts. The matrix also indicates the specialist studies, which will be submitted as part of the Environmental Impact Report in order to address the potentially most significant impacts.

### **Checklist analysis**

The site visit was conducted to ensure a proper analysis of the site specific characteristics of the study area. The table below provides a checklist, which is designed to stimulate thought regarding possible consequences of specific actions and so assist scoping of key issues. It consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts. The table highlights certain issues, which are further analysed in matrix format.

**Table:** Environmental checklist

QUESTION	YES	NO	Un-sure	Description
<b>1. Are any of the following located on the site earmarked for the development?</b>				
I. A river, stream, dam or wetland	X			The proposed project area is located within the C23H-01653-Mooi Sub Quaternary Reach and traverses regulated areas of the Mooi River.
II. A conservation or open space		X		None
III. An area that is of cultural importance		X		A heritage Impact Assessment was conducted & no heritage resources could be identified.
IV. Site of geological significance			X	
V. Areas of outstanding natural beauty		X		

VI. Highly productive agricultural land		×	Even though the area falls within Class 3 of agricultural potential, the area has been transformed.
VII. Floodplain	×		<p>According to the Freshwater Ecological and Impact Assessment for the compiled by the Biodiversity Company (2003), the area is has the presence of River (Mooi River), and the Floodplain within the PAOI.</p> 
VIII. Indigenous forest			×
IX. Grass land	×		Secondary grassland
X. Bird nesting sites	×		Due to site being adjacent the Mooi Rivier, birds nests are expect/may be found on site.
XI. Red data species			×
XII. Tourist resort	×		NWU Sports Village is within the application area
<b>2. Will the project potentially result in potential?</b>			
I. Removal of people		×	None.
II. Visual Impacts	×		Yes
III. Noise pollution	×		Foreseen sources of noise associated with the activities may likely come from to include vehicles, employees & the activities. This unlikely to be significant.
IV. Construction of an access road		×	None. Access will be obtained from R501
V. Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air.		×	None.

VI. Accumulation of large workforce (>50 manual workers) into the site.	×			Approximately 10 Skilled & Unskilled people employment opportunities will be created during the construction and operational phase of the project.
VII. Utilisation of significant volumes of local raw materials such as water, wood etc.	×			Water to be used for the for construction phase from boreholes
VIII. Job creation	×			Approximately 10 Skilled & Unskilled people employment opportunities will be created during the construction and operational phase of the project.
IX. Traffic generation		×		None.
X. Soil erosion		×		Areas will be cleared gradually
XI. Installation of additional bulk telecommunication transmission lines or facilities		×		None.
XII. Air Pollution				Limited dust will be generated during the construction phase by the offloading of construction material, the excavation of the topsoil and the removal of vegetation.  The principles of the act in reducing emissions thereby protecting the environment and adjacent land uses will be taken cognisance of. The only increase in dust during the operational phase will be from the minor increase in vehicle movement on the access roads.

**3. Is the proposed project located near the following?**

I. A river, stream, dam or wetland	×			Moorivier
II. A conservation or open space area	×			
III. An area that is of cultural			×	
IV. A site of geological			×	
V. An area of outstanding		×		None
VI. Highly productive agricultural			×	
VII. A tourist resort	×			
VIII. A formal or informal	×			

## J. AN ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

### i. Cumulative impacts

Cumulative impacts are those impacts which when assessed in isolation may produce impacts that are environmentally acceptable but which when combined with other impacts, may become significant. The potential cumulative impacts that have been identified for the proposed development are as follows;

- Waste Management;
- Storm water management;
- Security and Safety; and
- Socio Economic Impacts.

The proposed development will fit into the existing farming in the area and contribute to employment availability due to the proposed nature of the development it is expected that the proposed development will generate job opportunities for both skilled and unskilled labourers during the construction and operational phases of development.

Cumulative impacts are caused by the accumulation and interaction of multiple stresses affecting the parts and the functions of the ecosystems. Of particular concern is the knowledge that ecological/biophysical systems sometimes change abruptly and unexpectedly in response to apparently small incremental stresses.

Cumulative impacts can be defined as “...changes to the environment caused by an activity in combination with other past, present, and reasonably foreseeable human activities...” The cumulative impacts have been assessed qualitatively and can be further understood with the accumulation of information from the surrounding area as the project continues.

The cumulative impacts of the activities will be discussed according to the environment that is affected by the project activities. All impacts from the surrounding land will be taken into account.

ASPECTS OF THE DEVELOPMENT /ACTIVITY	POTENTIAL IMPACTS		SIGNIFICANCE AND MAGNITUDE OF POTENTIAL IMPACTS			MITIGATION OF POTENTIAL IMPACTS	SPECIALIST STUDIES / INFORMATION	
	Receptors	Impact description	Minor	Major	Duration	Possible Mitigation		
<b>CONSTRUCTION PHASE</b>								
Site clearing and preparation	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	<ul style="list-style-type: none"> <li>Loss or fragmentation of indigenous natural vegetation.</li> <li>Loss of sensitive species.</li> <li>Loss or fragmentation of habitats.</li> </ul>	-		L	Yes	-
		Air quality	<ul style="list-style-type: none"> <li>Air pollution due to the increase of traffic.</li> </ul>			M	Yes	-
		Soil	<ul style="list-style-type: none"> <li>Soil degradation, including erosion.</li> <li>Disturbance of soils and existing land use (soil compaction).</li> <li>Loss of agricultural potential (low significance relative to agricultural potential of the site).</li> </ul>			M	Yes	-
		Geology	<ul style="list-style-type: none"> <li>It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa.</li> </ul>	N/A	N/A	N/A	N/A	-
		Existing services infrastructure	<ul style="list-style-type: none"> <li>Generation of waste that need to be accommodated at a licensed landfill site.</li> <li>Generation of sewage that need to be accommodated by the local sewage plant.</li> </ul>	-		M	Yes	-
		Ground water	<ul style="list-style-type: none"> <li>Pollution due to construction vehicles.</li> </ul>			M	Yes	-
		Surface water	<ul style="list-style-type: none"> <li>Increase in storm water run-off.</li> <li>Pollution of water sources due to soil erosion.</li> <li>Destruction of watercourses (pans/dams/streams).</li> </ul>			L	Yes	-
	SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	<ul style="list-style-type: none"> <li>Job creation.</li> <li>Skills development.</li> </ul>		+	M	N/A	-
		Visual landscape	<ul style="list-style-type: none"> <li>Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility due to dust.</li> </ul>	-		S	Yes	-
		Traffic volumes	<ul style="list-style-type: none"> <li>Increase in construction vehicles.</li> </ul>	-		S	Yes	-

		Health & Safety	<ul style="list-style-type: none"> <li>Air/dust pollution.</li> <li>Road safety.</li> </ul>		-	S	Yes	-
		Noise levels	<ul style="list-style-type: none"> <li>The generation of noise as a result of construction vehicles, and people working on the site.</li> </ul>	-		M	Yes	-
		Tourism industry	<ul style="list-style-type: none"> <li>The application area is within North West University and is close to NWU Sports Village hotel</li> </ul>	N/A	N/A	N/A	N/A	-
		Heritage resources	<ul style="list-style-type: none"> <li>Removal or destruction of archaeological and/or paleontological sites.</li> <li>Removal or destruction of buildings, structures, places and equipment of cultural significance.</li> </ul>	N/A	N/A	N/A	N/A	HIA Study to confirm
<b>OPERATIONAL PHASE</b>								
<p>The key components of the proposed project are described below:</p> <ul style="list-style-type: none"> <li>Roads – No major roads will be constructed for this project, Access will be obtained from R501</li> </ul>	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	<ul style="list-style-type: none"> <li>Fragmentation of habitats.</li> <li>Establishment and spread of declared weeds and alien invader plants (operations).</li> </ul>	-	-	L	Yes	-
		Air quality	<ul style="list-style-type: none"> <li>Air pollution due to the trucks and Vehicles in &amp; out of the application area.</li> </ul>	N/A	N/A	N/A	N/A	-
		Soil	<ul style="list-style-type: none"> <li>Soil degradation, including erosion.</li> <li>Disturbance of soils and existing land use (soil compaction).</li> <li>Loss of agricultural potential (low significance relative to agricultural potential of the site).</li> </ul>	-		S	Yes	-
		Geology	<ul style="list-style-type: none"> <li>Collapsible soil.</li> <li>Seepage (shallow water table).</li> <li>Active soil (high soil heave).</li> <li>Erodible soil.</li> <li>The presence of undermined ground.</li> <li>Instability due to soluble rock.</li> <li>Steep slopes or areas of unstable natural slopes.</li> <li>Areas subject to seismic activity.</li> <li>Areas subject to flooding.</li> </ul>		-	S	Yes	-
		Existing services infrastructure	<ul style="list-style-type: none"> <li>Generation of waste that need to be accommodated at a licensed landfill site.</li> <li>Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant.</li> </ul>	-		L	Yes	-
		Ground water	<ul style="list-style-type: none"> <li>Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies.</li> </ul>	-		L	Yes	-

		Surface water	<ul style="list-style-type: none"> <li>Increase in storm water runoff. The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion.</li> <li>Destruction of watercourses (pans/dams/streams).</li> <li>Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies.</li> </ul>		-	L	Yes	-
	SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	<ul style="list-style-type: none"> <li>Job creation.</li> <li>Skills development.</li> </ul>		+	L	Yes	-
		Visual landscape	<ul style="list-style-type: none"> <li>Bridge &amp; the wastewater treatment plant</li> </ul>		-	L	Yes	-
		Traffic volumes	<ul style="list-style-type: none"> <li>Increase in vehicles collecting gravel for distribution.</li> </ul>	-		S	Yes	-
		Health & Safety	<ul style="list-style-type: none"> <li>Air/dust pollution.</li> <li>Road safety.</li> </ul>			S	Yes	-
		Noise levels	<ul style="list-style-type: none"> <li>The proposed development will result in noise pollution during the operational phase.</li> </ul>	-	-	L	Yes	-
		Tourism industry	<ul style="list-style-type: none"> <li>The application area is within North West University and is close to NWU Sports Village hotel</li> </ul>	N/A	N/A	N/A	N/A	-
		Heritage resources	<ul style="list-style-type: none"> <li>It is not foreseen that the proposed activity will impact on heritage resources or vice versa.</li> </ul>	N/A	N/A	N/A	N/A	HIA Study to confirm

(N/A) No impact (+) Positive Impact (-) Negative Impact (S) Short Term (M) Medium Term (L) Long Term

**K. SUMMARY OF THE KEY FINDINGS OF THE ENVIRONMENTAL IMPACT ASSESSMENT**

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

According to the DEA Screening Report, eleven (11) specialist assessments needs to be conducted, please see the table below for the list of these studies and also our response.

<b>Specialist assessments needed according to the DEA Screening Report:</b>	<b>Response</b>
Landscape/Visual Impact Assessment	<p>We do not see the purpose for this study as there is an existing bridge and associated infrastructure around the proposed development.</p> <p>When the layout of the proposed development were considered, the following was taken into consideration:</p> <ul style="list-style-type: none"> <li>• The location and arrangement of Erven in the layout plan was carefully considered in order to create viable stands, whilst retaining the existing character of the application site.</li> <li>• Aspects, such as the visual effects, climate, topography, surface drainage, noise pollution, archaeological aspects and hydrological aspects, have been taken into careful consideration.</li> <li>• Provision is to be made to allow for the buildings and structures, to harmonise with each other, and to blend with the surrounding environment.</li> </ul>
Archaeological and Cultural Heritage Impact Assessment	The study was conducted by Francois P Coetzee in June 2023. Refer to the study conducted.
Palaeontology Impact Assessment	The Palaeontological Desktop Assessment, Conducted by Banzai Environmental (Pty) Ltd.
Terrestrial Biodiversity Impact Assessment	Terrestrial Biodiversity Compliance Statement & Freshwater Ecological and Impact Assessment were conducted in June 2023.
Aquatic Biodiversity Impact Assessment	
Plant Species Assessment	
Animal Species Assessment	
Hydrology Assessment	Hydrogeological Investigation was conducted June 2023.
Traffic Impact Assessment	the proposed development will have few trips daily and will have a small effect on the existing.

Socio-Economic Assessment	We do not see the need for this study as the proposed development will contribute positively to the socio-economic
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The application was guided by the screening tool and the below table on the sensitivity.

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVITY
Agriculture Theme			<b>X</b>	
Animal Species Theme		<b>X</b>		
Aquatic Biodiversity Theme	<b>X</b>			
Archaeological and Cultural Heritage Theme	<b>X</b>			
Civil Aviation Theme		<b>X</b>		
Defence Theme				<b>X</b>
Paleontology Theme			<b>X</b>	
Plant Species Theme				<b>X</b>
Terrestrial Biodiversity Theme	<b>X</b>			

## L. ENVIRONMENTAL IMPACT STATEMENT

### i. Summary of the key findings of the environmental impact assessment:

This section provides a summary of the assessment and conclusions drawn from the proposed prospecting area. In doing so, it draws on the information gathered as part of the environmental impact assessment process and the knowledge gained by the environmental consultant during the course of the process and presents an informed opinion on the environmental impacts associated with the proposed project. The following conclusions can be drawn for the proposed prospecting activity:

- **Potential impacts on biodiversity:** According to the critical biodiversity, the proposed area overlaps with the North-West CBA 1 & 2 and ESA 1 & 2 and should be avoided/mitigated to preserve the biodiversity value of the CBA and the ESAs.
- **Potential impacts on land use:** The farm is currently utilised for recreational purposes.
- **Positive impacts:** Agricultural activities will have socio-economic benefit to the area
- **Potential social impacts:** The presence of construction workers poses a potential risk to family structures and social networks. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks.
- **Potential negative impacts:** (noise, dust, soil degradation, storm water, traffic, health and safety) associated with the operation of the facility are expected to be of low-medium impact, of medium terms and site specific. These can be mitigated or negated through the implementation of practical and appropriate mitigation measures.

All possible negative impacts and risks that have been identified in this report can be effectively mitigated and managed by implementing the migratory measures as set out in the Environmental Management Programme (EMPr) It is therefore recommended that the environmental authorisation for the prospecting right be granted.

- ii. Map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers.
- iii. Summary of the positive and negative implications and risks of the proposed activity and identified alternatives

There are regional socio-economic benefits due to the agriculture in the North West Province and greater knowledge is gained on the agriculture of South Africa. All possible negative impacts and risks that have been identified in this report can be effectively mitigated and managed by implementing the mitigation measures as set out in the Environmental Management Programme (EMPr) attached in Part B. No significantly adverse social or environmental impacts are anticipated.

**M. PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPr**

**Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.**

Management objectives include:

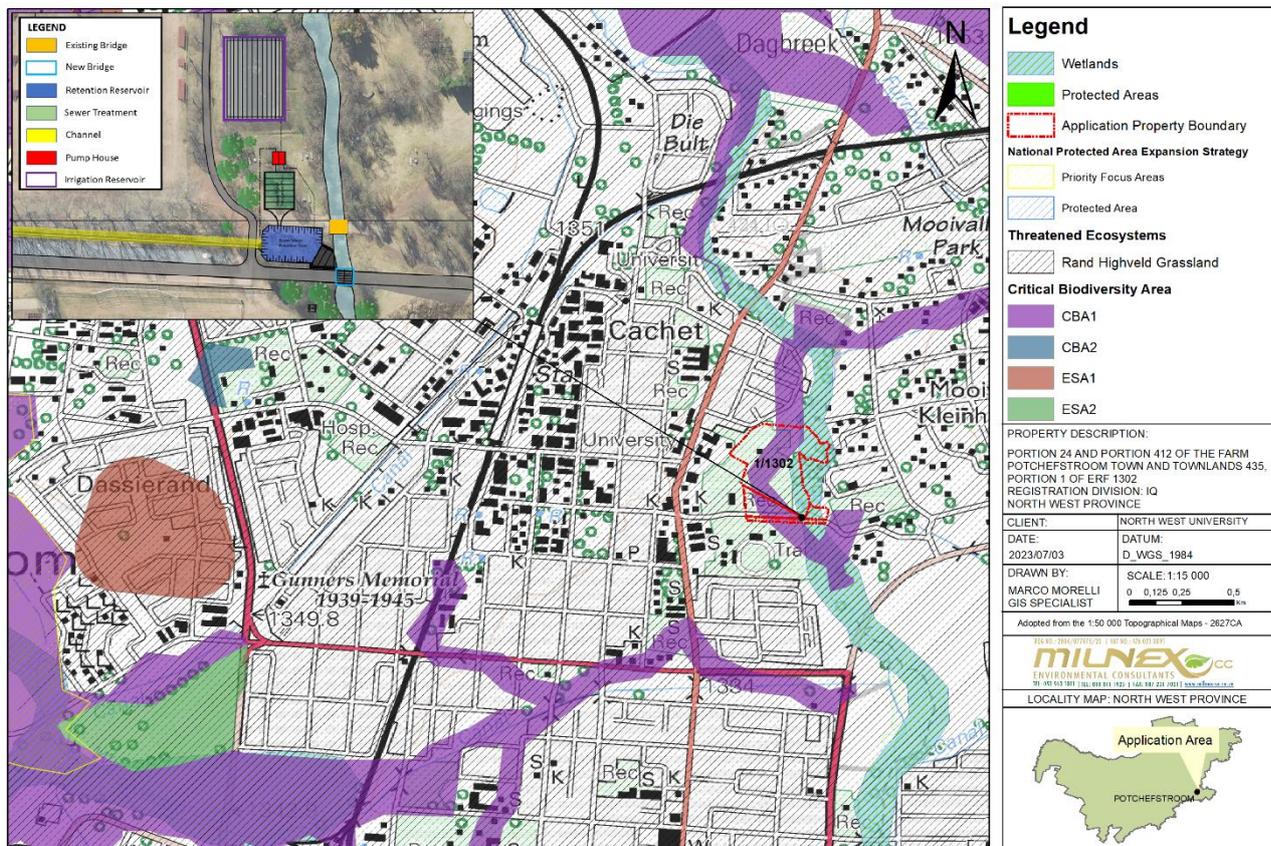
- Ensure that the activity does not cause pollution to the environment or harm to persons.
- Minimise production of waste.
- All activities must be conducted in a manner that minimises noise impact, litter, environmental degradation and health hazards i.e. injuries.

**N. FINAL PROPOSED ALTERNATIVES.**

**(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)**

The final proposed site is on Portion 24 and Portion 412 of the Farm Potchefstroom Town and Townlands 435 and Portion 1 of Erf 1302, Registration Division: IQ; North West Province.

**SUPERIMPOSED SENSITIVITY MAP**



**Figure 25:** Superimposed sensitivity map

O. DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE.

(Which relate to the assessment and mitigation measures proposed)

All the data and information supplied to Milnex Management Services (Pty) Ltd is assumed to be accurate and reflective of the current condition of the affected area. It is assumed that the baseline information scrutinised and used to explain the environmental profile is accurate.

The applicant (**North West University**) will comply with all legislation pertaining to the activities applied for and that all permits and licenses that may be required will be identified and applied for prior to commencement of construction activities.

The Stakeholder Engagement Process is deemed sufficiently effective in identifying the critical issues needing to be addressed in the BAR/EMPr by the Environmental Assessment Practitioner (EAP). The Stakeholder Engagement Process has sought to involve key stakeholders and individual landowners. Wherever possible the information requested and comments raised by Interested and Affected Parties (I&APs) has been sufficiently addressed and incorporated into the Basic Assessment Report for perusal and comment. A monitoring and evaluation system, including auditing, will be established and operationalized to track the implementation of the EMPr ensuring that management measures are effective to avoid, minimize and mitigate impacts and that corrective action is being undertaken to address shortcomings and/or non-conformances.

It is assumed that all comments and concerns received by I&APs have been informed and considered. All key issues pertaining to the project have been assessed in this draft Basic Assessment Report. Additional issues raised during the review of the BAR by stakeholders will be addressed and included within the Basic Assessment Report prior to submission to DEDECT for approval.

**North West University** will adopt a process of continual improvement when managing and mitigating negative environmental impacts arising from the project. The EMPr will be used as the basis of environmental management and will regularly be improved and refined where applicable.

P. REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

**Reasons why the activity should be authorized or not.**

It is the opinion of the EAP that the activity may be authorised.

The applicant opted for this site as is the most economically feasible. There are already existing activities which were undertaken in the past. The option will assist the University in managing their stormwater, grey water, usage of water for purpose of irrigation.

The option of not approving the activities will result in a significant loss to province income. And all economic benefits will be lost.

#### Q. CONDITIONS THAT MUST BE INCLUDED IN THE AUTHORISATION

- A copy of the EMP should be made available onsite at all times.
- Implementation of the proposed mitigation measures set out in the EMPr.
- The EMPr should be binding on all managers and contractors operating/utilizing the site.

#### **Period for which the Environmental Authorisation is required.**

Lifetime of the project

#### R. UNDERTAKING

**Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.**

The undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Environmental Impact Assessment report and the Environmental Management Programme report.

I, Ms. Percy Schaole Reg. EAP (EAPASA) Pr. Sci. Nat. herewith confirms

- i.** the correctness of the information provided in the reports
- ii.** the inclusion of comments and inputs from stakeholders and I&APs ;
- iii.** the inclusion of inputs and recommendations from the specialist reports where relevant;
- iv.** the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed;

*P. Schaole.*

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Signature of the environmental assessment practitioner:

Milnex Management Services (Pty) Ltd

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Name of company:

04/07/2023

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Date:

## S. FINANCIAL PROVISION

**State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.**

Not applicable

### i) Explain how the aforesaid amount was derived.

Not applicable

### ii) Confirm that this amount can be provided for from operating expenditure. (Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

Not applicable

## T. OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

- A detailed layout plan of the proposed development with buffer zones

## U. OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT.

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist.

Section 24(4)(A) and (B) was taken into consideration by investigating potential consequences or impacts, investigating mitigation measures, investigating, assessing and evaluating impacts.