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REC SERVICES
ENVIRONMENTAL CONSULTANTS

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PROCESS

PROPOSED FARMING ACTIVITIES FOR CROP PRODUCTION AND ASSOCIATED INFRASTRUCTURE SUCH AS A WORKSHOP AND CROP PRODUCTION TUNNELS ON THE REM. OF POR. 2 OF THE FARM UITMALKAAR 126IR, MPUMALANGA.

Reference No.: **1/3/1/16/1 G-263**
NEAS No.: MPP/EIA/0001095/2022

Draft ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Prepared for:
MR B. MODUKA
MPUMALANGA PROVINCIAL HERITAGE RESOURCES AUTHORITY
1ST & 2ND FLOOR, BUILDING 5
GOVERNMENT COMPLEX
7 GOVERNMENT BOULEVARD
RIVERSIDE PARK
NELSPRUIT
1200

On behalf of:
NOMVULA MPUMELELO (PTY) LTD.
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REC SERVICES (PTY) LTD

Date: **30 November 2022**

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1. EXECUTIVE SUMMARY

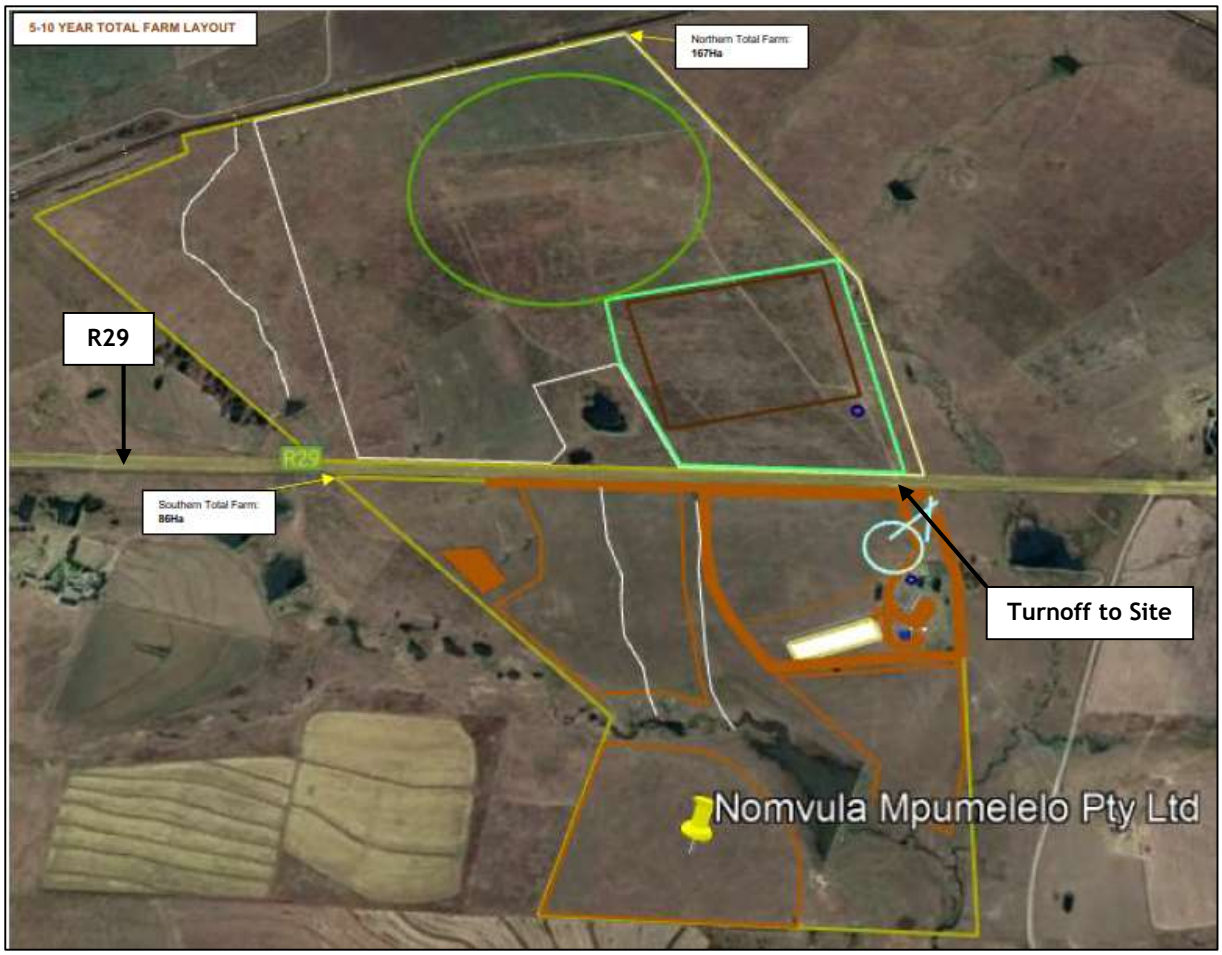
REC Services (Pty) Ltd. (REC) was appointed by Mr. Ewert Snyman of Nomvula Mpumelelo (Pty) Ltd., for the Environmental Impact Assessment and application process in terms of the National Environmental Management Act (Act 107 of 1998), pertaining to proposed establishment of new land for crop production and some associated infrastructure such as a workshop and crop production tunnels.

1.1 BASIC PROJECT DESCRIPTION

Application for the establishment of a new pasture, crop production tunnels, and vegetable production fields and associated infrastructure as part of the overall farming enterprise. Approximately 176 Ha will be developed for this vegetable production and pasture fields.

1.2 LOCALITY AND STUDY AREA

The proposed establishment of new land for crop production and some associated infrastructure such as a workshop and crop production tunnels, on the Rem. of Por. 2 OF the farm Uitmalkaar 126IR, Mpumalanga Province. The turn-off to the farm, from the R29, is about 7.2km from the R29 and R547 interchange at Kinross. GPS coordinates of site: -26.383846°, 29.022789°.



The proposed sites are all situated in a grassland biome affected by agricultural practices ranging from crop production, planted pastures, sheep and cattle farming to game farming. Small streams and rivers crisscross the area with an occasional earth dam in it.

1.3 ASSESSMENT AND CONSIDERING ALTERNATIVE ROUTES

Right from the onset of the EIA process close examination was given to different alternative agricultural practices. Nomvula Mpumelelo (Pty) Ltd. has already invested in a livestock (grazing) for this property. To make this site more productive and profitable the applicant now wants to invest into new areas to produce more product on a commercial scale for the community and its livestock.

In this case, very little option is available to alternative sites/properties for most of the property of the applicant has already been earmarked for specific future agricultural practices. All the water needs for this agricultural venture will be extracted from the site itself.

The design and technology alternatives are also very limited due to the fact that the majority of the site will be used for the intended agricultural practices. Planted pastures and cropland is very straight forward in its design and techniques used. There is only one way to plough a field and erect an irrigation system on it. The same goes for the crop production tunnels.

The only alternative to the planted pastures, cropland and irrigation field would be a different agricultural activity.

1.3.1 Activity Alternative

Cattle feedlot or a piggery.

1.3.2 No Go Option

A "DO NOTHING" alternative would be not to build this proposed development and keep all the current properties as it is. This could mean that there will be no additional crops and animal feed being produced and that job creation is not promoted, but it could also mean that the natural grassland ecosystem is not impacted upon by additional agricultural activities.

1.4 PUBLIC PARTICIPATION PROCESS

The Public Participation Process was conducted on 6 July 2022. It is still on-going.

- Background Information Documents (BIDs) were distributed/emailed to adjacent landowners as well as other Interested and Affected Parties (I&APs) on the 6th and 7th of July 2022 (please refer to Appendix 5A for a copy of the BID as well as proof of the distribution of the BIDs).
- A site notice was erected/placed on site on the 6th of July 2022 next to the sites' access road (please refer to Appendix 3D for a copy of the Site Notice as well as proof of the erection of the Site Notices):

- A press advert was placed in the 'Ridge Times' newspaper on the 8th of July 2022.
- The ward councillor (Ward 2), local and district municipality, DWS, and the provincial heritage resources agency was informed by means of Background Information Documents (written notifications) via email.

1.5 THE EIA PROCESS

During the course of this EIA assignment the following actions and steps are required and was/will be followed in accordance with the Regulations, as amended, set out in Government Notice No. 326 of 7 April 2017 of the NEMA, as amended:

- An Application for Authorisation, signed by the Applicant, together with a Declaration of Independence, which was signed by the environmental assessment practitioner, was submitted to the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA). This coincided with the submission of the draft Scoping Report.
- The Public Participation Process did/will inform the public about the proposed development and application process and input, comments and suggestions were/will be requested.
- The draft Scoping Report was made available for comments to the DARDLEA, registered I&APs, the local authorities and all other applicable stakeholders. The draft Scoping Report was also available to be viewed at the Secunda Library.
- The final Scoping Report was submitted to DARDLEA for review.

- DARDLEA accepted the final Scoping Report, and an Environmental Impact Assessment Report with an attached Environmental Management Programme will now be compiled and completed. All issues from the Scoping Report were addressed in the draft and final EIA Report, as well as issues and impacts identified by the Environmental Assessment Practitioner. Any relevant specialist studies are included in the draft and final EIA Report. The issues identified in the specialist studies will also be addressed in the final EIA Report.

The draft EIA with attached Environmental Management Program (EMPr) report was made available for comments to the registered I&AP's. Comments received from I&AP's on the contents of the draft EIA and EMPr report were incorporated into the final EIA and EMPr reports. By making the draft report available, ensures that all issues have been identified.

1.6 CONCLUSION

The purpose of this Environmental Impact Report (EIR) has been:

- To provide a project description, and an overview of the proposed development activities on site.
- To provide a description of all the important environmental elements of the study terrain.
- To provide descriptions of all anticipated/identified biophysical and social-economic issues and impacts that could potentially occur as a result of the proposed development.

In summary it can be concluded that different parts of the proposed development will experience different effects or impacts on the environment. These are:

Environmental components to be affected negatively	Description of the anticipated environmental & socio-economic impacts / key issues
Properties (Farms)	• Noise and safety impacts, as well as loss of natural grassland.
Access to farms.	• Accesses have to be made safer by creating safer access roads and larger gates for farming

	equipment.
Noise Impact	• Very little noise will be created from farming equipment during planting and harvesting seasons.
Business/Agricultural areas	• Possible increase of income due to more production areas being created.
Water provision	• An increase in water demands due to the proposed development being very water intensive.
Land-use	• An increase of future agricultural production areas, although the loss of natural grassland and impacts on adjacent wetlands/rivers.
Environmental Sensitive Areas	• Loss of natural vegetation, wetland and impacts upon streams and drainage lines due to the proposed development, although the loss of habitat, proportionally to the wider region of similar natural vegetation, will be small to moderate.

The second phase of the Environmental Impact Assessment (EIA) process for the proposed development will be in the form of an **EIR**. Anticipated and potential significant impacts that have been identified relating to the development will be evaluated in terms of their significance.

The essence of any EIA process is aimed at ensuring informed decision-making and environmental accountability, as well as to assist in achieving environmentally sound and sustainable development. This is achieved by conducting an analysis of the potential impacts that a proposed development may have on the physical, environmental, and social aspects of the concerned area (as has been conducted during this environmental scoping process). In order to minimise the potential impacts associated with the proposed development, an Environmental Management Programme (EMPr) is to be compiled, which must be implemented in order to sufficiently mitigate the anticipated impacts to an acceptable level.

The draft environmental Scoping Report gave an account of the environmental qualities and attributes of the study area and described the details of the proposed development

in terms of the anticipated impacts/issues or interaction that the development may have with the different environmental components. The response to issues raised by members of the public is made available for comments for a period of thirty days. **After the Scoping Report was submitted and accepted by the relevant authority, the draft EIA report was compiled with all issues raised and again be made available to members of the public to determine whether all matters have been covered and addressed to their satisfaction.**

The Environmental Assessment Practitioner (REC) is of the independent opinion that the EIA process will conclusively determine if there are any fatal environmental flaws associated with the proposed development that would constitute the refusal of Authorisation of the project – bearing in mind that approval must be subject to strict implementation and monitoring of the EMPr to be compiled and given that there should be room for improvement on the EMPr as the project progresses. It is trusted that this EIR gives a balanced view of the anticipated environmental impacts or issues associated with a proposed development of this nature.

1.7 ENVIRONMENTAL APPLICATION

Adherence to Regulatory Requirements, Regulation No R. 326 of 7 April 2017, Appendix 2, as amended, published in terms of the National Environmental Management Act, 1998 (Act 107 of 1998), as amended.

Contents of a Scoping Report <u>as stipulated</u> in R. 326, as amended (Appendix 2, Point 2)		**Covered in Scoping Report**
Appendix 2 Point 2	A Scoping Report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include:	
(a)	Details of:	Chapter 2

	the EAP who prepared the report; and the expertise of the EAP, including a curriculum vitae;	Appendix 6
(b)	The location of the activity, including: the 21-digit Surveyor General code of each cadastral land parcel; where available, the physical address and farm name; where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Chapter 5 Appendix 3
(c)	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is: a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Chapter 5 Appendix 3 Appendix 4a
(d)	A description of the scope of the proposed activity, including: all listed and specified activities triggered; a description of the activities to be undertaken, including associated structures and infrastructure;	Chapter 4 & 5
(e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to	Chapter 4

	be considered in the assessment process;	
(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Chapter 5
(h)	a full description of the process followed to reach the proposed preferred activity, site and location within the site, including: details of all the alternatives considered; details of the Public Participation Process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts: (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; the methodology used in determining and ranking the	Chapter 5 Chapter 6 Chapter 7, Appendix 5 a-h Chapter 8, Appendix 1 Chapter 9

	nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; the possible mitigation measures that could be applied and level of residual risk; the outcome of the site selection matrix; if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and a concluding statement indicating the preferred alternatives, including preferred location of the activity;	
(i)	A plan of study for undertaking the environmental impact assessment process to be undertaken, Including: a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity; a description of the aspects to be assessed as part of the environmental impact assessment process; aspects to be assessed by specialists; a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;	Appendix 1

	a description of the proposed method of assessing duration and significance; an indication of the stages at which the competent authority will be consulted; particulars of the Public Participation Process that will be conducted during the environmental impact assessment process; and a description of the tasks that will be undertaken as part of the environmental impact assessment process; identify suitable measures to avoid, reverse, mitigate or manage identified impacts; and to determine the extent of the residual risks that need to be managed and monitored.	
(j)	An undertaking under oath or affirmation by the EAP in relation to: the correctness of the information provided in the report; the inclusion of comments and inputs from stakeholders and interested and affected parties; and any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Chapter 10
(k)	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	Appendix 1

(l)	Where applicable, any specific information required by the competent authority; and	Noted
(m)	Any other matter required in terms of section 24(4) (a) and (b) of the Act.	Chapter 8

2. INTRODUCTION

The purpose of this EIR is to identify all possible issues and impacts from activities associated with the proposed establishment of new land for crop production and some associated infrastructure such as a workshop and crop production tunnels, on the Rem. of Por. 2 OF the farm Uitmalkaar 126IR, Mpumalanga Province broadly and collaboratively. The secondary aim of this project is to identify alternatives in terms of site, design, and layout of the proposed development.

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--
    a. nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
    b. degree to which these impacts-
        i. can be reversed;
        ii. may cause irreplaceable loss of resources, and
        iii. 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.

As part of the listed activities identified in the 2017 EIA regulations promulgated on the 7 April 2017, as amended, the planning, construction and operation of the proposed development and associated infrastructure represent the legal trigger for the Environmental Impact Assessment (EIA) process to be followed. The listed activities were identified in term of Sections 24 & 24D of the National Environmental Management Act (Act No. 107 of 1998) (NEMA), as amended. The applicable listed activities identified are:

- Listing Notice 2, R. 325 Activity number 15.

2.1 DETAILS OF THE EAP

The EAP appointed for this project is part of REC Services (Pty) Ltd. (REC).

REC Services (Pty) Ltd. 566 Rubenstein Drive, Moreleta Park 0044 P. O. Box 40541, Moreleta Park, 0044 Telephone: 012 997 4742 E-mail: info@recservices.co.za & rowan@recservices.co.za	REC SERVICES ENVIRONMENTAL CONSULTANTS
APPLICANT: Nomvula Mpumelelo (Pty) Ltd. **Mr Ewert Snyman** Portion 2 of the Farm Uitmalkaar No 126 Kinross 2270 Cell: 084 511 5811 E-Mail: e.snyman@makwenzeke.com	NOMVULA • MPUMELELO

REC specializes in Environmental Impact Assessments and Management during the planning and development stages of a range of development projects. REC is a streamlined firm with an integrated approach to environmental impact assessments, networking with expertise where necessary, while always keeping a holistic view on assignments.

Our 30-year experience is across a broad range of development projects and clients involved in assignments in the urban and rural environments. Our main client base includes road and transport authorities, private land developers, local authorities, farmers, industrial developers, and mining enterprises where we form part of the project team which usually consist of Civil Engineers, Land surveyors, Town and Regional Planners, Property Developers, and Architects etc. Our services include Basic Environmental Assessments, Environmental Scoping Reports, Environmental Impact Assessment Reports, Environmental Management Programmes, and Environmental Monitoring Reports.

As part of the team at REC Services (Pty) Ltd. is **Mr. Rowan van Tonder**. He is the principal author of this report and works under the supervision of Mr. Pieter van der Merwe. Rowan undertook his studies at the University of Limpopo and obtained a M.Sc. degree in Botany (focus on Conservation Management) in 2007. Before this, he obtained his BSc. (Hons.) degree in Physical Geography (focus on Environmental Management) at the University of Pretoria and B.Sc. in Environmental Science at the University of Pretoria. He has been part of REC Services (Pty) Ltd. for 15 years (for extended details, See Appendix 6 – EAP CV). SACNASP (Pri.Sci.Nat) Reg. No.: 119204. EAPASA Reg, No.: 2020/2579.

Mr. Pieter van der Merwe is the managing director for REC Services (Pty) Ltd. Pieter's responsibilities extends towards reviewing project reports, conducting liaison and participation exercises and using his experience to guide his project team. The coordination of projects and marketing of the company's services also falls within his responsibilities. Pieter obtained his qualifications at the University of Pretoria and includes a BSc. in Botany and Geology, a BSc. (Hons.) degree in Botany (UP) and a BA. (Hons.) degree in Environmental Management (UP for CHE). Pieter has over 30 years of experience in the Environmental Management field and has operated his own company, REC Services (Pty) Ltd, for more than 20 years.

2.2 EIA PROCESS FOLLOWED

This assessment will be undertaken in compliance with the National Environmental Management Act 107 of 1998 (NEMA), as amended, in accordance with stipulations made in Government Notice R. 326 of 7 April 2017, as amended.

The Environmental Impact Assessment process consists of two main components, namely (i) the technical/biophysical process and (ii) the public participation process.

(i) The technical process includes, but is not limited to, the following aspects:

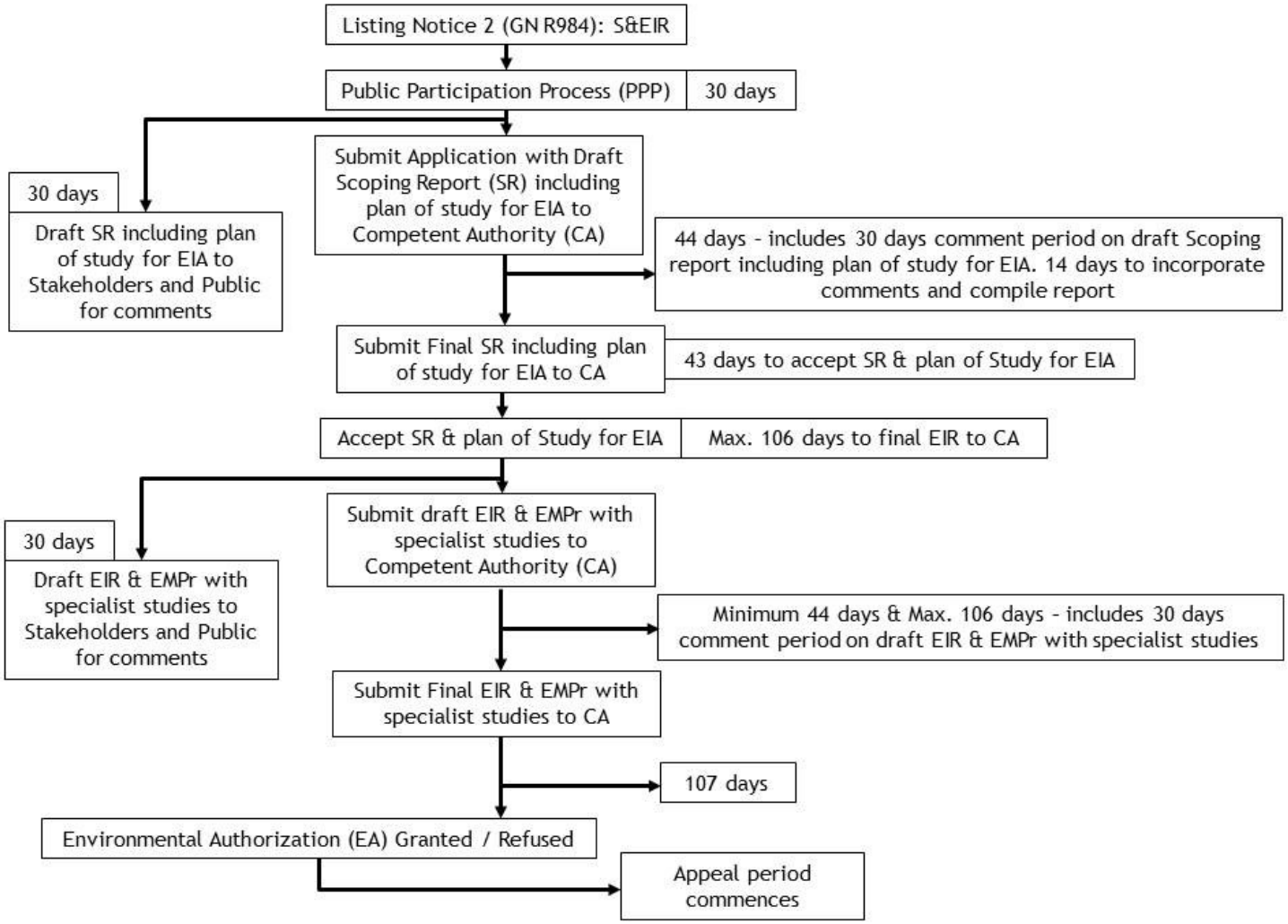
- Terrain investigations;
- Specialist Studies, including but not limited to:
  - An ecological study of the site, including functional biodiversity aspects on Threatened Ecosystems. A site rehabilitation plan to give effect to the recommendations of the biodiversity assessment in the report requested above, as the case may be;
  - The specialist studies must examine all cumulative impacts of the activity on the site and the surrounding environment;
- The identification and assessment of biophysical elements within the study area;
- Compilation of a Scoping and Environmental Impact Assessment Report with Environmental Management Program.

(ii) The public participation process includes:

- Compilation of a database of stakeholders and Interested and Affected Parties;
- Legal notices of the environmental process (press advertisement and on-site);
- Dissemination of information to stakeholders and I&APs;
- If needed, conduct an open day(s) or meetings, where Interested and Affected Parties can view the lay-out plan and be informed of the functioning of the treatment process in basic terms;
- Identification of environmental, as well as social issues and concerns, as raised by I&APs or other relevant stakeholders, and
- Addressing all concerns raised by I&APs.

The Public Participation Process is conducted in parallel with the total EIA process (technical/biophysical process). The Public Participation Process does not aim to promote agreement amongst I&APs or quell possible opposition against a project. The process is made open and transparent to all those involved. Additionally, it is considered important to involve I&APs as early in the EIA process as possible, to ensure informed decision-making and effective participation throughout the study.

The Environmental Impact Assessment Process contains the following steps (Gazette notice no. 38282):



2.2.1 Scoping Phase

During the course of this study the following actions and steps were followed which are in accordance with the Regulations set out in Government Notice No. 326 of 7 April 2017 of the NEMA, as amended:

- A screening terrain assessment of the physical, historical and biological environmental components of the site was undertaken in order to determine which areas would be most suitable for road widening (i.e., would cause the least impact on the environment).
- An assessment was made of the ecological characteristics of the area which could potentially be affected by the proposed development.

The Public Participation Process was conducted on 6 July 2022. It is still on-going.

- Background Information Documents (BIDs) were distributed/emailed to adjacent landowners as well as other Interested and Affected Parties (I&APs) on the 6th and 7th of July 2022 (please refer to Appendix 5A for a copy of the BID as well as proof of the distribution of the BIDs).
- Site notices were erected/placed at several key locations on the 6th of July 2022 (please refer to Appendix 3D for a copy of the Site Notice as well as proof of the erection of the Site Notices):

- A press advert was placed in the 'Ridge Times' newspaper on the 8th of July 2022.

- The ward councillor (Ward 2), local and district municipality, DWS, and the provincial heritage resources agency was informed by means of Background Information Documents (written notifications) via email.

During the course of this EIA assignment the following actions and steps are required and will be followed in accordance with the Regulations, as amended, set out in Government Notice No. 326 of 7 April 2017 of the NEMA, as amended:

- An Application for Authorisation, signed by the Applicant, together with a Declaration of Independence, which was signed by the environmental assessment practitioner, will be submitted to the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA). This will coincide with the submission of the draft Scoping Report.
- The Public Participation Process will inform the public about the proposed development and application process and input, comments and suggestions will be requested.
- The draft Scoping Report will be made available for comments to the DARDLEA, registered I&APs, the local authorities and all other applicable stakeholders. The draft Scoping Report will also be available to be viewed at the Amersfoort Library.
- The final Scoping Report will be submitted to DARDLEA for review.
- Once DARDLEA accepts the final Scoping Report, an Environmental Impact Assessment Report with an attached Environmental Management Programme will be compiled and completed. All issues from the Scoping Report will be addressed in the draft and final EIA Report, as well as issues and impacts identified by the Environmental Assessment Practitioner. Any relevant specialist studies will be included in the draft and final EIA Report. The issues identified in the specialist studies will also be addressed in the final EIA Report.

2.2.2 EIA Report Phase

The draft EIA with attached EMPr report will be made available for comments to the registered I&AP's. Comments received from I&AP's on the contents of the draft EIA and EMPr report will be incorporated into the final EIA and EMPr reports. By making the draft report available, ensures that all issues have been identified.

The following specialist studies will be conducted with a set out terms of reference and included into the draft EIA report. This is due to key environmental issues identified during the scoping phase and Public Participation Process. The Province's Conservation Plan (C-Plan) (see Appendix 3 for the C-Plan map) also formed a basis and tool used on which the biodiversity assessment will be conducted:

- **Terrestrial biodiversity and Plant species Assessment:** A description of the vegetation of the study area, as well as the fauna, including the identification and assessment of potential Red Data species compiled by KEMS (Flora & fauna Specialist).
- **Heritage Impact Assessment Report:** A description of the cultural and heritage elements in and around the study site compiled by Leonie Marais-Botes (Heritage Practitioner), part of KEMS.
- **Wetland delineation, EIS PES and risk assessment**, compiled by Dr. Steve Mitchell (Wetland Specialist), part of KEMS.
- **Geohydrological Study**, yield testing (x1) according to the SANS standards and identification of bore hole target areas. (Geophysical survey), by AQUANZI

3. LEGISLATIVE FRAMEWORK

The following section includes a description of the policy and legislative context within which the development is proposed. The activity is taking place in the Gert Sibande District Municipality jurisdiction and in the Govan Mbeki Local Municipality Local authority in whose jurisdiction the site falls.

3.1 NATIONAL ENVIRONMENTAL MANAGEMENT ACT 108 OF 1998 AS AMENDED

NEMA was promulgated on the 27th of November 1998. The intention of NEMA is to provide for:

- Co-operative environmental governance by establishing principles for decision-making on matters affecting the environment;
- Institutions that will promote co-operative governance; and
- Procedures for coordinating environmental functions exercised by Organs of State;
- The prohibition, restriction or control of activities which are likely to have a detrimental effect on the environment.

Section 28(1) of NEMA states: "every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring". If such degradation/pollution cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution. Afrikan Farms as the custodians of this development, along with the appointed specialists therefore have a responsibility, to ensure that the EIA process conform to the principles of NEMA, and that the objective of the EIA process is to identify and assess environmental impacts and to manage these impacts. The final objective is to ensure that this proposed development remains environmentally sustainable.

Listed activities triggered in the 2014 NEMA regulations, as amended:

R. 325, 7 April 2017 – Listing Notice 2: Full EIA Activities	
Activity No	**Listed Activity Description:**

15	The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.

3.2 NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998)

The National Water Act, No. 36 of 1998 (NWA) was promulgated on 20 August 1998. The purpose of this Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed, and controlled.

In terms of Section 19 of the Act owners/ managers/ people occupying land on which any activity or process undertaken which causes or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing, or recurring.

This Act is relevant to the proposed project as both the construction and operational phases may impact negatively on water resources (for example, streams, rivers, wetlands, and groundwater resources).

The applicant is therefore required to take all reasonable measures to prevent any pollution to water resources as a result of the proposed project. Should any pollution occur, the applicant will be obliged to cease the activity that has caused the pollution and remediate any negative impacts resulting from the activity.

Notice was also given in terms Section 21 of the National Water Act, 1998 (Act 36 of 1998) with regards to the application for a Water Use License and/or Registration of the water use activities associated with the proposed development. This notice was included in the site notices, the press advertisement, and the Background Information Documents. The activities listed are:

Section 21-

- Section 21(a): taking water from a water resource.
- Section 21(b): storing water.
- Section 21(c): impeding or diverting the flow of water in a watercourse.

- Section 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource; and
- Section 21(i): altering the bed, banks course or characteristics of a watercourse.

3.3 NATIONAL HERITAGE RESOURCES ACT, 1999(ACT NO. 25 OF 1999)

The National Heritage Resources Act 25 of 1999 (NHRA) was promulgated in 1999 and aims to protect and manage the heritage resources of South Africa. The South African Heritage Resources Agency (SAHRA) is the enforcing authority of this Act and according to Section 38, a Heritage Impact Assessment (HIA) is required where certain activities are proposed.

The activities that apply to the proposed development include:

- Section 38 (1) (c): any development or other activity which will change the character of a site-
    - exceeding 5 000m^2 in extent;

3.4 NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 2004 (ACT NO. 39 OF 2004)

The National Environmental Management: Air Quality Act of 2004 was only fully implemented from 1 April 2010, replacing the Atmospheric Pollution Prevention Act No. 45 of 1965.

The Air Quality Management Act aims to:

- Shift focus to the receiving environment in order to protect and enhance the quality of air;
- Provide reasonable measures for preventing pollution and ecological degradation;
- Secure ecologically sustainable development while promoting justifiable economic and social development;
- Decentralize management by shifting responsibilities to provincial and local government;
- Provide baseline air quality characterization by identifying priority areas, pollutants and sources;
- Provide a range of emissions reduction measures through command and control measures as well as market incentives and disincentives;

- Standardize through routine monitoring, information management and reporting; and
- Promote public participation and access to information.

This act is relevant to the proposed project as the proposed development may result in higher or lower levels of air pollution (dust and vehicle emissions) in the area, through both the construction and operational phases.

3.5 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 2004 (ACT NO. 10 OF 2004), ABBREVIATED AS NEMBA.

The objective of the National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA), within the framework of NEMA, is to provide for:

- The management and conservation of biological diversity within South Africa;
- The use of indigenous biological resources in a sustainable manner; and
- The fair and equitable sharing among stakeholders of benefits arising from bioprospecting;

The South African National Biodiversity Institute (SANBI), which was established as a result of the NEMBA, and has the key responsibility of monitoring and reporting on the country's biodiversity and conservation status in terms of threatened and protected species or ecosystems.

SANBI undertook a detailed mapping of South Africa's biodiversity and publish a list of threatened eco-systems. From that a biodiversity conservation plan was created for the Mpumalanga Province. Presently, however, it is considered good practice to conduct Faunal and Floral Impact assessment studies where development projects are to be implemented in sensitive areas. The drainage courses (for example) to be affected by the project are indeed sensitive areas. Therefore, these studies will be conducted during the EIA process that will follow this scoping phase. If any negative impacts on biodiversity should be identified, Nomvula Mpumelelo (Pty) Ltd. will take all reasonable measures to limit the impacts.

4. PROJECT MOTIVATION & ALTERNATIVES

4.1 NEED AND DESIRABILITY

Please Appendix 7.

4.2 PROPERTIES AFFECTED

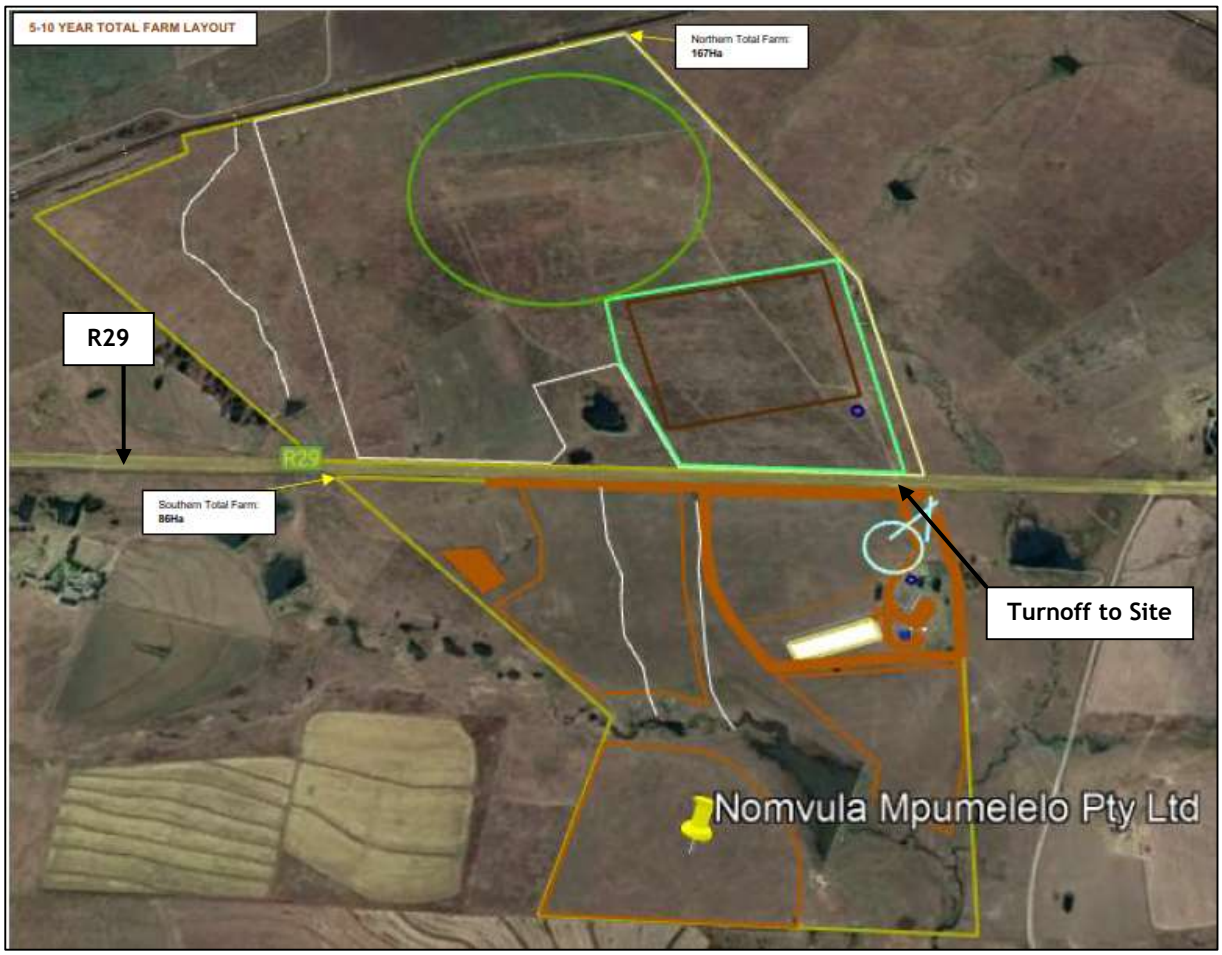
The following list of properties will be affected by the proposed development:

- T0IR00000000001260002: Rem. of Por. 2 OF the farm Uitmalkaar 126IR.

4.3 PROJECT DESCRIPTION

4.3.1 Locality and Study Area

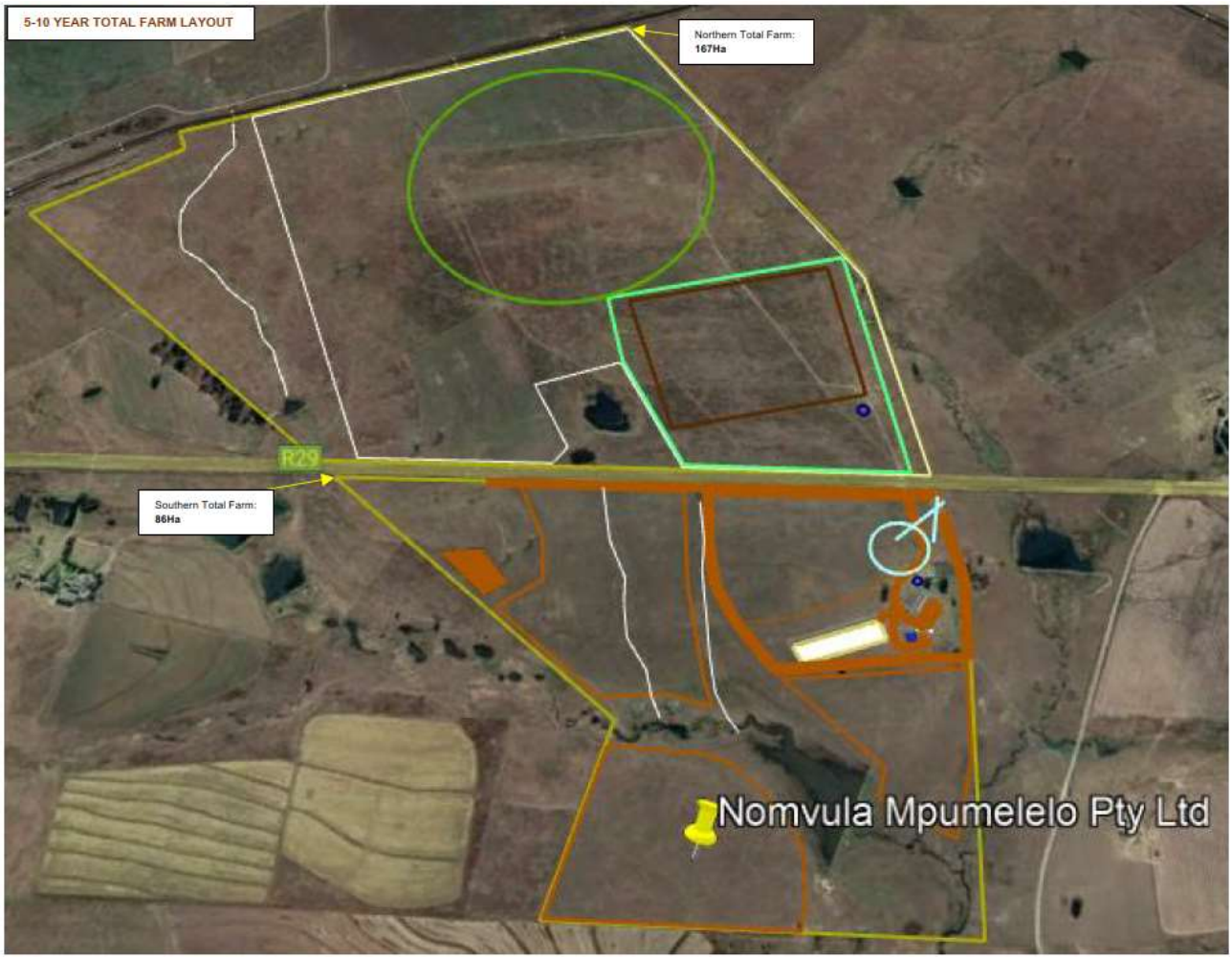
The proposed establishment of new land for crop production and some associated infrastructure such as a workshop and crop production tunnels, on the Rem. of Por. 2 OF the farm Uitmalkaar 126IR, Mpumalanga Province. The turn-off to the farm, from the R29, is about 7.2km from the R29 and R547 interchange at Kinross. GPS coordinates of site: -26.383846°, 29.022789°.

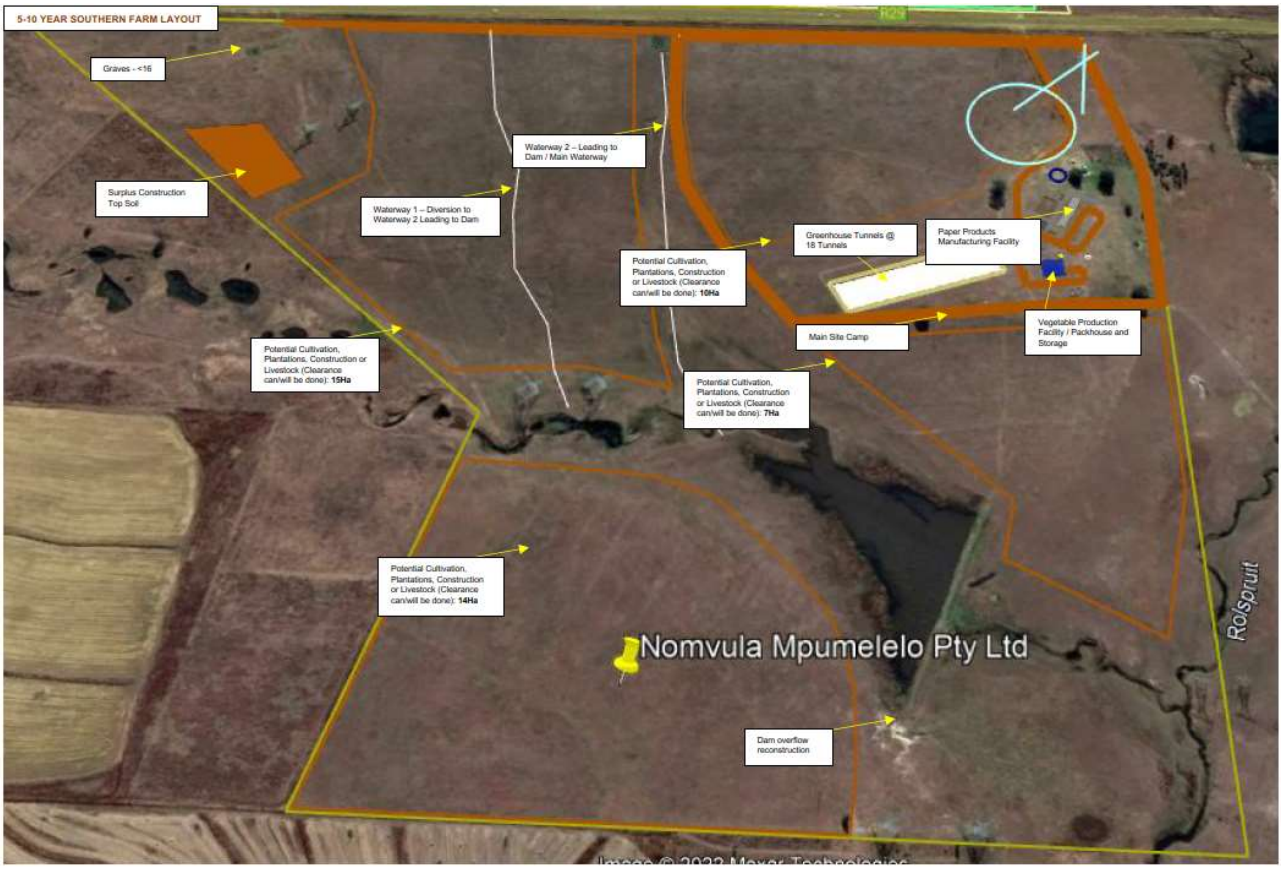


The proposed sites are all situated in a grassland biome affected by agricultural practices ranging from crop production, planted pastures, sheep and cattle farming to game farming. Small streams and rivers crisscross the area with an occasional earth dam in it. The attached locality map (Appendix 3) indicates its locality (also refer to the detailed map in Appendix 4A).

A broad study area was created around the crop production and some associated infrastructure such as a workshop and crop production tunnels (from here-on known as the 'development'). Although details of a proposed development will be accumulated and made available as the EIA process develops.

The future land use surrounding the development is predominantly agricultural, undeveloped, and undetermined in the Gert Sibande Regional Spatial Development Framework (RSDF).


5-10 YEAR TOTAL FARM LAYOUT
Northern Total Farm:
167Ha
R29
Southern Total Farm:
86Ha
Nomvula Mpumelelo Pty Ltd


5-10 YEAR SOUTHERN FARM LAYOUT
R29
Graves - <16
Surplus Construction Top Soil
Waterway 2 – Leading to Dam / Main Waterway
Waterway 1 – Diversion to Waterway 2 Leading to Dam
Potential Cultivation, Plantations, Construction or Livestock (Clearance can/will be done): 10Ha
Greenhouse Tunnels @ 18 Tunnels
Paper Products Manufacturing Facility
Vegetable Production Facility / Packhouse and Storage
Main Site Camp
Potential Cultivation, Plantations, Construction or Livestock (Clearance can/will be done): 15Ha
Potential Cultivation, Plantations, Construction or Livestock (Clearance can/will be done): 7Ha
Potential Cultivation, Plantations, Construction or Livestock (Clearance can/will be done): 14Ha
Nomvula Mpumelelo Pty Ltd
Dam overflow reconstruction
Ro/Sprut

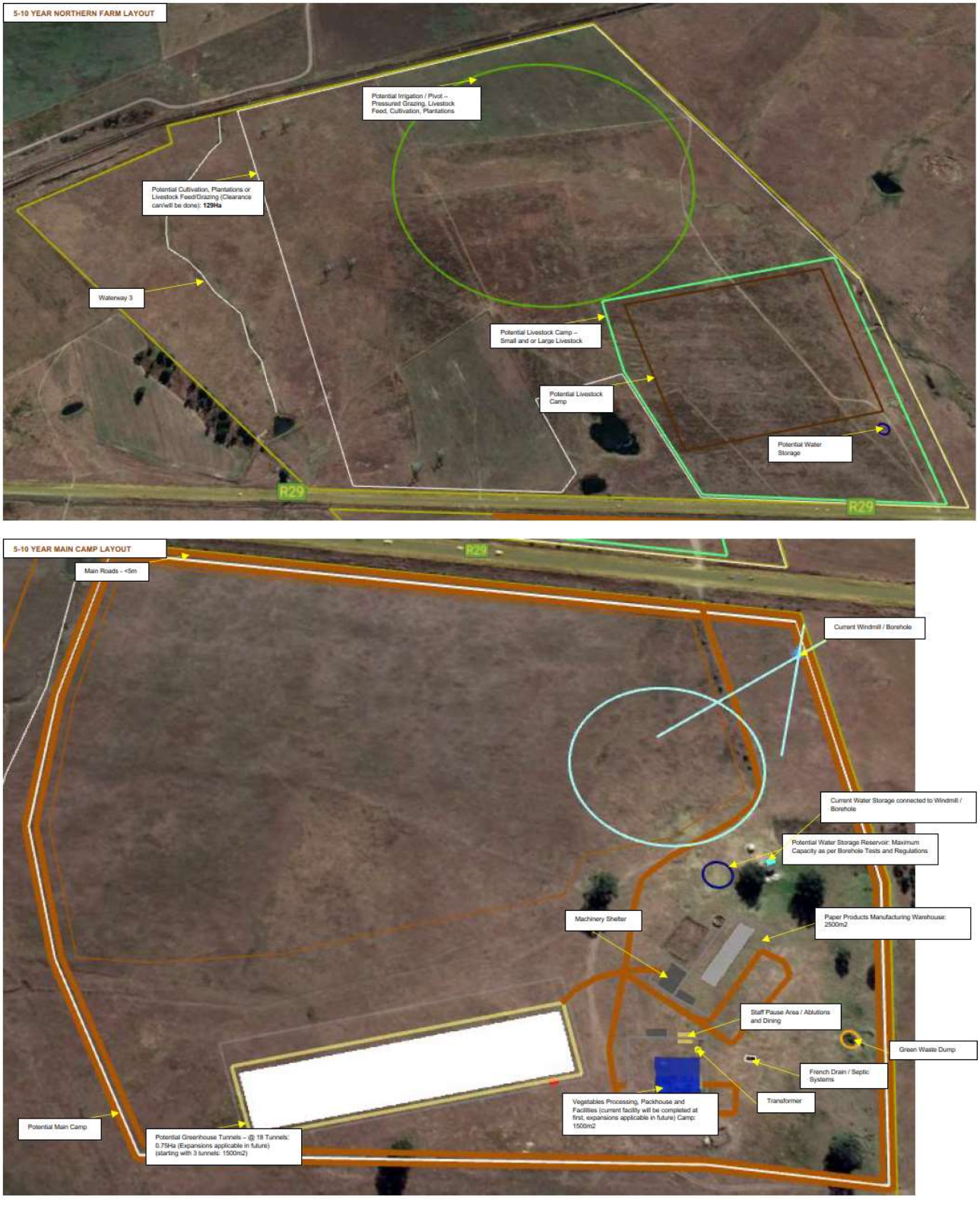


Figure 1: Overview of the study area.

Please see Appendix 4A for to focussed areas where the agricultural development will be implemented according to the vegetation report and arable land identified.

4.3.2 Preferred Alternative (Proposed development)

The preferred alternative for the development (Fig. 2) is discussed:

The 252 Ha site consist of disturbed grassland, drainage line, stream and earth dam. This area will be converted to 176 Ha of pastures (grazing land), irrigation pivot, livestock camp, cropland and production tunnels with associated infrastructure.

The northern section consists of 129 Ha and will have the irrigation pivot and livestock camp. The southern section consists of 46 Ha and will have the cropland/plantations, Greenhouse Tunnels, Vegetable production facility, and paper production manufacturing facility.

The site falls within the Rem. of Por. 2 OF the farm Uitmalkaar 126IR. The site has a steam/drainage line with and earth dam in the southern section and 2 small dams in its northern section. The R29 divides this farm portion, and a railway line borders the northern boundary of the farm portion.

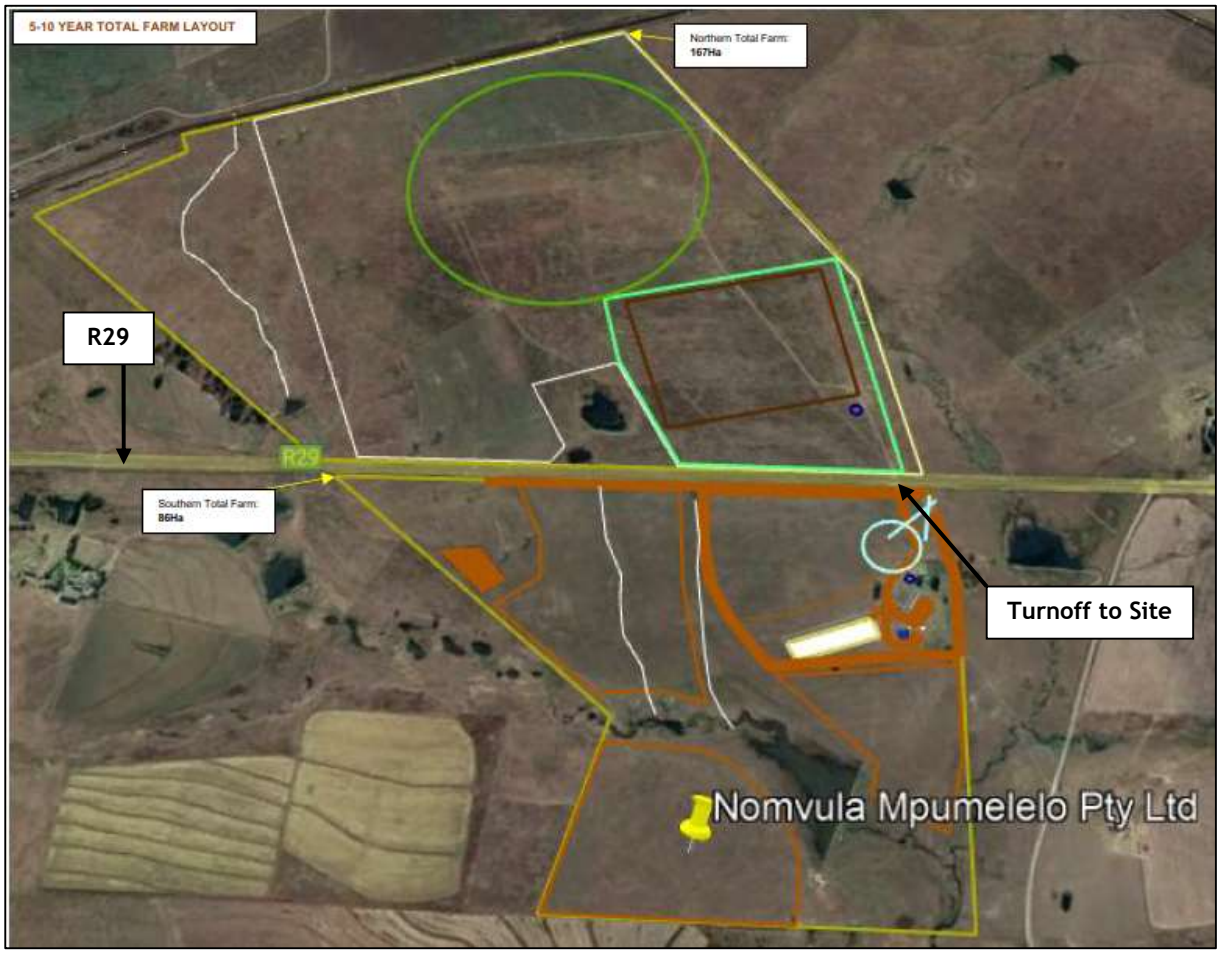


Figure 2: Preferred alternative of the proposed development.

Table 1 below provides a description based on land use and general environmental characteristics within which the project occurs.

Table 1: Affected Areas of the proposed development (Please refer to the layout plan attached).

Adjacent property land uses	Access	General comments	Key Environmental Issues
• Agricultural land portions. • Natural veld.	• Site access will be from the gravel road on its eastern boundary.	• The construction / development will be on disturbed grassland and agricultural land.	• Vegetation removal. • Possible habitat loss. • Air pollution due to exhaust fumes or dust (construction phase). • Noise pollution will be low. • Possible water pollution from runoff into river /wetland/ drainage line.

4.3.3 Assessment and Considering of Alternatives

Consideration of alternatives is one of the most critical elements of the environmental assessment process. It has its purpose to provide a framework for sound decision-making based on the principles of sustainable development. The search for alternatives should be well documented and should take into account the views of stakeholders. According to the Criteria for determining alternatives as part of the Integrated Environmental Management Information Series, the key criteria for determining alternatives should be practical, feasible, relevant, reasonable, and viable.

Right from the onset of the EIA process close examination was given to different alternatives. This was done in conjunction with the agricultural engineer as one has to acknowledge that not only environmental issues need to be considered but also to a large extent what will "work" from an engineering and agricultural design point of view. All the alternative options have various flaws in terms of economic, social, and environmental impacts.

One main activity alternative was looked at and taken into consideration. This alternative was assessed in terms of an environmental point of view as well as in a socio-economic point of view, as described below.

4.3.3.1 Activity Alternative

The only considered activity alternative would be a livestock production entity, like a piggery, poultry farm or a feedlot. Very little else can be considered at this stage due to the area being utilised by the proposed application and the best possible engineering option being used for this application. Just for information's sake, the application is already busy with a livestock option in another application process.

Positives	• A smaller area of grassland would be impacted upon in terms of footprint. • More animal products could be added to the mainstream of the area.
Negatives	• Less job opportunities will be available. • High pollution probability to the ground water could be expected. • No additional plant products could be added to the mainstream of the area.

4.3.3.2 No Go Option

A "DO NOTHING" alternative would be not to build/develop this proposed development and keep all the current land portions as it is. This means that no additional job opportunities will be created. Also, no additional increase of infrastructure and farm products will be created in this section of the Gert Sibande District Municipality. The grassland biome will not be disturbed further by agricultural practices.

5. BASELINE ENVIRONMENTAL DESCRIPTION

In order to determine the environmental impacts and to identify possible issues associated with the proposed development, it is necessary to provide baseline environmental information. Resulting from the site investigations and desk studies, as well as discussions with Interested and Affected Parties, the following section provides a description of the environmental conditions and important elements within the study area. Strong emphasis was placed on the ecological assessment of floristic and faunal elements and wetlands, within the area of proposed development. This is done so that sensitive elements that might adversely be affected by the proposed development could be highlighted. A general assessment, at this stage, of ecological elements does not require detailed floristic and faunal sampling for the draft environmental Scoping Report. All the detailed specialist studies will be (and is now) included in the draft EIA report.

5.1 LAND USE AND SOCIO-ECONOMICS

The study area is characterized by various land use entities. The proposed development falls within the Gert Sibande District Municipality (and in the Govan Mbeki Local Municipality) and involve one municipal ward area. The ward involved include Ward 2.

The agricultural land use is characterised by livestock and the production of various crops along the farmhouses and their infrastructure, and also large sections of open grassland and shallow valleys and hillside.

Land use will be impacted by the proposed development, especially with regards to the additional agricultural land and natural veld that will be covered by the proposed development.

Other socio-economic implications are:

- Job creation.
- Social upliftment.
- Increase in farm expertise (Know-how, skills development).

South Africa is much divided between a first and a second economy and this is also very

evident in the case of the Govan Mbeki Municipality. The second economy has become an umbrella term for the impoverished section of the South African population. Impoverishment and the need for job creation are also evident in Govan Mbeki Municipality and this is highlighted in the points below.

1. Govan Mbeki Municipality had a workforce of just over 150 000 people in 2001 as per the 2001 SA Household Statistics of which 27% were unemployed and 33% were not economically active (not economically active is sometimes a euphemism for the totally disenfranchised; people whom, if they had the right education, would have more than likely elected to seek some form of employment.) Hence 40% of the Govan Mbeki Municipality labour force has formal employment. This indicates that economic development and job creation is a key challenge for Govan Mbeki Municipality, much like the case in the rest of South Africa.
2. Of the total households, 41% of Govan Mbeki Municipality's population does not live in any "formal" homes, showing the extent to which economic development is still required. A review of the informal housing and unemployment statistics shows that 44% of the households lived on or below the poverty line in 2001, a situation that is likely to persist today. [Note: Although the 2001 statistics are out-dated, it is generally used until the update of the Household Survey by Stats SA]

This is very evident in Kinross. The socio-economic implications of this proposed development are the creation of more job opportunities and services in and around the town of Kinross, which is sorely lacking.

5.2 ENVIRONMENTAL DESCRIPTION

5.2.1 Regional climate

The study area is situated in pure grassland region, which is located in a more moderate temperature region typical of the Highveld at higher (1500 m.a.s.l.) altitudes.

5.2.2 Precipitation

The site falls within the summer rainfall area with dry winters. Mean Annual Precipitation (MAP) is between 801- 1000 mm. It is a cool-temperate climate with thermic continentality, which means high extremes between maximum summer and minimum winter temperatures with frequent occurrence of frost and large thermic diurnal

differences. Frost will start to occur between 11 – 20 April (Mucina and Rutherford, 2006).

From October to March the precipitation is at its highest, contributing to 83% of the MAP. The driest month is July & August, with less than 10 mm of rain. The greatest amount of precipitation occurs in January, with an average of 122 mm.

See Fig. 3, for the long-term MAP and temperature occurring in this area using the Agricultural Geo-Referenced Information System (AGIS).

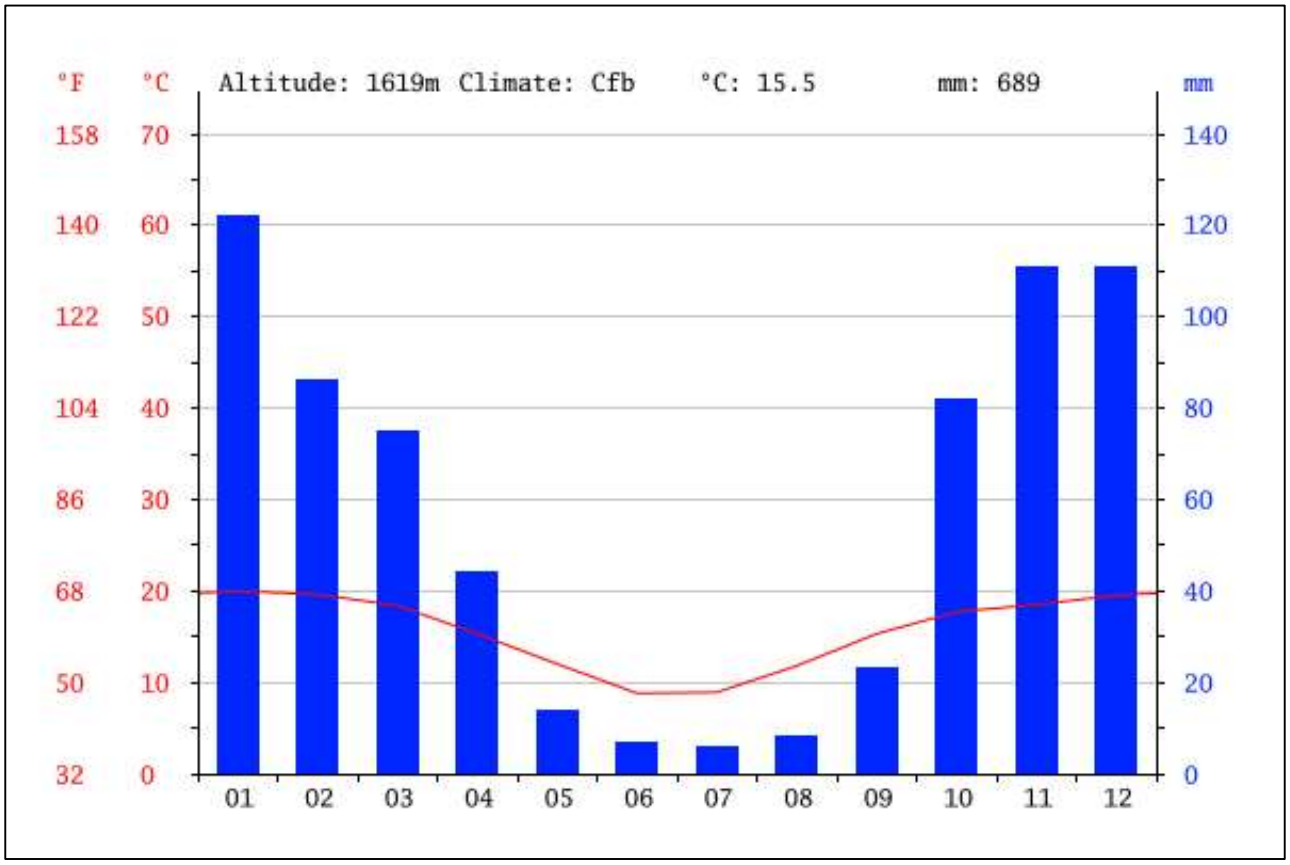
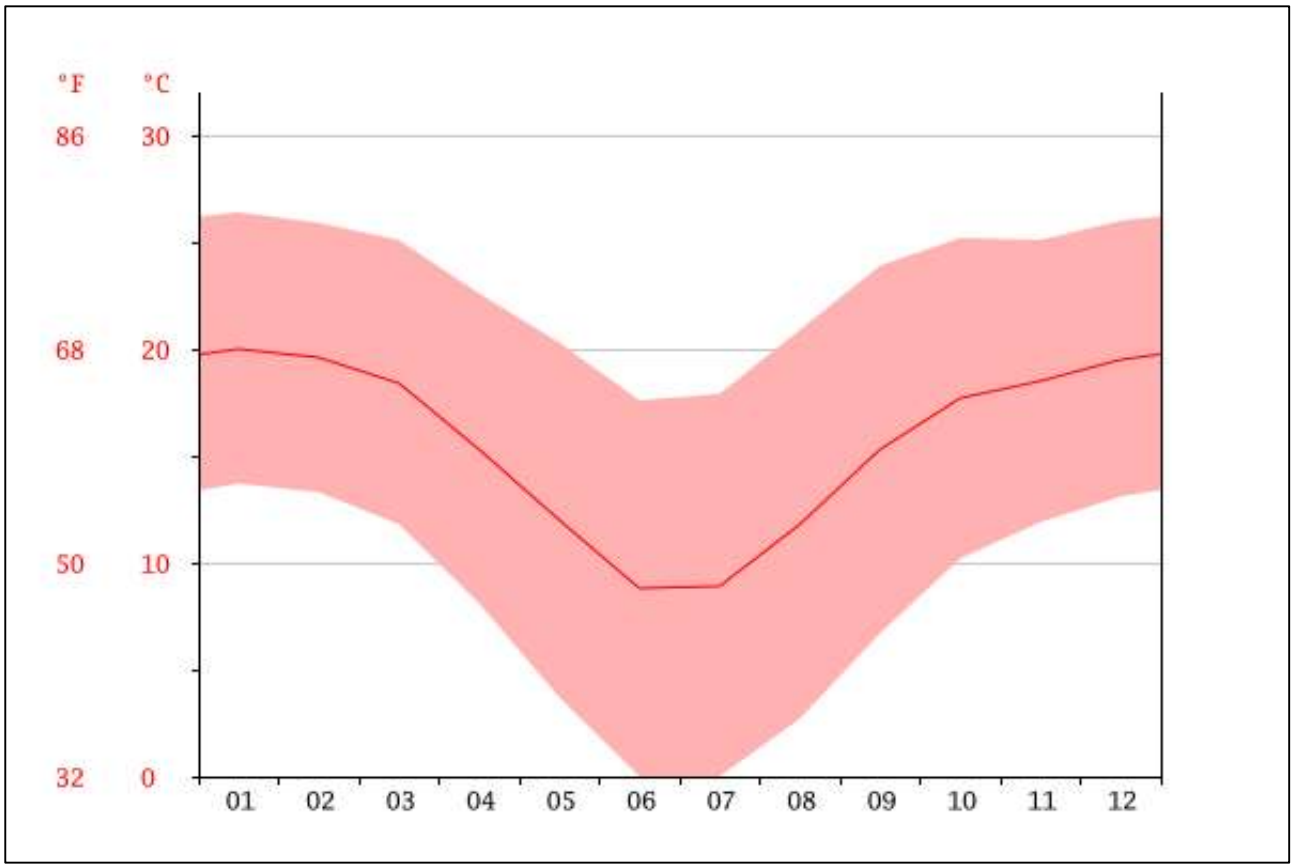


Figure 3: Average rainfall and temperature graph for the region weather station obtained by using the Agricultural Geo-Referenced Information System (AGIS, 2017).

5.2.3 Temperature

February is the warmest month of the year. The temperature in January averages 20.0 °C. The lowest average temperatures in the year occur in June, when it is around 8.8 °C. (See graphic illustration above for the long-term annual temperatures occurring in this area using the Agricultural Geo-referenced Information System (AGIS) (see Fig. 3, and below).



5.2.4 Frost

Frost occurs 21 days per year, varying greatly between 3 and 40 days.

5.2.5 Mean Monthly Wind Direction and Speed

No data is available on the average wind speed for the study area. Wind data was obtained for Emalahleni (Witbank) as variation in wind direction, occurrence and speed is expected to be very similar in the study area. The available wind data as obtained from the National Weather Bureau indicates that the average wind direction and speed are as graphically indicated below:

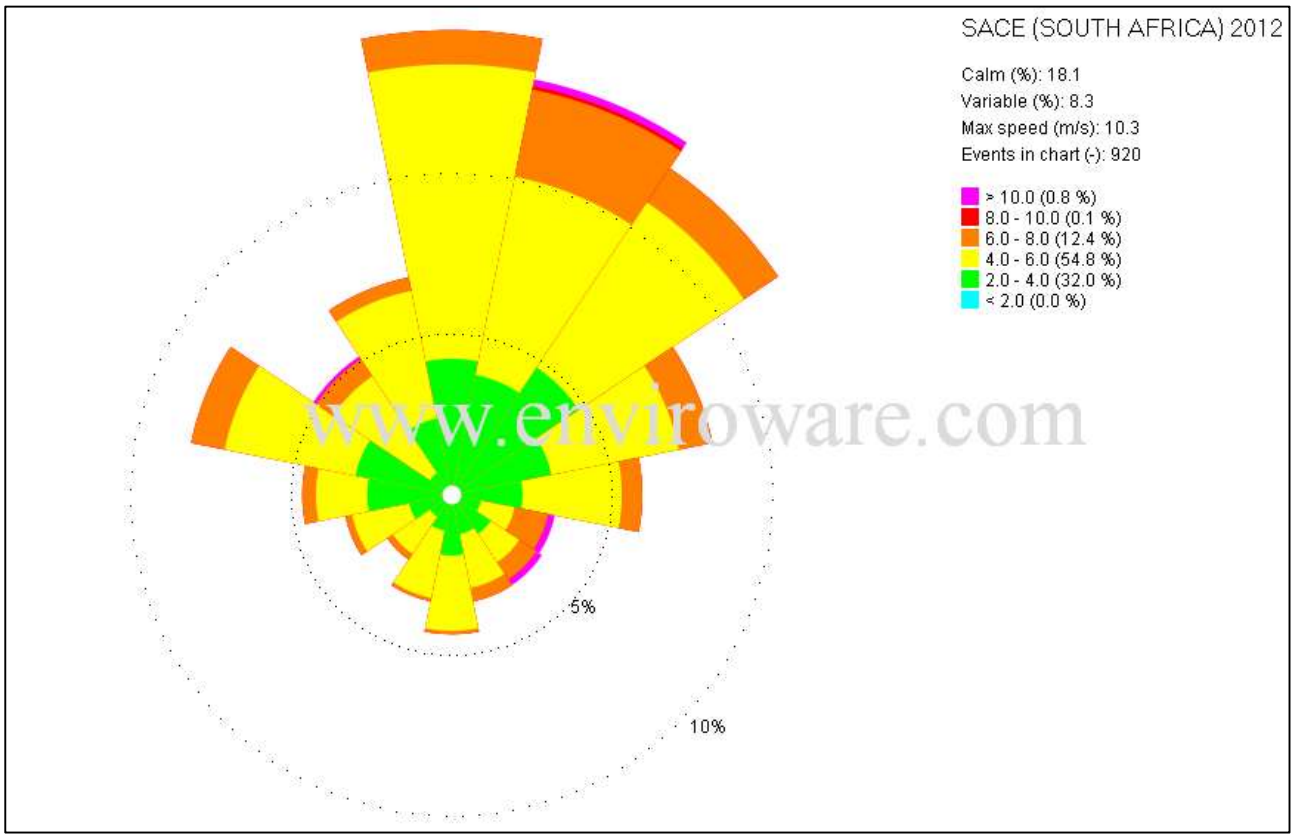


Figure 4: Prevailing wind of the wider region (Ermelo weather station).

The prevailing wind, on a regional basis, is predominantly north, north-northeast, and north-northeast. Wind speed, on a regional basis, in the region is relatively low with an average of 7 km per hour compared to stronger winds of an average of 12 km per hour.

The prevailing wind directions for summer and winter morning and afternoons are as follows:

Summer mornings:	East to northeast
Summer afternoons:	North to northeast
Winter mornings:	Southeast to northeast
Winter afternoons:	Northwest

5.2.6 Topography and Surface Drainage

The 'terrain type' of the area is classified as level plains to valleys with some relief. The terrain contains some distinct topographical sections, namely:

- Sensitive features include a stream/drainage line with small wetlands and a earth dam in the southern section of the site.

- 2 small dams found in the northern section of the site.
- The R29 divides the portion.
- Cropland/planted pastures south and west the proposed site.
- Grassland all around the site.

The area has a very gentle slope. The site falls within the Waterval (Kleinspruit) Quaternary catchment area (C12D catchment).

Wetlands occur around of the study areas which is often associated with small dams and streams and drainage ways (perennial and non-perennial). The potential impact of construction activities during the proposed development is identified as a high significant impact, which needs a detailed impact assessment and mitigation measures for these areas. However, it should be noted that aerial imagery clearly indicates that the wetland areas have historically been impacted on by agricultural activities. This is to be expected as the regional area focusses on agriculture and the impact (or lack thereof) will be confirmed during the Specialist Studies to be undertaken. Furthermore, as indicated by the South African National Biodiversity Institute (SANBI) the northern section of the study area has river unit (Type: 11_P_U), Rolspruit, in terms of Rivers National Freshwater Ecosystem Priority Areas (NFEPAs), as well as an artificial wetland (Type: Mesic Highveld Grassland Group 3_Seep) in terms of Wetlands National Freshwater Ecosystem Priority Areas (NFEPAs).

5.2.7 Agricultural Potential of the Study Area

The land potential, and specifically the agricultural potential of a site, is determined by the combination of climate, soil conditions and slope prevailing in that region or site, resulting in the classification of areas with similar agricultural land potential. These land potential classes range from "Very High Potential" to "Very Low Potential". The Department of Agriculture has mapped the agricultural potential of South Africa. Using this mapping files, (Agricultural Geo-Referenced Information System [AGIS]), the study area as well as surrounding the site, the agricultural potential is rated as **marginal** potential arable land.

The agricultural activities practiced in the study area are:

- Grazing or cattle and sheep; and

Large scale crop farming.

5.2.8 Flora of the Study Area

The study area is situated in the Soweto Highveld Grassland. This vegetation type is characterized by grassland dominated by *Andropogon appendiculatus, Cynodon dactylon, Eragrostis curvula* and *Themeda triandra*. The vegetation types on site are further categorized by low shrubs like *Anthospermum rigidum* subs. *pumilum*, *Berkheya annectens, Felicia muricata,* and *Ziziphus zayheriana*. In some places that are not disturbed, only scattered small wetlands, narrow streams alluvia, pans and occasional ridges or rocky outcrops interrupt the continuous grassland cover.

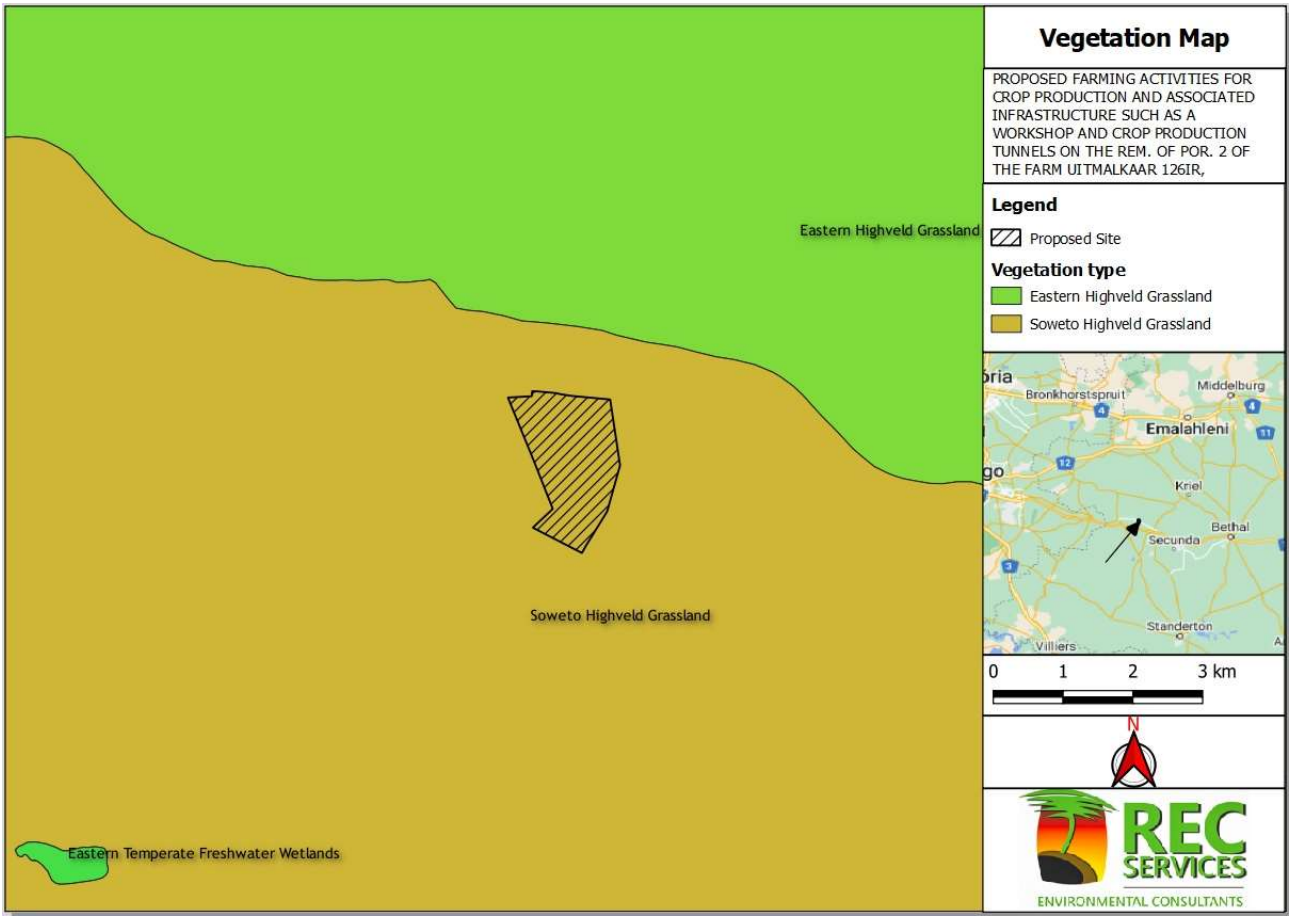


Figure 5: Vegetation type of the study area.

A Threatened species and Species of Conservation Concern list for the Grids 2629 AC was obtained from the Plants of South Africa (POSA) database on the South African National Biodiversity Institute (SANBI) website. Threatened species are those that are *facing high risk of extinction, indicated by the categories Critically Endangered, Endangered and Vulnerable*. Species of Conservation Concern include the Threatened Species, but additionally contain the categories Near Threatened, Data Deficient, Critically Rare, Rare and Declining. This is in accordance with the new Red List for South African Plants (Raimondo *et al*. 2009). However, the POSA list is based on herbarium specimens housed in the National Herbarium of SANBI; therefore, many plant species that do occur in the area are not listed.

The following possible red data plant species (by the categories Critically Endangered, Endangered and Vulnerable) could occur in the areas surrounding the study area:

- *Kniphofia typhoides Codd according to the POSA database for grid 2629 AC.*

5.2.9 Fauna of the Study Area

The study area is stretched over a large area. No Red Data Book Species were encountered.

5.2.9.1 Mammals of the study area

Possible smaller mammals that would commonly occur in the wider surrounding area are: *Rhabdomys pumilio* (Xeric Four-striped Grass Rat), *Myosorex varius* (Forest Shrew), and *Otomys auratus* (Southern African Vlei Rat). No Red Data Book species were recorded. There are also no records of red data (Critically Endangered, Endangered and Vulnerable) mammals for the wider area (2629AC).

5.2.9.2 Avifauna

According to available literature, approximately 211 bird species occur in the Kinross quarter degree grid cell (2629AC). No Red Data species were recorded on site. According to Taylor *et al*. (2014) and South African Bird Atlas Project 2, the following bird species are threatened in the wider area:

Table 2: List of possible red date (Critically Endangered, Endangered and Vulnerable) avifauna on or near the site.

SCIENTIFIC NAME	COMMON NAME	IMAGE
Mycteria ibis	Yellow-billed Stork	
Geronticus calvus	Southern Bald Ibis	
Phoenicopterus roseus	Greater Flamingo	
Phoeniconaias minor	Lesser Flamingo	
Sagittarius serpentarius	Secretarybird	

SCIENTIFIC NAME	COMMON NAME	IMAGE
Circus ranivorus	African Marsh-Harrier	
Circus macrourus	Pallid Harrier	
Circus maurus	Black Harrier	
Falco biarmicus	Lanner Falcon	
Falco naumanni	Lesser Kestrel	

SCIENTIFIC NAME	COMMON NAME	IMAGE
Glareola nordmanni	Black-winged Pratincole	
Hydroprogne caspia	Caspian Tern	
Spizocorys fringillaris	Botha's Lark	

5.2.9.3 Herpetofauna

No Red Data species was recorded. And no amphibians or reptiles were encountered on site. This might be due to the lack of suitable or specialised searching techniques that is required, as well as the history of anthropogenic activities on site.

Table 3: List of herpetofauna possibly on site or rather found in the wider area.

SCIENTIFIC NAME	COMMON NAME
Semnodactylus wealii	Rattling Frog
Amietophrynus gutturalis	Guttural Toad
Amietia fuscigula	Cape River Frog
Pseudocordylus melanotus Subs. melanotus	Common Crag Lizard
Leptotyphlops scutifrons Subs. conjunctus	Eastern Thread Snake

SCIENTIFIC NAME	COMMON NAME
Trachylepis punctatissima	Speckled Rock Skink

5.2.10 Elements of Culture Historical Importance

During the site investigations for the draft EIR stage, focus was also placed on the presence of any stone-built structure remnants, ruins, grave sites, monuments, complete built structures and the presence of artefacts. Based on preliminary observations, a grave site was found (see image below).

A phase 1 Heritage Impact Assessment, as part of the Environmental Impact Assessment stage of the application process, was conducted by a specialist in accordance with the National Heritage Resources Act (Act 25 of 1999).

The aim of the full HIA investigation will be to identify and assess, if any, heritage features and to recommend heritage management mitigation measures and monitoring programmes aimed at reducing the risks of adverse impacts. This input to be evaluated by Provincial Heritage Resources Authority (PHRA) will be included in the EIA stage to follow.

Findings from the HIA are:
SPECIFIC CATEGORIES INVESTIGATED AS PER SECTION 3 (1) AND (2) OF THE
NATIONAL HERITAGE RESOURCES ACT, 1999 (ACT NO. 25 OF 1999)

1. Does the site/s provide the context for a wider number of places, buildings, structures and equipment of cultural significance?

The study area does not provide context for a wider number of places, buildings, structures and equipment of cultural significance. The reason being the low density of heritage items in the study area.

2. Does the site/s contain places to which oral traditions are attached or which are associated with living heritage?

Places to which oral traditions are attached or associated with living heritage are usually found in conjunction with traditional settlements and villages which still practise age old traditions. None of these are evident near or on the proposed site.

3. Does the site/s contain historical settlements?

No historical settlements are located on or near the proposed site.

4. Does the site/s contain landscapes and natural features of cultural significance?

The site/s do not contain landscapes and natural features of cultural significance.

5. Does the site/s contain geological sites of cultural importance?

Geological sites of cultural importance include meteorite sites (Tswaing Crater and Vredefort Dome), fossil sites (Karoo and Krugersdorp area), important mountain ranges or ridges (Magaliesburg, Drakensberg etc.). The proposed site is not located in an area known for sites of this importance.

6. Does the site/s contain a wide range of archaeological sites?

The proposed site/s do not contain any surface archaeological deposits, a possible reason is previous agricultural and infrastructure development.

The possibility of sub-surface findings always exists and should be taken into consideration in the Environmental Management Programme.

If sub-surface archaeological material is discovered work must stop and a heritage practitioner preferably an archaeologist contacted to assess the find and make recommendations.

7. Does the site/s contain any marked graves and burial grounds?

The site does not contain marked graves or burial grounds.

The possibility of graves not visible to the human eye always exists and this should be taken into consideration in the Environmental Management Plan. It is important to note that all graves and cemeteries are of high significance and are protected by various laws. Legislation with regard to graves includes the National Heritage Resources Act (Act 25 of

1999) whenever graves are 60 years and older. Other legislation with regard to graves includes those when graves are exhumed and relocated, namely the Ordinance on Exhumations (no 12 of 1980) and the Human Tissues Act (Act 65 of 1983 as amended).

If sub-surface graves are discovered work should stop and a professional preferably an archaeologist contacted to assess the age of the grave/graves and to advice on the way forward.

8. Does the site/s contain aspects that relate to the history of slavery?

No evidence of the above evident on the site earmarked for development.

9. Can the place be considered as a place that is important to the community or in the pattern of South African history?

In primary and secondary sources, the proposed site is not described as important to the community or in the pattern of South African history.

10. Does the site/s embody the quality of a place possessing uncommon or rare endangered aspects of South Africa's natural and cultural heritage?

The proposed site does not possess uncommon, rare or endangered aspects of South Africa's natural and cultural heritage. These sites are usually regarded as Grade 1 or World Heritage Sites.

11. Does the site/s demonstrate the principal characteristics of South Africa's natural or cultural places?

The proposed site does not demonstrate the principal characteristics of South Africa's natural or cultural places. These characteristics are usually associated with aesthetic significance.

12. Does the site/s exhibit particular aesthetic characteristics valued by the community or cultural groups?

This part of the greater study area does not exhibit particular aesthetic characteristics

valued by the community or cultural groups. The reason being the low density of heritage buildings and structures located in the greater study area.

13. Does the site/s contain elements, which are important in demonstrating a high degree of creative technical achievement?

The site does not contain elements which are important in demonstrating a high degree of creative technical achievement. Reason being none of the above are evident on site.

14. Does the site/s have strong and special associations with particular communities and cultural groups for social, cultural and spiritual reasons?

The proposed site does not have a strong or special association with particular communities and cultural groups for social, cultural and spiritual reasons. No comment in this regard was received during the Public Participation Process (PPP).

15. Does the site/s have a strong and special association with the life or work of a person, group or organisation?

No indication of the above could be found in primary and secondary research sources.

5.2.11 Elements of Visual and Aesthetic Importance

Visual and aesthetic elements of importance have been considered with respect to the proposed development but will in general not be affected by the proposed activities of this development. This due to the fact that surrounding area is also visual disturbed by anthropogenic elements and is all part of a farming set up:

- Agricultural practices;
- Eskom powerline structures;
- Other roads, whether provincial or municipal; and
- Exotic and invasive plants seen on the fringes of the site.

5.2.12 Existing Services and Relocation thereof

No relocation of services at this stage were identified.

Site is in a rural area with no accessible municipal structures.

- **Electricity:** Supplied by Eskom from a 150-200 kVa transformer for the new land for crop production and some associated infrastructure such as a workshop and crop production tunnels.
- **Water supply:** Water for this application will be sourced out of boreholes. The volume of water needed for all this development will be:

NORTHERN PORTION (5-10 YEAR):

Usage:

- 7000 l/p/d - 217 000 l/p/m - 2 604 000 l/p/a

Storage:

- 50 000L (weekly use)

SOUTHERN PORTION (1-5 YEAR):

Usage:

- 15 000 l/p/d - 465 000 l/p/m - 5 580 000 l/p/a

Storage:

- 75 000L (weekly use)

SOUTHERN PORTION (>10 YEAR):

Usage:

- 58 000 l/p/d - 1 798 000 l/p/m - 21 576 000 l/p/a

Storage:

- 455 000L (total weekly use + reserve)

The Borehole Target (78) will be pursued at that stage of establishment of the Northern Portion. The average carrying capacity of the natural veldt in this vicinity is ±4 ha/LSU and ±2 ha/LSU on the permanent established pastures. With 25 ha established pastures

available a total of <46 LSU's will graze this land as per sustainable principles of cattle farming. Water consumption amounts to 7000 l/p/d which will be extracted from the borehole and stored within Water Storage Tanks with the capacity of 50 000L and water troughs will be filled by these tanks.

As per the Geophysical Survey (below), other borehole Targets (92,99,120) will also be pursued should additional water be required for 'possible' expansion of the Crops Cultivation operations conducted on the Southern Portion, which will result in the need for additional Water Storage. With this said, the water use limits will be honoured to ensure sustainability and compliance with the Water Use requirements, the overall possibilities for operations and also the scale of such operations will be limited to the water availability within the said area.

- **Sewage:** The only sewage will be from the current farmhouses. A septic tank system is used for this.
- **Domestic Waste Removal:** Waste is removed once a week by the applicant and burned on one of the farms that belong to the applicant. Approximately $5m^2$ of waste is produces in a week. Application: The National Environmental Management: Air Quality Act, 2004 (Act No. 39 Of 2004) RN 248 states that "Facilities with an incinerator capacity of 10 kg of waste processed per hour or larger capacity", requires an Air Emission Licence. Therefore, the sites capacity is under the threshold and will not require an Air emission Licence.
- **Access to the site:** The sites have access to the site from an existing road.

6. PUBLIC PARTICIPATION

6.1 INTRODUCTION

A Public Participation Process was conducted as part of the Environmental Scoping process. Stakeholders and I&AP's were given the opportunity to participate in this process and their comments, whether positive or negative, will have to be considered in the evaluation process by the Authorities.

The Public Participation Process aims to communicate to the public or community the potential positive and negative aspects that the proposed development will have on their immediate surroundings in an open and transparent way. The details of the project based on design elements available during the public participation exercise are communicated to the Interested and Affected Parties. The applicant is compelled, to mitigate, where possible, the impacts of the project. Mitigation measures should be implemented considering the practical and feasible means within the framework of the applicant's mandate. Suitable alternatives as identified during the process should also be considered.

6.2 OBJECTIVES OF THE PUBLIC PARTICIPATION PROCESS

The Public Participation Process has the following objectives:

- To inform Interested and Affected parties of the proposed development;
- Provide an opportunity for I&AP's to raise environmental issues/concerns;
- To promote transparency and an understanding of the project and its consequences;
- To serve as a structure for liaison and communication with I&AP's;
- To serve as a data gathering mechanism (of local knowledge);
- To identify issues that can easily be overlooked in the initial stages of planning.

To summarise, the objective of the on-going Public Participation Process is to promote openness and transparency concerning the proposed development, during the life span of the project planning and construction stages. The process should by no means be regarded as a vehicle to temper opposition or objections. Any conclusions agreed upon must be socially, financially, and technically acceptable and feasible in order to meet the requirements of both the NEMA and the vision and mandate or responsibility of the applicant, which is Nomvula Mpumelelo (Pty) Ltd.in this instance.

An important and further aim is to identify all I&AP's and remain in contact with them during the EIA process. The Public Participation Process does not terminate at the completion of the Scoping Report but proceeds up to the stage of submission of the draft and final EIA report.

6.3 THE GUIDELINES FOLLOWED FOR THE PUBLIC PARTICIPATION PROCESS

The Public Participation Process (PPP) for this project was conducted by REC, and undertaken strictly according to the Regulations, as amended, listed under Chapter 6 of NEMA, as amended.

6.4 PUBLIC PARTICIPATION PROCESS FOLLOWED

The following Public Participation Process was conducted for the proposed development (in summary):

- Identification of key Interested and Affected Parties.
- Compilation and distribution of the Background Information Document (BID) to adjacent property landowners. (Please refer to Appendixes for proof of the notifications or process followed for notifying I&AP's).
- Distributing the BIDs to the relevant Officials, such as the municipality and ward councillor.
- Compiling proof of delivery of the BIDs.
- Placement of a press notice informing the Public of the proposed development in a local newspaper.
- Placement of site notices.
- Receiving written comments from I&AP's to address in this Scoping Report.
- Correspondence with I&AP's and addressing I & AP's comments.
- Set up a register of I&APs.
- Compile a comments and response report.

6.4.1 Identification of key Interested and Affected Parties

I&AP's were identified progressively by means of a site visit and consultation with local residents and farmers who are familiar with the area and their neighbours. It is acknowledged that the list of registered I&AP's may be extended as the process proceeds

through the EIA process.

I&AP's, and the relevant Authorities were given 30 days to register in response to the Background Information Documents, the site notices and the press advertisement. A register of I&APs has been compiled which can be extended during the EIA process.

I&AP's, and the relevant Authorities, were given 30 days to comment on the Draft Scoping Report. All the comments, concerns and issues raised by the I&AP's and the Authorities will be considered during the next phase of the EIA process which is the EIA Report.

I&AP's, and the relevant Authorities, were given 30 days to comment on the Draft EIA Report. All the comments, concerns and issues raised by the I&AP's and the Authorities will be addressed in the Comments and Response Report.

6.4.2 Compilation and distribution of the Background Information Documents (BID)

The aim of a BID is to provide all I&AP's with a brief description of the proposed development. The BID also contains the details of the proponent and the environmental consultant. Furthermore, it serves as an overview of the Public Participation Process. The BID invited the I&AP's to submit comments and to register. A comment sheet was attached to the BID, which the I&AP's were asked to complete and return to REC if they had any suggestions or comments or issues regarding the project.

Please refer to Appendix 5A & 5B for copies of the BIDs and for the Acknowledgment of Receipt of the BIDs. Where the BIDs were emailed or faxed to I&AP's (as indicated on the Acknowledgement of Receipt pages), proof of such correspondence can be provided if required by any authority.

6.4.3 Placement of the press advertisement

Please refer to Appendix 5C for a copy of the press notice that appeared in a local (but far reaching) newspaper namely Ridge Times dated 8 July 2022. Press notices are crucial to create awareness of the project and to reach a broader range of interested and affected parties. Research and enquiries by the EAP indicated that the distribution area of this particular newspaper covers comprehensively the project area / study area.

6.4.4 Placement of on-site notice(s)

The proposed area for development is situated mostly in a rural and agricultural region. Therefore, to inform as broad a range of I&AP's as possible, several locations were strategically chosen to place the site notices at the entrance to the farms. The site notices also provided an opportunity to invite **any interested parties** to register. Please refer to Appendix 5D for copies of the site notice, as well as for the accompanying photographs that serve as proof of the placement of this at the study area.

6.4.5 Placement and Submission of the Draft EIR Report

The draft Scoping Report was submitted as follow and the EIR will be submitted to the same entities:

Submission date	Receipt date	I&AP or Stakeholder Name	Response in writing
25/11/22	28/11/22	Gert Sibande District: Environmental Impact Management	ASAP
25/11/22	28/11/22	Govan Mbeki local Municipality	ASAP
25/11/22	28/11/22	Govan Mbeki local Municipality: Ward Councillor 2	ASAP
25/11/22	28/11/22	Public view: Amersfoort Public Library	ASAP
25/11/22	28/11/22	MPHRA	ASAP
25/11/22	28/11/22	DARDLEA	ASAP
25/11/22	28/11/22	Department of Water Affairs and Sanitation	ASAP
25/11/22	28/11/22	Mpumalanga Tourism and Parks Agency (MTPA)	ASAP

6.4.6 Feedback from I&AP's throughout the EIA Process

The closing date for registration and comment delivery from I&AP's during the first public participation phase was within 30 days from the date of publication of the advertisements, which was the 8 August 2022, but public participation is still on-going. Comments were still accepted long after the date that was indicated in all notifications and REC will continue to do so throughout the duration of the project up to the submission of the final EIR. The challenge is to address comments, concerns and issues to the best practical means as most of the issues need special attention by the design engineers as well as all other parties that worked on the project.

The complete list of comments received from I&AP's can be viewed in **Appendix 5F.** The

questions and comments received to date are addressed in Annexure 5F. REC ensured that copies of the draft Scoping & EIR Report were available to all I&AP's and Authorities for more of their comments.

Notes were made of all the aspects and issues that were discussed during the public participation phase. All issues will be addressed and where technical matters arise it will be responded to by the engineers / specialist / applicant. All comments and responses can be viewed in the comments and response sheet. It was however firmly communicated that only written comments or issues (as per the registration sheet) could be place on record and responded upon.

A summary of the main comments and concerns received can be viewed below:

- No comments from the public were received to date.

6.5 ADDRESSING WRITTEN COMMENTS & QUESTIONS FROM THE I&AP'S

At this stage, comments have been received from the CA and MTPA. The conclusion is made, for the time being, that the project is received relatively positive by the community in general.

A summary of some the responses from the EAP are shown below (see **Appendix 5F** for the up-to-date Comments and Response Report):

Comments: None yet received.

Response: N/A.

6.6 CONCLUSIONS OF THE PUBLIC PARTICIPATION EXERCISE

The proposed development has generally been met with a positive attitude from the community at large. No issues have been identified by the I&APs for this project in the Draft Scoping & EIR stage (refer to Appendix 3F for all the issues raised).

The EIR will also aim to clarify, consider and sustainably mitigate remaining and significant concerns that the participating I&AP's might have. In conclusion, the public participation exercise has provided, up to this stage, adequate information to enable an understanding of what the proposed development would entail and to list and address the concerns and comments.

Through addressing all comments and questions received from the I&AP's, and through the compilation of a detailed Scoping Report and EIR to be made available for comments, the consultant has attempted to promote a better understanding of the activities of the proposed development. The knowledge and understanding of potential impacts identified at this stage of the application process has been improved.

7. ACTIVITIES, IDENTIFIED IMPACTS AND PRELIMINARY ASSESSMENT

7.1 INTRODUCTION AND METHODOLOGY

This section of the EIR provides a list of the biophysical and social issues that can be expected as a result of the proposed development. Some of the issues are localised in their effects, whilst others could influence a more extensive area. A major aim of the EIR is to identify issues and impacts.

The identification and brief descriptions of the relevant physical, biological, socio-economic and heritage issues were conducted under the following headings in Table 5:

- Environmental aspects: defined as those actions on site that may potentially have an environmental impact;
- Environmental component to be impacted upon;
- Locality / applicable zone of the impact; and
- Nature and description of the impact or issue

An impact significance rating and evaluation, for the listed aspects, forms part of the EIA process/report. Significant environmental issues have also been identified by means of the relevant environmental legislation, the opinions of specialist consultants and the views of interested and affected parties. Most of the identified and anticipated negative impacts listed below will only take effect once the construction of the proposed development commences; the main period of positive impact occurrence is during the long term "operational" phase of the development when it is felt that the broader community will benefit from the project in terms of produce and job opportunities. The long term negative operational impacts however will also be experienced by the close-by residence in terms of noise, habitat loss, possible groundwater reduction and pollution.

There are numerous assessment methodologies and approaches within the international sphere of assessing the potential impact of development activities on the environment.

When a particular method for environmental impact analysis is selected or used certain general principles must be kept in mind to avoid the mystique and pseudo-science, which cloud many planning procedures. In general terms an environmental assessment

evaluation comprises four main tasks:

1. Collection of data;
2. Analysis and interpretation of this data;
3. Identification of significant environmental impacts;
4. Communication of the findings.

Further to the above the proposed mitigation and management options for the identified impacts must be provided. The selected impact evaluation method must enable these four tasks. Impact methodologies provide an organised approach for predicting and assessing these impacts. Any one methodology and approach will have opportunities and constraints, as well as resource and skill demands, and no one method is appropriate for all South African circumstances. The selected methodologies proposed by this document are appropriate for most South African situations, taking the above criteria into account. Methods whose approach to considering environmental factors is systematic are desirable in an EIA.

Impact assessment methodology should comply with the following set of criteria:

a. *Be comprehensive:* The environment consists of intricate systems of biotic and abiotic factors, bound together by complex relationships. The methodology must consider the impact on these factors.
b. *Be flexible:* Flexibility must be contained in the methodology, as projects of different size and scale result in different types of impacts.
c. *Detect true impact:* The actual impact that institutes environmental change, as opposed to natural existing conditional changes. Long-term and short-term changes should be quantified.
d. *Be objective:* The methodology must be objective and unbiased, without interference from external decision-making.
e. *Ensure input of required expertise:* Sound, professional judgement must be assured by a methodology.
f. *Utilize the state of the art:* Draw upon the best available analytical techniques.
g. *Employ explicitly defined criteria:* Evaluation criteria used to assess the magnitude of environmental impacts should not be arbitrarily assigned. The methodology should provide explicitly defined criteria and explicitly

stated procedures regarding the use of these criteria, including the documented rational.

h. *Assess actual magnitude of impacts:* A method must be provided for an assessment based on specific levels of impact for each environmental concern.

i. *Provide for overall assessment of total impact:* Aggregation of multiple individual impacts is necessary to provide an evaluation of overall total environmental impact.

j. *Pinpoint critical impacts:* The methodology must identify and emphasize particularly hazardous impacts.

The evaluation of the severity (or significance) of the identified impacts has been done according to a set and objective Significance Rating Methodology, which uses both **quantitative** and **subjective** measures. The framework of this methodology is listed below, which fully explains the rating procedure used and how the construction and operation values given in Table 4 were derived.

7.1.1 Impact Significance Methodology

The **Significance** of Environmental Impacts is to be assessed by means of the following method: **Significance is the product of probability** and **severity. Probability** describes the likelihood of the impact actually occurring, and is rated as follows:			
•	Improbable	-	Low possibility of impact to occur either because of design or historic experience. *Rating = 2*
•	Probable	-	Prominent possibility that impact will occur. *Rating = 3*
•	Highly probable	-	Most likely that impact will occur. *Rating = 4*
•	Definite	-	Impact will occur regardless of any prevention measures. *Rating = 5*

1.1.1.1 The severity rating is calculated from the factors given to intensity and duration. Intensity and duration factors are awarded to each impact, as described below.

The **Intensity factor** is awarded to each impact according to the following method:

•	Low intensity	-	Nature and/or man-made functions not affected, and a minor impact may occur. *Factor 1*
•	Moderate intensity	-	Environment affected but natural functions and processes can continue though often in a slightly altered manner. *Factor 2*
•	High intensity	-	Environment affected to the extent that natural functions are altered to the extent that it will temporarily or permanently cease. *Factor 3*

Duration is assessed and a *factor* awarded in accordance with the following:

•	Short term	-	≤ 1 to 5 years *Factor 2*
•	Moderate term	-	5 – 15 years *Factor 3*
•	Long term	-	Impact will only cease after the operational life of the activity, either because of natural process or by human intervention. *Factor 4*
•	Permanent	-	Mitigation, either by natural process or by human intervention, will not occur in such a way or in such a time span that the impact can be considered transient. *Factor 5*

The **severity rating** is obtained from calculating a severity factor, and comparing the severity factor to the rating in the table below, for example:

The Severity factor	Intensity factor X Duration factor 2 X 3 = 6

A Severity factor of 6 (six) equals a Severity Rating of Moderate severity (Rating 3) as per table below:

Severity Ratings

		FACTOR	
	Low Severity (Rating 2)	Calculated values 2 to 4	
	Moderate Severity (Rating 3)	Calculated values 5 to 8	
	High Severity (Rating 4)	Calculated values 9 to 12	
	Very High Severity (Rating 5)	Calculated values 13 to 16 and more	

	Severity factors below 3 indicate no impact		
1.1.1.2 *A Significance Rating is calculated by multiplying the Severity Rating with the Probability Rating:* *1.1.1.3 The significance rating should influence the development project as described below:*			
•	Low significance (calculated Significance Rating 4 to 6)		
		-	Positive impact and negative impacts of low significance should have no influence on the proposed development project
•	Moderate significance (calculated Significance Rating ≥ 7 to 12)		
		-	Positive impact Should indicate that the proposed project should be approved
			Negative impact: Should be mitigated or mitigation measures should be formulated before the proposed project can be approved
•	High significance (calculated Significance Rating ≥ 13 to 18)		
		-	Positive impact: Should points towards a decision for the project to be approved and should be enhanced in final design
			Negative impact: Should weigh towards a decision to terminate proposal, or mitigation should be formulated and performed to reduce significance to at least low significance rating.
•	Very High significance (calculated Significance Rating ≥ 19 to 25 and more)		

7.2 ACTIVITIES AND IMPACTS IDENTIFIED, WITH IMPACT ASSESSMENT

The description and identification of anticipated impacts is based on the listing of **environmental aspects.** Environmental aspects, for the purposes of this document, is the term used to *describe the actions that may have an impact on one or more of the environmental components listed.* It is important to note that aspects that are clearly definable have been used in preference to those that are duplicative, redundant, difficult to measure, and/or obscure.

An impact is defined as *any change in the physical, chemical, biological, cultural, and/or socio-economic environmental system that can be attributed to human activities relative*

to alternatives under study for meeting a project need. Therefore, the identified environmental aspects are said to have an impact on the components listed above if they result in change.

One of the most important objectives of conducting and Environmental Impact Assessment is to identify and evaluate these aspects and impacts. Consequently, the EMPr will consist of the preferred mitigation and management options for the identified impacts assessed as being significant. These will be described within the EIA (and EMPr) report to follow.

The environmental aspect and the resultant impact can become manifest during the **construction phase (C)** and/or the **operational phase (O)**, which is the stage when the proposed development is complete and fully functional.

The following table provides a list of activities (environmental aspects) that will occur on site, and it provides an outline of the potential impacts that these actions will have on the environment, the anticipated effects on the biophysical and social aspects. The identification of the aspects and impacts may be expanded as more information becomes available when the specialist studies are completed. At this stage, the table below provides a list of impacts and issues. Below is a preliminary assessment of the impact identified for only the preferred activity alternative in the Table 4.

The identified impacts are rated in terms of their significance during the construction phase and the operational phase of the proposed development. The identified impacts on the physical, ecological and social components of the site are discussed in terms of:

- Vegetation component of the site;
- Faunal component of the site;
- Impact on Red Data Fauna and Flora;
- Soil surface (stability);
- Topsoil layer (disturbance and compaction);
- Subsurface soil quality;
- Topography;
- Geology;
- Surface drainage and existing water bodies (streams within the study

area);

- Surface water run-off (quality);
- Groundwater resources (quality);
- Air quality (due to dust generation);
- Ambient noise levels;
- Cultural historical elements;
- Social environment (of adjacent landowners);
- Traffic safety aspects (safety of the community);
- Land use options and agricultural potential of the site;
- Visual and aesthetic quality;
- Local economy (due to job creation); and
- Impact on the community (due to provision of affordable electricity).

It should be noted that the impact significance rating is given presuming that no mitigation measures are to be implemented during the construction or operational phase of the project (this would imply a worst case scenario).

The following Table 4 is focused on the preferred alternative A:

Table 4: List of activities (environmental aspects) that will occur on site, the potential impacts that these activities may have on the environment and a description of the nature of the impact (c: construction stage; o: operational phase).

The impacts rated, at this stage of high importance, are marked with a red triangle Δ; leaning towards high significance impact.

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Vegetation clearance for the footprint of the proposed development (C). Clearance of vegetation in the establishment of infrastructure (C)	Soil layers, soil surface, indigenous vegetation cover.	At natural grassland sites, next to the streams/rivers, and where the construction camp and stockpile areas are to be established.	The removal of vegetation cover, such that the soil surface is exposed, may lead to increased soil erosion in certain areas. The existing vegetation will be permanently removed to accommodate the footprint of the road. Where the removal of surface vegetation is of a temporary nature only, the establishment of weeds is a threat. The topsoil layer is required to rehabilitate the area (i.e., for landscaping the area). Δ **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance= 4x4=16** **This impact is of negative high significance before mitigation.**	It is advisable that only vegetation be removed where and when it is necessary. After removal of vegetation, an offset needs to be incorporated by re-establishing natural vegetation/grassland along the road shoulder. No red data plant species were recorded during the site visits conducted. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Stockpiling of excavated material (C)	Soil and vegetation cover.	Precise location still to be determined; the impacts on soil and vegetation will occur wherever stockpiles are established. Wherever possible, the stockpiles should be placed in non-sensitive areas.	Stockpiles cause compaction of the soil, which promotes the establishment of weed species. The establishment of weeds greatly reduces the pristine quality of the natural vegetation on site. Stockpiles should not be situated within 200 m from any water bodies or water courses, as sedimentation transport into such systems is undesirable. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	Stockpiles must not exceed 2 metres in height. Stockpiles must be used for filling material as the re use of stockpiles cannot be done on the road. By using the stockpiles as filling material for the sides, vegetation growth can be promoted by the seeds still contained in the topsoil layer. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Stockpiling building materials (C)	Soil and vegetation cover.	The impact is of a localized nature.	Stockpiles will need to be established for the storage of aggregate, bricks and cement. As mentioned, stockpiles cause compaction of the soil surface, which leads to the growth of unwanted weed species. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	Building material stockpiles must not be stockpiles within any of the riparian areas. Any alien vegetation that established itself because of disturbance need to be eradicated. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Water use for construction purposes.	Use of ground water resources is anticipated. A **water license application** is being conducted in this regard. WULA will concentrate on: • Section 21(a): taking water from a water resource. • Section 21(b): storing water. • Section 21(c): impeding or diverting the flow of water in a watercourse. • Section 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource;	Local ground water and future dams.	The use of water as an important resource must be assessed carefully and a statement should be made on the impact once it has been established what the source of the water for construction purposes will be. The Water use licence is also necessary because of the cropland, etc., being developed, will be less than 500 metres from a wetland. If water is used for the construction from groundwater sources, it is possible that the development can influence the ground water level. If water from the stream is used, damage to the riverbanks can occur. **Δ** **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance = 4x4=16**	If water is used for the road construction from groundwater sources, then a WULA will have to be issued in this regard, which is in process for this project. Possible significance assessment on ground water resources would be of moderate significance, because it will most likely come from boreholes that already have an established daily limit. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
	and; • Section 21(i): altering the bed, banks course or characteristics of a watercourse.		**This impact is of negative high significance before mitigation.**	
Installation and operation of temporary sewerage systems for construction workers.	Soil layers, vegetation cover and groundwater.	Very localised and of a temporary nature.	The placement of chemical toilet systems and the servicing thereof will not have an impact on the environment, if operated according to requirements. Temporary toilets left unmanaged can leak raw sewage and effluent into the soil, surface and even ground water sources. Δ **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance = 4x4=16** **This impact is of negative high significance before mitigation.**	Temporary toilets need to be managed and serviced on a regular service schedule. This schedule has to be recorded and controlled by the contractor on site. Regular disposal of waste needs to be done by a contracted disposal company. No temporary toilets will be allowed within 100 metres from any of the drainage lines. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
				This impact is of negative low significance
Provisions for storm water i.e., storm water drainage (C)	Soil surfaces, vegetation cover and drainage patterns.	Areas where surface water run-off is collected i.e., like from compacted surfaces, as well as road surfaces.	Poorly implemented storm water outlets will result in increased surface run-off volume and speed, which could lead to the creation of erosion gullies. Storm water must be allowed to spread out gradually over a large surface area to protect the soil surface against erosion. Inadequate designed storm water outlets can lead to flooding of the road surface which is dangerous. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	Storm water outlet designs have to be done and construction undertaken within the correct design. Vegetation cover needs to be established on bare soil areas to prevent erosion due to storm water. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Maintenance of storm water management systems (O)	Soil surfaces, drainage patterns and surface water.	In all areas where storm water management systems have to be created.	Storm water management will particularly be important with careful design eminent at the crossing of any natural drainage ways. Storm water outlets can get blocked due to debris and other substances that are washed from the road surfaces. This includes siltation due to soil erosion. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	Maintenance of storm water outlets is required to ensure that they don't get blocked (i.e. no longer fulfil their function) or result in erosion. The custodian of the development has to perform regular checks and maintenance. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Excavations in general	Potential impact on elements of cultural or heritage importance.	Localised if these may occur	No indication of such impacts. But this will be confirmed in the Heritage report. It is possible that historically important structures, items or graves could be uncovered if construction commences. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	If any artefacts, graves or articles of historical importance are found during construction, the construction activities have to be stopped and the area fenced off. A heritage consultant will have to be appointed to take any further related steps such as relocation. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Generation of construction waste (C)	Soil, vegetation, aesthetic quality of the site and surface water run-off, water and ground water resources.	All construction sites and directly adjacent areas.	Waste, such as building rubble and empty cement bags can be a negative visual impact if not collected and disposed of correctly. Further to littering the site and adjacent areas, poor control and illegal dumping of construction waste can pollute surface water run-off, as well as lead to the promotion of weed species. Δ **Probability = 4 (highly probable)** **Intensity = 4 (moderateintensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance = 4x4=16** **This impact is of negative high significance before mitigation.**	Building rubble has to be collected at a centralized area and preferably in skip waste bins. No illegal dumping may be allowed in the construction phase, and this will have to be checked and monitored by the appointed Environmental Control Officer. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**
Access road and internal road maintenance (O)	Vegetation and soil surface conditions, as well as social well-being of the residents of the area.	The entire road will need to be maintained.	Poorly maintained storm water drainage structure will cause abnormal soil erosion at outlets. Therefore, road maintenance is essential. **Probability = 3 (probable)**	Road maintenance is essential and is the responsibility of the road custodian in the operational phase. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			Intensity = 2 (low intensity) **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	**Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**
Collection and disposal of solid construction waste (C)	Aesthetic quality, surface water run-off, subsurface and groundwater quality, vegetation and fauna.	The site and directly adjacent areas.	Poor waste collection and handling will pollute the environment (affecting fauna, groundwater, surface water and aesthetic environment). **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	No illegal dumping of domestic and construction related waste should be tolerated. Domestic construction waste has to be collected into central waste skip disposal units. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Temporary employment created during the construction phases of the proposed road development(C)	Social aspects	All sites where construction related activities are to take place.	There will be **positive i**mpacts in terms of social upliftment and job creation within the broader region.	
Transportation of workers to and from the road development site (C)	Air quality, soil surface and social aspects (including traffic and worker safety).	The road safety of the region. A local issue.	Vehicles used to transport workers can be overloaded; worker safety is of utmost importance. Vehicles used to transport workers which exceed the speed limit are dangerous. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	Traffic safety measures have to be implemented by the contractor. Correct signage and safety clothing needs to be in place. Construction workers need to be transported to and from the site on a safe manner. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Construction camp establishment (C)	Aesthetic impacts, social aspects, subsurface and groundwater quality, generation of domestic waste, vegetation removal, soil surface compaction and faunal impacts.	Location still to be determined.	The generation of domestic waste, as well as the provision of sewage facilities, within the construction camp could potentially impact on the aesthetics of the site as well as the quality of subsurface and groundwater if not properly managed and implemented. The removal of sections of natural vegetation would most likely be needed for the establishment of the camp, and soil surfaces would become compacted as a result of activities within the camp. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	Proper management of any temporary toilets need to be undertaken on a strict schedule. The construction camp must be more than 100 metres away from any water bodies. Construction camps **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Housing of workers during construction (C)	Aesthetic character, soil and vegetation, surface water quality and social aspects.	The possibility of housing construction workers on site.	The establishment of housing for workers will have a localised impact on the soil and vegetation cover of the chosen site, as well as potentially having a negative impact on the quality of surface water – because of domestic waste, and sanitation facilities for example, if these are not properly addressed. Safety is also a concern to residence and stay of workers on site should not be encouraged. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	Housing of workers on site, at the construction camp, is a possibility. Preferably only security should look after equipment at night-time hours. If workers are housed near 'residential' areas, it could create a safety concern. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Sanitation provision to workers during the working day (C)	Subsurface soil, surface water and subsurface water quality.	Insufficient chemical toilets will have a health impact locally.	Insufficient chemical toilets will have a health impact. Subsurface soil contamination and contamination of surface/subsurface water quality could occur if the ablution facilities provided are not according to standard. A temporary impact is possible; however, it can easily be prevented. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	Sufficient chemical toilets should be provided for workers, in the range of 1 per every 8 workers, within walking distance of all construction activities. These toilets must be well maintained and inspected on a daily basis to ensure that they are clean and functioning properly. No washing of people and/or goods should take place on cleared surfaces, as this water should not be allowed to drain into any adjacent storm water canals or drainage lines. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Movement of construction vehicles on site (C)	Air quality, soil and vegetation cover.	Potential impacts may be eminent over a wide area if not carefully managed and restricted.	Movement will cause limited or localised disturbances and temporary soil compaction, which promotes the establishment of weed species. Dust will be generated by vehicular movements on site. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	Alien plant species need to be controlled and it must be ensured that weeds are removed. Dust depression measures such as watering the bare surfaces need to be implemented. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Maintenance of construction vehicles (C)	Soil, vegetation and surface water.	Within the construction camp(s).	In the event of on-site repairs and servicing, soil surfaces, vegetation, and run-off may be locally contaminated. Spillage of fuel through faulty bowser is a possibility, if not controlled. It is anticipated that fuel storage facilities will occur on the site. If poorly installed or managed it will cause pollution. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	The construction camp has to be identified and communicated to the ECO as soon as its position is available. Any fuel depot areas have to be bunded and where fuel hoses will operate, absorbing gravel needs to be provided. This area can also be lined with a small piece of plastic below the gravel. As soon as any spillages occur, the gravel has to be collected and disposed of as hazardous waste. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Traffic safety on the main roads in the area (C and O)	Social aspects.	At all places where there will be interaction with the local traffic along existing routes as well as traffic moving through the area.	Motorists using the main routes and alternative roads may be negatively impacted on by slow moving construction vehicles. **Δ** **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance = 4x4=16** **This impact is of negative high significance before mitigation.**	Traffic safety measures have to be implemented to ensure that the general public is safe. Adequate traffic signage has to be implemented where any heavy vehicles will cross the main roads. Adequate clothing that is visible should be provided to the workers. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Noise generation by operating air compressors, excavators and other heavy machinery. Noise is also generated by the construction workers (C)	Impacts on faunal surrounding landowners.	Areas on and surrounding site at which construction activities take place.	Excessive noise levels on site may negatively impact upon the behaviour and movements of site fauna. Surrounding landowners may also potentially be negatively impacted upon by excessive noise levels on site during construction. **Δ** **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance = 4x4=16** **This impact is of negative high significance before mitigation.**	Noise mitigation measures are required in order to keep the noise generated by construction activities as low as possible – given the site's relatively close proximity to some farmsteads. This can be achieved by ensuring that only well-oiled, well-maintained machinery is used, as such machinery will produce less noise than poorly serviced machinery. For example, poor maintenance of exhaust systems will produce unnecessary noise pollution. Furthermore, working hours for construction should be limited to between 07h00 and 17h00 on weekdays, as construction outside of these time frames will be a nuisance to adjacent dwellers. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
				Significance= 3x3=9 **This impact is of negative moderate significance**
Heritage (C)	**Heritage or historical components**	No currently historical features identified are present on site. Except for gravers found in the north-western corner of the southern section Still to be confirmed by a HIA specialist.	The proposed development is to be conducted on new sections not affected by previous road infrastructure. The interchanges are not situated on any historical landmarks. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**	If any areas of historical significance are discovered during construction, work should be stopped, and a cultural specialist should investigate the site. The first contact can be made with the EAP on site. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance= 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Impact on the river and wetlands	Water quality, soil, and the stream beds	Around the wetland and stream areas.	Impacts on the streams and wetlands will be caused by the development of the adjacent cropland. Possible siltation into rivers and wetlands is highly likely. **Δ** **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance = 4x4=16** **This impact is of negative high significance before mitigation.**	Impacts in the river and wetland areas will have to be determining by an aquatic/wetland specialist. This will be conducted as part of the process after the EIA has been conducted and will most likely be a request from the Department of Water Affairs. No activities to be undertaken within the stream areas, as far as possible, and rehabilitation has to be undertaken during and after construction. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Movement and survival of Animal species	Fauna of the site	Within the agricultural zone/dam wall and dam area where grassland will be removed/disappear.	The construction will have an effect on the animals present within the development sites. These impacts will include habitat destruction. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**	Specialist studies will determine an overview of the habitat present in the proposed sites. Red data fauna have been recorded during the EAP's site visit. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance= 3x3=9** **This impact is of negative moderate significance**
Construction of the development on red data animals	Animals	Within the agricultural zone/dam wall and dam area where grassland will be removed/disappear.	The construction of the development will influence animal life and habitat. Red data species were recorded during the site visits. **Δ** **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)**	Although habitat will be lost, proper rehabilitation of the affected grassland and dam wall areas could lessen the severity of the impact. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			Significance= 4x4=16 This impact is of negative high significance before mitigation.	This impact is of negative moderate significance

7.2.1 Summary of the Significance Rating of the Anticipated Impacts

ENVIRONMENTAL AND OTHER COMPONENTS TO BE AFFECTED C = relevant to construction stage O = relevant to operational phase	Probability value	Intensity value	Duration value	Severity value	Significance rating
Impact on the vegetation component of the site	C: 4 O: 3	4 2	4 2	4 2	16: High (negative) 6: Low (negative)
Impact on the faunal component of the site	C: 4 O: 4	4 2	4 4	4 3	16: High (negative) 12: Moderate (negative)
Impact on Red Data Fauna and Flora	C: 4 O: 2	2 2	2 2	2 2	8: Moderate (negative) 4: Low (negative)
Impact on soil (surface stability)	C: 3 O: 2	2 1	2 4	2 2	6: Low (negative) 4: Low (negative)
Impact on soil (topsoil layer - disturbance and compaction)	C: 4 O: 2	2 2	2 2	2 2	8: Moderate (negative) 4: Low (negative)
Impact on subsurface soil quality	C: 2 O: 2	2 2	2 4	2 3	4: Low (negative) 6: Low (negative)
Impact on topography	C: 2 O: 0	2 0	2 0	2 0	4: Low (negative) 0
Impact on geology	C: 2 O: 0	2 0	2 0	2 0	4: Low (negative) 0
Impact on surface drainage and existing water bodies	C: 4 O: 4	4 2	4 4	4 3	16: High (negative) 12: Moderate (negative)
Impact on surface water run-off quality	C: 4 O: 3	4 2	4 4	4 3	16: High (negative) 9: Moderate (negative)
Impact on groundwater resources	C: 4 O: 4	2 2	4 2	3 2	12: Moderate (negative) 8: Moderate (negative)
Impact on air quality	C: 3 O: 3	2 2	4 2	3 2	9: Moderate (negative) 6: Low (negative)
Impact on ambient noise levels	C: 3 O: 2	2 2	4 2	3 2	9: Moderate (negative) 4: Low (negative)
Impact on cultural historical & archaeological elements	C: 0 O: 0	0 0	0 0	0 0	0 0
Impact on the social environment of the adjacent landowners	C: 3 O: 3	2 2	4 2	3 2	9: Moderate (negative) 6: Low (negative)
Impact on traffic safety aspects	C: 4 O: 3	4 2	4 4	4 3	16: High (negative) 9: Moderate (negative)
Impact on land use & agricultural potential	C: 3 O: 2	2 2	4 2	3 2	9: Moderate (negative) 4: Low (negative)
Impact on visual and aesthetic quality	C: 4 O: 4	2 2	4 2	3 2	12: Moderate (negative) 8: Moderate (negative)
Impact on local economy (due to job creation)	C: 4 O: 4	2 2	2 2	2 2	8: Moderate (positive) 8: Moderate (positive)
Impact on community (due to job creation)	C: 4 O: 4	2 2	2 2	2 2	8: Moderate (positive) 8: Moderate (positive)

7.3 CUMULATIVE IMPACTS

According to the definition 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.

Cumulative impact on other physical components such as natural vegetation and animal life, air quality and visual impact is regarded at this stage as of moderate significance, due to the outstretched and spacious nature of the landscape and the proposed development will tie into the current infrastructure and natural lay of the land of the area; possible secondary waste or pollution is predicted.

The possible cumulative impacts foreseen will be the loss of natural habitat, surface water flow impediment and possible agricultural chemical pollution into the natural environment. All impacts from the construction phase of the development should be continually mitigated. Thus, potentially no high significant cumulative impacts are predicted.

The possible cumulative impacts from the similar developments connecting to this road will be assessed in the table below.

ENVIRONMENTAL ASPECT AND PROJECT STAGE **C: construction stage** **O: operational phase**	**ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED**	**NATURE AND DESCRIPTION OF THE POTENTIAL CUMULATIVE IMPACT IN ASSOCIATION WITH THE SURROUNDING AREA**
Vegetation clearance for the footprint of the development (C).	Soil layers, soil surface.	Seen at a wider scale the additional developments are physically connected, but the removal of vegetation cover, such that the soil surface is exposed, may lead to increased soil erosion in the area. Where the removal of natural vegetation is moderate in percentage to the whole activity it may add to a bigger combined loss of natural vegetation/habitat for the local area.

ENVIRONMENTAL ASPECT AND PROJECT STAGE C: construction stage O: operational phase	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	NATURE AND DESCRIPTION OF THE POTENTIAL CUMULATIVE IMPACT IN ASSOCIATION WITH THE SURROUNDING AREA
Excavations for the foundations of the development (C).	Soil layers and faunal habitat.	The existing natural vegetation will be permanently removed to accommodate the foundations of the necessary structures. Faunal habitat will also be affected in combination with the surrounding developments. Soil layers affected will be a localised impact and not cumulative.
Stockpiling of excavated material (C)	Soil and vegetation cover.	Stockpiles cause compaction of the soil, which promotes the establishment of weed species. This impact is of a temporary nature and not cumulative.
Stockpiling building materials (C)	Soil and vegetation cover.	Stockpiles will need to be established for the storage of aggregate, concrete infrastructure and cement, etc. As mentioned, stockpiles cause compaction of the soil surface, which leads to the growth of unwanted weed species. This impact is of a temporary nature and not cumulative.
Provisions for storm water i.e., storm water drainage (C)	Soil surfaces, vegetation cover and drainage patterns.	Correct and efficient storm water drainage systems must be installed. Poorly designed storm water outlets will result in increased surface run-off volume and speed, which could lead to

ENVIRONMENTAL ASPECT AND PROJECT STAGE C: construction stage O: operational phase	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	NATURE AND DESCRIPTION OF THE POTENTIAL CUMULATIVE IMPACT IN ASSOCIATION WITH THE SURROUNDING AREA
		the creation of erosion gullies. All road and ploughed surfaces generate storm water, which should be controlled by preventing the storm water from crossing the road. Storm water must be allowed to spread out gradually over a large surface area to protect the soil surface against erosion. The surrounding developments may contribute to more erosion due to more cleared and open surfaces found at these developments.
Generation of construction waste (C)	Soil, vegetation, aesthetic quality of the site and surface water run-off, water and ground water resources.	Waste, such as building rubble and empty cement bags can be a greater negative visual impact, with the additional construction waste of the staff courters, if not collected and disposed of correctly. Further to littering the site and adjacent areas, poor control and illegal dumping of construction waste can pollute surface water run-off, as well as lead to the promulgation of weed species.
General maintenance (O)	Visual quality, also surface water quality and vegetation cover.	The design and nature of the development will determine the impact of the development on the visual quality of the study area. Maintenance as a whole will prevent a further

ENVIRONMENTAL ASPECT AND PROJECT STAGE C: construction stage O: operational phase	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	NATURE AND DESCRIPTION OF THE POTENTIAL CUMULATIVE IMPACT IN ASSOCIATION WITH THE SURROUNDING AREA
		negative impact on the visual quality of the study area. The disposal of general solid waste and construction rubble (both during construction and maintenance of the development and staff courters) causes impacts on the natural environment (including faunal ecology, surface water and vegetation) if disposed of illegally. Compaction of soil surfaces and the propagation of weeds are typical impacts, but temporary.
Collection and disposal of solid domestic waste (C)	Aesthetic quality, surface water run-off, subsurface and groundwater quality, vegetation, and fauna.	Poor waste collection and handling on all the developments in and around the proposed development will pollute the environment (affecting fauna, groundwater, surface water and aesthetic environment). No illegal dumping of domestic waste will be tolerated. Untidy collection points and windblown refuse can cause human / animal conflicts, as foul odours from such areas will attract wild animals and cause other problems (pests / diseases), as well as water pollution.
Collection and disposal of construction waste (C)	Aesthetic quality, subsurface and ground water	No construction waste may be illegally dumped into the surrounding areas, as the effects of illegal dumping on the

ENVIRONMENTAL ASPECT AND PROJECT STAGE C: construction stage O: operational phase	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	NATURE AND DESCRIPTION OF THE POTENTIAL CUMULATIVE IMPACT IN ASSOCIATION WITH THE SURROUNDING AREA
	quality, vegetation and fauna.	environment are devastating. Poor waste collection and handling on all the developments in and around the proposed development will have a negative impact on several environmental aspects. A waste collection agreement between the applicant and the local authority will be essential.
Long term employment opportunities and wealth to be generated (O)	Social aspects	There will be a positive impact in terms of social upliftment and job creation within the broader region.
Transportation of workers to and from the development site (C)	Air quality, soil surface and social aspects (including traffic and worker safety).	Poorly maintained vehicles will have a negative impact on air quality in terms of dust and emission.
Construction camp establishment (C)	Aesthetic impacts, social aspects, subsurface and groundwater quality, generation of domestic waste, vegetation removal, soil surface compaction and faunal impacts.	The generation of domestic waste, as well as the provision of sewage facilities, within the construction camp could potentially impact on the aesthetics of the site as well as the quality of subsurface and groundwater if not properly managed and implemented. Soil surfaces would become compacted as a result of activities within the camp. These

ENVIRONMENTAL ASPECT AND PROJECT STAGE C: construction stage O: operational phase	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	NATURE AND DESCRIPTION OF THE POTENTIAL CUMULATIVE IMPACT IN ASSOCIATION WITH THE SURROUNDING AREA
		impacts will also add to the negative impact other close by developments has on the local area, but only during the construction phase.
Movement of construction vehicles on site (C)	Air quality, soil.	Movement will cause limited or localised disturbances and temporary soil compaction, which promotes the establishment of weed species. Dust will be generated by vehicular movements on site. The tipper trucks from the nearby towns will also add to the negative impact on air quality, but only during the construction phase.
Traffic safety on the main road (C and O)	Social aspects.	The farm access points to the site; therefore, motorists using the main road may be negatively impacted on by slow moving construction vehicles. The tipper trucks from the nearby towns will also add to traffic impact, but only during the construction phase.
Noise generation by operating air compressors, excavators and other heavy machinery. Noise is also generated by the construction workers (C)	Impacts on faunal species and surrounding landowners.	Excessive noise levels on site may negatively impact upon the behaviour and movements of site fauna. Surrounding landowners may also potentially be negatively impacted upon by excessive noise levels on site during construction. The tipper trucks and excavators from the nearby towns

ENVIRONMENTAL ASPECT AND PROJECT STAGE C: construction stage O: operational phase	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	NATURE AND DESCRIPTION OF THE POTENTIAL CUMULATIVE IMPACT IN ASSOCIATION WITH THE SURROUNDING AREA
		will also add to the noise impact, but only during the construction phase.

7.4 ECOLOGICAL SPECIALISTS' IMPACT ASSESSMENT & RECOMMENDATIONS

(SEE APPENDIX 8 FOR THE FOR ALL THE ECOLOGICAL STUDIES)

7.4.1 Impact rating in terms of Flora

Impact 1: Loss of Indigenous and / or Natural vegetation and habitat fragmentation.

Site clearance and destruction of vegetation habitat leading to increase in habitat loss.

Impact rating before mitigation:

Impact	Severity	Duration	Extent	Consequence (S + D + E / 3)	Frequency	Probability	Likelihood (F + P / 2)	Significance (C*L)
Impact on Indigenous Natural Vegetation.	5	5	2	4	5	5	5	20 High

Mitigation measures for Impact on Natural vegetation:

- Unnecessary impacts on surrounding natural vegetation must be avoided.
- The wetlands and rivers were delineated by a wetland specialist. Wetland and river buffers must be imposed around these sites as indicated within a High sensitivity.
- The construction impacts must be contained within the footprint of the proposed areas. Wetland areas must be avoided, and the site must be shifted to exclude wetland areas and buffers.
- Areas containing indigenous vegetation of the Soweto Highveld grassland is marked as Medium in the sensitivity assessment. These areas are isolated and impacted on in terms of the Mpumalanga sector plans.
- Disturbed areas beyond the footprint of the infrastructure must be rehabilitated as quickly as possible.

Impact rating after mitigation:

Impact	Severity	Duration	Extent	Consequence (S + D + E / 3)	Frequency	Probability	Likelihood (F + P / 2)	Significance (C*L)
Impact on Indigenous Natural Vegetation	3	4	1	2.66	5	2	3.5	9.81 Low

Impact 2: Loss of Individual or threatened plants

1 species were identified to potentially occur in and around the study site by using the DEFF screening tool. This species was searched for and not found on site or within 200m around the study site. The overall significance of the impact is therefore rated as low. No Orange data plant was found inside of the development area.

Impact rating before mitigation:

Impact	Severity	Duration	Extent	Consequence (S + D + E / 3)	Frequency	Probability	Likelihood (F + P / 2)	Significance (C*L)
Impact on Indigenous Natural Vegetation.	3	4	1	2.66	5	2	3.5	9.81 Low

Mitigation measures for Loss of individual or threatened plants:

- Unnecessary impacts on surrounding natural vegetation must be avoided.
- The construction impacts must be contained within the footprint of the development. Disturbed areas beyond the footprint of the development must be rehabilitated as quickly as possible.

Impact	Severity	Duration	Extent	Consequence (S + D + E / 3)	Frequency	Probability	Likelihood (F + P / 2)	Significance (C*L)
Impact on Indigenous Natural Vegetation	3	4	1	2.66	5	2	3.5	9.81 Low

Impact 3: Establishment and spread of declared weeds and alien invader plants

Clarence of vegetation will lead to the establishment of pioneer species and alien and invasive plant species. This is already evident as there is 3 NAMBA listed invader species found on site.

Impact rating before mitigation:

Impact	Severity	Duration	Extent	Consequence (S + D + E / 3)	Frequency	Probability	Likelihood (F + P / 2)	Significance (C*L)
Establishment and spread of declared weeds and alien invader plants.	5	5	2	4	5	5	5	20 High

Mitigation measures for establishment and spread of declared weeds and alien invader plants:

- Soil stockpiles should not be translocated from areas with alien plants into the site and within the site alien plants on stockpiles must be controlled to avoid the development of a soil seed bank of alien plants within the stock-piled soil.
- Any alien plants must be immediately controlled.
- An on-going monitoring programme should be implemented to detect and quantify any aliens that may become established and provide information for the management of aliens.

Impact rating after mitigation:

Impact	Severity	Duration	Extent	Consequence (S+D+E/3)	Frequency	Probability	Likelihood (F+P/2)	Significance (C*L)
Establishment and spread of declared weeds and alien invader plants	4	4	2	3	4	1	2.5	7.5 Low

Impact 4: Soil Erosion

After the clearance of vegetation, soils are vulnerable to erosion. In the absence of mitigation, the likelihood and severity of this impact will increase the longer the soil is exposed. However, if mitigation measures are implemented this can be reduced to a low negative significance if the recommended mitigation measures are implemented

Impact rating before mitigation:

Impact	Severity	Duration	Extent	Consequence (S+D+E/3)	Frequency	Probability	Likelihood (F+P/2)	Significance (C*L)
Potential of soil erosion	3	3	2	2.66	5	5	5	13.3 Medium

Mitigation measures for erosion

- All cleared areas to be reseeded immediately to stabilize the soil.
- Any removed topsoil must be replaced as soon as possible for reseeding and resprouting of seeds to take place.

Impact rating after mitigation:

Impact	Severity	Duration	Extent	Consequence (S+D+E/3)	Frequency	Probability	Likelihood (F+P/2)	Significance (C*L)
Potential of soil erosion	4	4	2	3	4	1	2.5	7.5 Low

7.4.2 Impact rating in terms of the Wetlands

North of the R29

Water course. There is a water course crossing the North-western part of the site. At the upstream (Northern) part of the site there was standing water. There are small dams on this water course but at the time of the site visit these were not holding water. The water visible in the dam is on the neighbouring property.

Roadside borrow pits. There are two borrow pits to the north of the road. Both of these were holding water at the time of the site visit.

South of the R29

There is a drainage line flowing across the southern part of the site. There is a dam on this drainage line which was overflowing through the spillway at the South-western end of the wall. The drainage line flowing across the North-western side of the property flows into this line, flowing back onto the property South of the R29. There is an unchannelled valley bottom wetland running southwards from the R29 (-26.379583° 29.021565°) joining this drainage line at the upstream end of the dam (-26.383543° 29.019655°). At the time of the site visit the clay in this unchannelled valley bottom wetland was wet, indicating that it is a temporary wetland and so it has been delineated as such. The average slope of this unchannelled valley bottom wetland is 3.6 m/100 m which is steeper than palustrine wetlands are generally found. However, the clay soil, the moisture content and the vegetation indicate that this is, in fact, a wetland.

There was a lot of seepage downstream of this dam wall, contributing to the flow of water downstream.

Most of the wet areas on the site were riparian. The only wetland area is the unchannelled valley bottom wetland running from the R29 southwards into the dam to the South of the R29.

Table 11-1: Measure of the severity of the impact at a site (Kleynhans et al., 2008).

IMPACT/SEVERITY CLASS	DESCRIPTION	RATING
None: reference	No discernible impact or the modification is located in such a way that it has no impact on habitat quality, diversity, size and variability.	0
Small	The modification is limited to very few localities and the impact on habitat quality, diversity, size and variability are very small.	0.5-1.0
Moderate	The modifications are present at a small number of localities and the impact on habitat quality, diversity, size and variability are limited.	1.5-2.0
Large	The modification is generally present with a clearly detrimental impact on habitat quality, diversity, size and variability. Large areas are not influenced.	2.5-3.0
Serious	The modification is frequently present and the habitat quality, diversity, size and variability in almost the whole of the defined area are affected. Only small areas are not influenced.	3.5-4.0
Critical	The modification is present overall with a high intensity. The habitat quality, diversity, size and variability in almost the whole of the defined section are influenced detrimentally.	4.5-5.0

Hydrology: The area is generally wet with the water courses holding surface water and the seasonal wetland being moist.

• Severity of impact – 1

Geomorphology: The gradient of the general area is steeper than would normally support palustrine wetlands, but the water courses on the property are not eroded.

• Severity of impact – 1.5

Physico-Chemical changes: Physico-Chemical changes were not measured, although there was no cultivation, implying that currently there would be no fertiliser runoff.
This is likely to change, however, when the area is developed for vegetable production.

• Severity of impact – 1

Overall assessment of PES: B (Largely natural with few modifications / C (Moderately modified). The reason for the B/C assessment is that the area has been cultivated in the past, but it is currently reverting to a less disturbed state (Score – 79 – 80).

Wetland Unit identification

The wetland is identified as an unchannelled Valley bottom wetland.

Description of wetland type

his unchannelled Valley bottom wetland is relatively short (+500 m) with a relatively steep gradient (3.6 m / 100 m).

General functional description of wetland types
The length combined with the gradient of the wetland means that this wetland does not make much contribution to the ecosystem services. The vegetation of the wetland is in good condition so there is no erosion.

Wetland ecological functional assessment
This is a seasonal wetland, verging on temporary. It will only be wet in the wet season. The soil type (clay) will, however, hold water for some time after it has been wetted.

Present ecological State (Ecological Health) assessment
The riparian and wetland areas on the site are generally in good condition.

Impact Assessment discussion:
Currently the only use of the property is for cattle grazing, and so the impact is low. The dams on site have been there for some time and so are not posing any additional risks or impacts.

The slope of the site will make it vulnerable to erosion if developments are not carefully planned and carried out. This means that the proposed development will need to be done carefully and at a time when there is less likelihood of rain. so as not to pose risk to the site.

7.4.3 Assessment and recommendations from Heritage Specialist

- There are no visible restrictions or negative impacts in terms of heritage associated with the site;
- In terms of heritage the proposed project may continue; and
- The discovery of subsurface archaeological and/or historical material as well as graves must be taken into account in the Environmental Management Programme. See 3.2.6 and 3.2.7; and
- Submit this report as a Section 38 application to the relevant heritage authority for approval/comment.

7.5 FEASIBILITY AND COMPARISON OF ALTERNATIVES

7.5.1 Alternative Livestock Activity

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Vegetation clearance for the footprint of the proposed development (C). Clearance of vegetation in the establishment of infrastructure (C)	Soil layers, soil surface, indigenous vegetation cover.	At natural grassland sites, next to the streams/rivers, and where the construction camp and stockpile areas are to be established.	The removal of vegetation cover, such that the soil surface is exposed, may lead to increased soil erosion in certain areas. The existing vegetation will be permanently removed to accommodate the footprint of the road. Where the removal of surface vegetation is of a temporary nature only, the establishment of weeds is a threat. The topsoil layer is required to rehabilitate the area (i.e., for landscaping the area). **Δ** **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance= 4x4=16** **This impact is of negative high significance before mitigation.**	It is advisable that only vegetation be removed where and when it is necessary. After removal of vegetation, an offset needs to be incorporated by re-establishing natural vegetation/grassland along the road shoulder. No red data plant species were recorded during the site visits conducted. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**
Stockpiling of excavated material (C)	Soil and vegetation cover.	Precise location still to be determined; the impacts on soil and vegetation will occur wherever stockpiles	Stockpiles cause compaction of the soil, which promotes the establishment of weed species. The establishment of weeds greatly	Stockpiles must not exceed 2 metres in height. Stockpiles must be used for filling material as the re use of stockpiles cannot be done on the road.

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
		are established. Wherever possible, the stockpiles should be placed in non-sensitive areas.	reduces the pristine quality of the natural vegetation on site. Stockpiles should not be situated within 200 m from any water bodies or water courses, as sedimentation transport into such systems is undesirable. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**	By using the stockpiles as filling material for the sides, vegetation growth can be promoted by the seeds still contained in the topsoil layer. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**
Stockpiling building materials (C)	Soil and vegetation cover.	The impact is of a localized nature.	Stockpiles will need to be established for the storage of aggregate, bricks and cement. As mentioned, stockpiles cause compaction of the soil surface, which leads to the growth of unwanted weed species. **Probability = 3 (probable)** **Intensity = 2 (low intensity)**	Building material stockpiles must not be stockpiles within any of the riparian areas. Any alien vegetation that established itself because of disturbance need to be eradicated. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			Duration = 4 (long term) **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**	**Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**
Water use for construction purposes.	Use of ground water resources is possible but is it anticipated that natural surface water sources would be used. A **water license application** is being conducted in this regard. WULA will concentrate on: • Section 21(a): taking water from a water resource. • Section 21(b): storing water. • Section 21(c): impeding or diverting the flow of water in a	Local ground water and future dams.	The use of water as an important resource must be assessed carefully and a statement should be made on the impact once it has been established what the source of the water for construction purposes will be. The Water use licence is also necessary because of the dams being built, which will influence the riverbanks and will be less than 500 metres from a wetland. If water is used for the construction from groundwater sources, it is possible that the development can influence the ground water level. If water from the river is used, damage to the riverbanks can occur. **Δ**	If water is used for the road construction from groundwater sources, then a WULA will have to be issued in this regard, which is in process for this project. Possible significance assessment on ground water resources would be of moderate significance, because it will most likely come from boreholes that already have an established daily limit. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
	watercourse. • Section 21(i): altering the bed, banks course or characteristics of a watercourse.		**Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance = 4x4=16** **This impact is of negative high significance before mitigation.**	significance
Installation and operation of temporary sewerage systems for construction workers.	Soil layers, vegetation cover and groundwater.	Very localised and of a temporary nature.	The placement of chemical toilet systems and the servicing thereof will not have an impact on the environment, if operated according to requirements. Temporary toilets left unmanaged can leak raw sewage and effluent into the soil, surface and even ground water sources. Δ **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance = 4x4=16**	Temporary toilets need to be managed and serviced on a regular service schedule. This schedule has to be recorded and controlled by the contractor on site. Regular disposal of waste needs to be done by a contracted disposal company. No temporary toilets will be allowed within 100 metres from any of the drainage lines. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			This impact is of negative high significance before mitigation.	**Significance = 3x2=6** **This impact is of negative low significance**
Provisions for storm water i.e., storm water drainage (C)	Soil surfaces, vegetation cover and drainage patterns.	Areas where surface water run-off is collected i.e., like from compacted surfaces, as well as road surfaces.	Poorly implemented storm water outlets will result in increased surface run-off volume and speed, which could lead to the creation of erosion gullies. Storm water must be allowed to spread out gradually over a large surface area to protect the soil surface against erosion. Inadequate designed storm water outlets can lead to flooding of the road surface which is dangerous. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**	Storm water outlet designs have to be done and construction undertaken within the correct design. Vegetation cover needs to be established on bare soil areas to prevent erosion due to storm water. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Maintenance of storm water management systems (O)	Soil surfaces, drainage patterns and surface water.	In all areas where storm water management systems have to be created.	Storm water management will particularly be important with careful design eminent at the crossing of any natural drainage ways. Storm water outlets can get blocked due to debris and other substances that are washed from the road surfaces. This includes siltation due to soil erosion. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**	Maintenance of storm water outlets is required to ensure that they don't get blocked (i.e., no longer fulfil their function) or result in erosion. The custodian of the development has to perform regular checks and maintenance. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**
Excavations in general	Potential impact on elements of cultural or heritage importance.	Localised if these may occur	No indication of such impacts. But this will be confirmed in the Heritage report. It is possible that historically important structures, items or graves could be uncovered if construction commences.	If any artefacts, graves or articles of historical importance are found during construction, the construction activities have to be stopped and the area fenced off. A heritage consultant will have to be appointed to take any further related steps such as

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			Probability = 3 (probable) **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**	relocation. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**
Generation of construction waste (C)	Soil, vegetation, aesthetic quality of the site and surface water run-off, water and ground water resources.	All construction sites and directly adjacent areas.	Waste, such as building rubble and empty cement bags can be a negative visual impact if not collected and disposed of correctly. Further to littering the site and adjacent areas, poor control and illegal dumping of construction waste can pollute surface water run-off, as well as lead to the promotion of weed species. Δ **Probability = 4 (highly probable)** **Intensity = 4 (moderateintensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)**	Building rubble has to be collected at a centralized area and preferably in skip waste bins. No illegal dumping may be allowed in the construction phase and this will have to be checked and monitored by the appointed Environmental Control Officer. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			Significance = 4x4=16 **This impact is of negative high significance before mitigation.**	significance
Access road and internal road maintenance (O)	Vegetation and soil surface conditions, as well as social well-being of the residents of the area.	The entire road will need to be maintained.	Poorly maintained storm water drainage structure will cause abnormal soil erosion at outlets. Therefore, road maintenance is essential. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**	Road maintenance is essential and is the responsibility of the road custodian in the operational phase. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**
Collection and disposal of solid construction waste (C)	Aesthetic quality, surface water run-off, subsurface and groundwater quality, vegetation and fauna.	The site and directly adjacent areas.	Poor waste collection and handling will pollute the environment (affecting fauna, groundwater, surface water and aesthetic environment). **Probability = 3 (probable)** **Intensity = 2 (low intensity)**	No illegal dumping of domestic and construction related waste should be tolerated. Domestic construction waste has to be collected into central waste skip disposal units. **Probability = 3 (improbable)**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			Duration = 4 (long term) **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**	**Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**
Temporary employment created during the construction phases of the proposed road development(C)	Social aspects	All sites where construction related activities are to take place.	There will be **positive** impacts in terms of social upliftment and job creation within the broader region.	
Transportation of workers to and from the road development site (C)	Air quality, soil surface and social aspects (including traffic and worker safety).	The road safety of the region. A local issue.	Vehicles used to transport workers can be overloaded; worker safety is of utmost importance. Vehicles used to transport workers which exceed the speed limit are dangerous. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9**	Traffic safety measures have to be implemented by the contractor. Correct signage and safety clothing needs to be in place. Construction workers need to be transported to and from the site on a safe manner. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			This impact is of negative moderate significance	**Significance = 3x2=6** **This impact is of negative low significance**
Construction camp establishment (C)	Aesthetic impacts, social aspects, subsurface and groundwater quality, generation of domestic waste, vegetation removal, soil surface compaction and faunal impacts.	Location still to be determined.	The generation of domestic waste, as well as the provision of sewage facilities, within the construction camp could potentially impact on the aesthetics of the site as well as the quality of subsurface and groundwater if not properly managed and implemented. The removal of sections of natural vegetation would most likely be needed for the establishment of the camp, and soil surfaces would become compacted as a result of activities within the camp. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate**	Proper management of any temporary toilets need to be undertaken on a strict schedule. The construction camp must be more than 100 metres away from any water bodies. Construction camps **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			significance	
Housing of workers during construction (C)	Aesthetic character, soil and vegetation, surface water quality and social aspects.	The possibility of housing construction workers on site.	The establishment of housing for workers will have a localised impact on the soil and vegetation cover of the chosen site, as well as potentially having a negative impact on the quality of surface water – as a result of domestic waste, and sanitation facilities for example, if these are not properly addressed. Safety is also a concern to residence and stay of workers on site should not be encouraged. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**	Housing of workers on site, at the construction camp, is a possibility. Preferably only security should look after equipment at nighttime hours. If workers are housed near 'residential' areas, it could create a safety concern. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**
Sanitation provision to	Subsurface soil, surface	Insufficient chemical	Insufficient chemical toilets will have	Sufficient chemical toilets should be

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
workers during the working day (C)	water and subsurface water quality.	toilets will have a health impact locally.	a health impact. Subsurface soil contamination and contamination of surface/subsurface water quality could occur if the ablution facilities provided are not according to standard. A temporary impact is possible; however, it can easily be prevented. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**	provided for workers, in the range of 1 per every 8 workers, within walking distance of all construction activities. These toilets must be well maintained and inspected on a daily basis to ensure that they are clean and functioning properly. No washing of people and/or goods should take place on cleared surfaces, as this water should not be allowed to drain into any adjacent storm water canals or drainage lines. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**
Movement of construction vehicles on site (C)	Air quality, soil and vegetation cover.	Potential impacts may be eminent over a wide area if not carefully managed	Movement will cause limited or localised disturbances and temporary soil compaction, which promotes the	Alien plant species need to be controlled and it must be ensured that weeds are removed. Dust depression

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
		and restricted.	establishment of weed species. Dust will be generated by vehicular movements on site. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**	measures such as watering the bare surfaces need to be implemented. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**
Maintenance of construction vehicles (C)	Soil, vegetation and surface water.	Within the construction camp(s).	In the event of on-site repairs and servicing, soil surfaces, vegetation, and run-off may be locally contaminated. Spillage of fuel through faulty bowser is a possibility, if not controlled. It is anticipated that fuel storage facilities will occur on the site. If poorly installed or managed it will cause pollution. **Probability = 3 (probable)** **Intensity = 2 (low intensity)**	The construction camp has to be identified and communicated to the ECO as soon as its position is available. Any fuel depot areas have to be bunded and where fuel hoses will operate, absorbing gravel needs to be provided. This area can also be lined with a small piece of plastic below the gravel. As soon as any spillages occur, the gravel has to be collected and disposed of as hazardous waste.

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			Duration = 4 (long term) **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**	**Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**
Traffic safety on the main roads in the area (C and O)	Social aspects.	At all places where there will be interaction with the local traffic along existing routes as well as traffic moving through the area.	Motorists using the main routes and alternative roads may be negatively impacted on by slow moving construction vehicles. Δ **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance = 4x4=16** **This impact is of negative high significance before mitigation.**	Traffic safety measures have to be implemented to ensure that the general public is safe. Adequate traffic signage has to be implemented where any heavy vehicles will cross the main roads. Adequate clothing that is visible should be provided to the workers. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
Noise generation by operating air compressors, excavators and other heavy machinery. Noise is also generated by the construction workers (C)	Impacts on faunal surrounding landowners.	Areas on and surrounding site at which construction activities take place.	Excessive noise levels on site may negatively impact upon the behaviour and movements of site fauna. Surrounding landowners may also potentially be negatively impacted upon by excessive noise levels on site during construction. **Δ** **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance = 4x4=16** **This impact is of negative high significance before mitigation.**	Noise mitigation measures are required in order to keep the noise generated by construction activities as low as possible – given the site's relatively close proximity to some farmsteads. This can be achieved by ensuring that only well-oiled, well maintained machinery is used, as such machinery will produce less noise than poorly serviced machinery. For example, poor maintenance of exhaust systems will produce unnecessary noise pollution. Furthermore, working hours for construction should be limited to between 07h00 and 17h00 on weekdays, as construction outside of these time frames will be a nuisance to adjacent dwellers. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
				Significance = 3x3=9 **This impact is of negative moderate significance**
Heritage (C)	**Heritage or historical components**	No currently historical features identified are present on site. Still to be confirmed by a HIA specialist.	The proposed development is to be conducted on new sections not affected by previous road infrastructure. The interchanges are not situated on any historical landmarks. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**	If any areas of historical significance are discovered during construction, work should be stopped, and a cultural specialist should investigate the site. The first contact can be made with the EAP on site. **Probability = 3 (improbable)** **Intensity = 2 (low intensity)** **Duration = 2 (short term)** **Severity = 2x2=4 (rating 2)** **Significance = 3x2=6** **This impact is of negative low significance**
Impact on the river and wetlands	Water quality, soil, and the riverbeds	In and around the wetland and river areas.	Impacts on the riverbeds and wetlands will be caused by the construction of dam walls and box culverts. Possible siltation into rivers and wetlands is	Impacts in the river and wetland areas will have to be determining by an aquatic/wetland specialist. This will be conducted as part of the process after the EIA has been conducted and

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			highly likely. **Δ** **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance = 4x4=16** **This impact is of negative high significance before mitigation.**	will most likely be a request from the Department of Water Affairs. Activities undertaken within the river area has to be limited as far as possible and rehabilitation has to be undertaken during and after construction. **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance = 4x4=16** **This impact is of negative moderate significance after mitigation.**
Movement and survival of Animal species	Fauna of the site	Within the agricultural zone/dam wall and dam area where grassland will be removed/disappear.	The construction will have an effect on the animals present within the development sites. These impacts will include habitat destruction. **Probability = 3 (probable)** **Intensity = 2 (low intensity)**	Specialist studies will determine an overview of the habitat present in the proposed sites. Red data fauna have been recorded during the EAP's site visit. **Probability = 3 (probable)**

ENVIRONMENTAL ASPECT AND PROJECT STAGE	ENVIRONMENTAL COMPONENT THAT MAY BE AFFECTED	LOCALITY / APPLICABLE ZONE OF THE IMPACT	NATURE AND DESCRIPTION OF THE IMPACT/ISSUE BEFORE MITIGATION	NATURE OF THE IMPACT/ISSUE AFTER MITIGATION
			Duration = 4 (long term) **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**	**Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**
Construction of the development on red data animals	Animals	Within the agricultural zone/dam wall and dam area where grassland will be removed/disappear.	The construction of the development will influence animal life and habitat. Red data species were recorded during the site visits. **Δ** **Probability = 4 (highly probable)** **Intensity = 4 (moderate intensity)** **Duration = 4 (long term)** **Severity = 4x4=16 (rating 4)** **Significance = 4x4=16** **This impact is of negative high significance before mitigation.**	Although habitat will be lost, proper rehabilitation of the affected grassland and dam wall areas could lessen the severity of the impact. **Probability = 3 (probable)** **Intensity = 2 (low intensity)** **Duration = 4 (long term)** **Severity = 2x4=8 (rating 3)** **Significance = 3x3=9** **This impact is of negative moderate significance**

7.5.1.1 Summary of the Significance Rating of the Anticipated Impacts

ENVIRONMENTAL AND OTHER COMPONENTS TO BE AFFECTED C = relevant to construction stage O = relevant to operational phase	Probability value	Intensity value	Duration value	Severity value	Significance rating
Impact on the vegetation component of the site	C: 4 O: 3	4 2	4 2	4 2	16: High (negative) 6: Low (negative)
Impact on the faunal component of the site	C: 3 O: 3	2 2	4 4	3 3	9: Moderate (negative) 9: Moderate (negative)
Impact on Red Data Fauna and Flora	C: 4 O: 2	2 2	2 2	2 2	8: Moderate (negative) 4: Low (negative)
Impact on soil (surface stability)	C: 3 O: 2	2 1	2 4	2 2	6: Low (negative) 4: Low (negative)
Impact on soil (topsoil layer - disturbance and compaction)	C: 4 O: 2	2 2	2 2	2 2	8: Moderate (negative) 4: Low (negative)
Impact on subsurface soil quality	C: 2 O: 2	2 2	2 4	2 3	4: Low (negative) 6: Low (negative)
Impact on topography	C: 2 O: 0	2 0	2 0	2 0	4: Low (negative) 0
Impact on geology	C: 2 O: 0	2 0	2 0	2 0	4: Low (negative) 0
Impact on surface drainage and existing water bodies	C: 4 O: 4	4 2	4 4	4 3	16: High (negative) 12: Moderate (negative)
Impact on surface water run-off quality	C: 4 O: 3	2 2	2 4	2 3	8: Moderate (negative) 9: Moderate (negative)
Impact on groundwater resources	C: 4 O: 2	2 2	2 2	2 2	8: Moderate (negative) 4: Low (negative)
Impact on air quality	C: 3 O: 3	2 2	4 2	3 2	9: Moderate (negative) 6: Low (negative)
Impact on ambient noise levels	C: 4 O: 3	4 2	4 4	4 3	16: High (negative) 9: Moderate (negative)
Impact on cultural historical & archaeological elements	C: 0 O: 0	0 0	0 0	0 0	0 0
Impact on the social environment of the adjacent landowners	C: 3 O: 3	2 2	4 2	3 2	9: Moderate (negative) 6: Low (negative)
Impact on traffic safety aspects	C: 4 O: 3	4 2	4 4	4 3	16: High (negative) 9: Moderate (negative)
Impact on land use & agricultural potential	C: 3 O: 2	2 2	4 2	3 2	9: Moderate (negative) 4: Low (negative)
Impact on visual and aesthetic quality	C: 4 O: 4	2 2	4 2	3 2	12: Moderate (negative) 8: Moderate (negative)
Impact on local economy (due to job creation)	C: 4 O: 4	2 2	2 2	2 2	8: Moderate (positive) 8: Moderate (positive)
Impact on community (due to job creation)	C: 4 O: 4	2 2	2 2	2 2	8: Moderate (positive) 8: Moderate (positive)

8. KNOWLEDGE GAPS, UNCERTAINTIES AND ASSUMPTIONS

There were no knowledge gaps identified due to the fact that all relevant parties (I & APs and Specialists) were consulted, and valuable information was received, and recommendations made.

No assumptions were made also because the necessary studies were conducted, and the information was made available to relevant stakeholders and these studies were incorporated into the planning and design of this development.

Uncertainties will always be part of any development when it comes to the actual degree of impact it will have on the immediate environment, because no project is identical. Any and real results can only be recorded after the development has started and finished.

9. ENVIRONMENTAL IMPACT STATEMENT

9.1 DEVELOPMENT UPKEEP

All services and maintenance to this proposed development will also be part of the applicant's responsibility.

9.2 BIOPHYSICAL- AND SOCIO-ECONOMIC ENVIRONMENTS

9.2.1 Flora

The following recommendations are made with regards to the proposed development:

- (i) An Environmental Control Officer must be appointed to oversee mitigation measures during construction and will be responsible for the monitoring and auditing of the contractor's compliance with the conditions of the Environmental Impact Management Plan/ Programme.
- (ii) Clearance of areas deemed of high significance must be avoided as these areas include wetland pan areas and streams.
- (iii) A wetland delineation was undertaken by KEMS, and all buffer areas must be adhered to.
- (iv) Areas to be disturbed by construction activity as well as areas for ancillary activities such as stock piles must be clearly demarcated in already disturbed areas or areas where they will cause minimal disturbance.
- (v) Alien invasive species must be controlled before and after construction commences for the 3 recorded alien and invasive plant species recorded on site.
- (vi) Care needs to be taken to avoid the establishment and spread of pioneer and alien invasive species.
- (vii) Measures should be implemented to stop potential erosion.
- (viii) All mitigation measures described in this report must be adopted into a legal Environmental Management Programme to be used during construction of the planned project.

9.2.2 Historical Value

The following recommendations are proposed by the specialist:

- There are no visible restrictions or negative impacts in terms of heritage associated with the site;
- In terms of heritage the proposed project may continue; and

- The discovery of subsurface archaeological and/or historical material as well as graves must be taken into account in the Environmental Management Programme. See 3.2.6 and 3.2.7; and
- Submit this report as a Section 38 application to the relevant heritage authority for approval/comment.

9.2.3 Wetland Assessment and Delineation

Conclusions and recommendations:

The property has water courses and a wetland, and these should be avoided when planning developments. The average gradient of the site is relatively high and so the area is susceptible to erosion if measures are not put in place to prevent this from happening.

The risks identified, as listed in the Annexure, may all be mitigated provided that the ongoing management of the measures taken is maintained.

Care should be taken to undertake all developments on the property in such a way that soil erosion is avoided. The planned use would need workers on the site for much of the time. It is, therefore, necessary that there are adequate ablution facilities on the site and that these are serviced regularly.

9.3 COMPARATIVE SUMMARY ASSESSMENT BETWEEN THE ALTERNATIVES

Table 5: Comparative assessment between the Alternatives.

Environmental Aspects	Preferred Alternative (Proposed Development)	Alternative Livestock Activity	No-Go Option
Geology	No impact. Will not change.	No impact. Will not change.	No additional impact.
Topography	No impact. Will not change.	No impact. Will not change.	No additional impact.
Soil, Land Capability and Land Use	Soil compaction. Possible soil erosion due to removed vegetation. Surface disturbance and topsoil removal. Moderate impact on natural vegetation.	Soil compaction. Possible soil erosion due to removed vegetation. Surface disturbance and topsoil removal. Low impact on natural vegetation.	No additional impact.
Flora	Stripping of surface vegetation during construction. Moderate impact on sensitive flora around river and wetland sections.	Stripping of surface vegetation during construction. Moderate to low impact on sensitive flora around river and wetland sections.	No additional impact.
Fauna	Removal of surface vegetation thereby depleting food sources. Human presence resulting in emigration of animals. The disturbances of the vegetation cover and natural habitat will have an impact on the wildlife. However, it should be viewed against the background of the disturbances by human movement and activities through the area	Removal of surface vegetation thereby depleting food sources. Human presence resulting in emigration of animals. The disturbances of the vegetation cover and natural habitat will have an impact on the wildlife. However, it	No additional impact.

	already.	should be viewed against the background of the disturbances by human movement and activities through the area already.	
Surface Water	Impacts on the streams and wetlands will be caused by the addition of chemicals and possible siltation into streams and wetlands due to runoff. Drainage line could be altered or blocked by construction activities. A cumulative impact is anticipated due to additional activities occurring in the catchment system.	Impacts on the streams and wetlands will be caused by the addition of chemicals and possible siltation into streams and wetlands due to runoff. Drainage line could be altered or blocked by construction activities. A cumulative impact is anticipated due to additional activities occurring in the catchment system.	No additional impact, but there are impacts due to the wash-off occurring from the current road network into stormwater drainage systems.
Ground Water	Low potential environmental impact predicted. Temporary toilets (chemical) left unmanaged can leak raw sewage and effluent into the soil, surface and even ground water sources, during the construction phase.	Low potential environmental impact predicted. Temporary toilets (chemical) left unmanaged can leak raw sewage and effluent into the soil, surface and even ground water sources, during the construction phase.	No additional impact.
Air Quality	Low-to-moderate potential environmental impact. During the construction phase, dust could cause problems for nearby human settlements. During the operational phase the air quality will be the same as it currently is.	Low-to-moderate potential environmental impact. During the construction phase, dust could cause problems for nearby human settlements.	The air quality will be the same as it currently is.

		During the operational phase the air quality will be the same as it currently is.	
Noise	Low-to-moderate potential environmental impact. Noise from the traffic will be an inconvenience to a certain extent for some existing farm properties adjacent to the road.	Low-to-moderate potential environmental impact. Noise from the traffic will be an inconvenience to a certain extent for some existing farm properties adjacent to the road.	No impact additional impact.
Visual	Low significant impact. Waste, such as building rubble and empty cement bags can be a negative visual impact if not collected and disposed of correctly. New pivot systems and tunnels can be a negative visual impact, although there are plenty of these structures existing in the same area already.	Low significant impact. Waste, such as building rubble and empty cement bags can be a negative visual impact if not collected and disposed of correctly. New livestock structures can be a negative visual impact, although there are plenty of these structures existing in the same area already.	No additional impact.
Sensitive Landscapes	Sensitive landscapes identified will include all the drainage lines, streams and wetlands affected by the development. According to the wetland study a high potential impact is predicted before any mitigation measures is employed. • Removal of surface vegetation thereby	Sensitive landscapes identified will include all the drainage lines, streams and wetlands affected by the development. According to the wetland study a high potential impact is predicted before any mitigation measures is	No new or additional impact.

	depleting food sources. • Human presence resulting in emigration of animals. • The disturbances of the vegetation cover and natural habitat will have a limited impact on the wildlife. However, it should be viewed against the background of the disturbances by human movement and activities through the area. • The movement of water into wetlands could be altered by construction activities. • Erosion of the riverbank due to vegetation removal. • Increased runoff due to removal of vegetation and increased soil compaction can lead to siltation of the riverbed downstream.	employed. • Removal of surface vegetation thereby depleting food sources. • Human presence resulting in emigration of animals. • The disturbances of the vegetation cover and natural habitat will have a limited impact on the wildlife. However, it should be viewed against the background of the disturbances by human movement and activities through the area. • The movement of water into wetlands could be altered by construction activities. • Erosion of the riverbank due to vegetation removal. • Increased runoff due to removal of vegetation and increased soil compaction can lead to siltation of the riverbed downstream.	
Sites of Archaeological and Cultural Interest	No significant impact predicted.	No significant impact predicted.	No additional impact.

Socio-economic	Positive impact on the regional socio-economic structure through its support to the community, like: • Job opportunities during the construction phase. • Local economic boost.	Positive impact on the regional socio-economic structure through its support to the community, like: • Job opportunities during the construction phase. • Local economic boost.	Negative Impact due to no additional job opportunities created.
Interested and Affected Parties	Please see comment and response report in appendix 5F.	Please see comment and response report in appendix 5F.	No additional impact.
Cumulative	The cumulative impact of the development on the social environment is the upliftment in their daily livelihood due to new job opportunities. Seen at a wider scale the additional development is not physically connected, but the removal of vegetation cover, such that the soil surface is exposed, may lead to increased soil erosion in the area. Where the removal of natural vegetation/habitat may add to a bigger combined loss of natural vegetation/habitat in local area.	The cumulative impact of the development on the social environment is the upliftment in their daily livelihood due to new job opportunities. Seen at a wider scale the additional development is not physically connected, but the removal of vegetation cover, such that the soil surface is exposed, may lead to increased soil erosion in the area. Where the removal of natural vegetation/habitat may add to a bigger combined loss of natural vegetation/habitat in local area.	No additional impact. Status Quo.

9.4 Summary of the Positive and Negative Impacts/Risks of the Proposed Activity and Identified Alternatives

The identified alternative for this development has very similar overall impacts as the preferred alternative. Here follows a summary of the positive and negative impacts for this alternative including the preferred alternative.

Table 6: Summary of the positive and negative impacts of the proposed activity and identified alternatives.

PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES.	POSITIVES	NEGATIVES
Preferred Alternative	• Needed economic injection and social upliftment for the area. • It is an added food security development. • Most of the sites are already under an agricultural use.	• Loss of natural vegetation/habitat due to grassland section being used for agriculture. • Impacts upon the sensitive environments (wetlands, drainage lines, stream, and river) during the construction phase. • Water intensive exercise. Water resources will be under pressure.
Alternative Activity	• Needed economic injection and social upliftment for the area. • It is an added food security development. • Most of the sites are already under an	• Loss of natural vegetation/habitat due to grassland section being used for agriculture. • Impacts upon the sensitive environments

	agricultural use	(wetlands, drainage lines, stream, and river) during the construction phase. • Water intensive exercise. Water resources will be under pressure. • Odour developing from an intensive livestock development. • Contamination from the slurry / abattoir treatment facility could pose a risk to ground water.

10. CONCLUSION AND RECOMMENDATIONS

The Environmental Impact Assessment (EIA) Process for the proposed establishment of establishment of new land for crop production and some associated infrastructure such as a workshop and crop production tunnels on the Rem. of Por. 2 of the farm Uitmalkaar 126IR has been undertaken in accordance with the EIA Regulations published in Government Notice R 982 (326) of 4 December 2014 (7 April 2017), as amended, in terms of the National Environmental Management Act (Act No. 107 of 1998).

The essence of any EIA process is aimed at ensuring informed decision-making and environmental accountability, as well as to assist in achieving environmentally sound and sustainable development. This is achieved by conducting an analysis of the potential impacts that a proposed development may have on the physical, environmental, and social aspects of the concerned area. In order to minimise the potential impacts associated with the proposed development, an Environmental Management Programme (EMPr) is compiled, which must be implemented in order to sufficiently mitigate the anticipated impacts to an acceptable level.

In summary, it can be concluded that different parts of the proposed development concept will experience different impacts on the environment, social and economic aspects.

These are:

Environmental components to be affected negatively	Description of the anticipated environmental & socio-economic impacts / key issues
Properties (Farms)	• Noise and safety impacts, as well as loss of natural grassland.
Access to farms.	• Accesses have to be made safer by creating safer access roads and larger gates for farming equipment.
Noise Impact	• Very little noise will be created from farming equipment during planting and harvesting seasons.

Business/Agricultural areas	• Possible increase of income due to more production areas being created.
Water provision	• An increase in water demands due to the proposed development being very water intensive.
Land-use	• An increase of future agricultural production areas, although the loss of natural grassland and impacts on adjacent wetlands/rivers.
Environmental Sensitive Areas	• Loss of natural vegetation, wetland and impacts upon streams and drainage lines due to the proposed development, although the loss of habitat, proportionally to the wider region of similar natural vegetation, will be small to moderate.

10.1 AUTHORISATION OF PROJECT

The identification and description of the potential or anticipated impacts (herein referred to as environmental aspects) was the result of an assessment of the relevant environmental conditions and the issues identified during the public participation exercise, terrain assessments, specialist studies and desktop research. An objective rating of the SIGNIFICANCE of the potential impacts resultant of the proposed development revealed that impacts were predominantly MODERATE (negative) during the construction phase, but if mitigated correctly the significance of the impact drops to LOW. There are also two moderate (positive) impact anticipated (Local economy and social impact) during the operational phases respectively. This means that it is possible for the project to proceed, providing that the impact mitigation measures provided are strictly implemented in the design, construction and operational phases of the development.

The EIA process revealed that no fatal environmental flaws were identified that should prevent the approval of the proposed development. In summary, the main environmental aspects that need to be addressed during project implementation are:

- Design stage: The proposed development position layout should be well thought out, in terms of the proposed site and consequently is matter of fact so.

- Construction stage: Addressing general social and traffic safety, air quality, noise generated, waste management, construction activities and restoration/landscaping of the site.
- Operational stage: Maintaining all infrastructure on a regular basis and promoting jobs.

The ultimate approval of this project lies with the ruling of Mpumalanga DARDLEA. However, this Environmental Assessment Practitioner (REC) is of the independent opinion that the EIA process will conclusively determine if there are any fatal environmental flaws associated with the proposed development that would constitute the refusal of Authorisation of the project – bearing in mind that approval must be subject to strict implementation and monitoring of the EMPr compiled and given that there should be room for improving the EMPr as the project progresses. It is trusted that this EIR gives a balanced view of the anticipated environmental impacts associated with a proposed development of this nature.

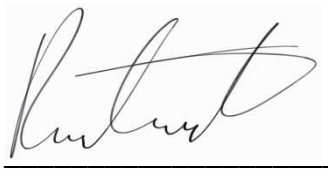
11. UNDERTAKING UNDER OATH BY THE EAP

An undertaking under oath by the EAP in relation to:

(i) the correctness of the information provided in the report;

(ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and

(iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties.



Rowan van Tonder

REC