CONSULTATION / DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

THE PROPOSED TOWNSHIP ESTABLISHMENT ON THE REMAINDER OF PORTION 3 OF THE FARM DOORNPAN 193 IP, NORTH WEST PROVINCE

SEPTEMBER 2022

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Report Title	Environmental impact assessment report for the proposed township establishment on the Remainder of Portion 3 of the Farm Doornpan 193 IP, JB Marks Local Municipality, North West Province
Document ID	Draft
Client/ Applicant	JB Marks Local Municipality
Date	September 2022
DOCUMENT APPROVAL	
EAP Name	Mankaleme Martina Magoro
Signature	

EAP DECLARATION OF INDEPENDENCE

I, **Mankaleme M. Magoro** in my capacity as an Environmental Assessment Practitioner, hereby declare that I-

- Act as an independent environmental assessment practitioner
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act (No. 107 of 1998)
- As a registered member of the South African Council for Natural Scientific Professions and the Environmental Assessment Practitioners Association of South Africa will undertake our profession in accordance with the Code of Conduct of the Councils
- Based on information provided to us by the project proponent, and in addition to information obtained during this study, have presented the results and conclusion within the associated document to the best of our professional judgement.

Signature of EAP:  Date Signed: 16/09/2022

EXECUTIVE SUMMARY

Leago Environmental Solutions was appointed by Nkanivo Development Consultants on behalf of the JB Marks Local Municipality as independent environmental assessment practitioners to undertake an environmental impact assessment process for the purpose of establishing a township. The proposed township establishment is to be situated on the Remainder of Portion 3 of the Farm Doornpan 193 IP, North West Province. The project area measures 88.46 hectares in extent and it is expected to yield 842 land uses / stands.

The application for environmental authorisation was initially submitted on the 20th of July 2021 to the Competent Authority, North West Department of Economic Development, Environment, Conservation and Tourism under Regulation 982 to 985 as amended by Regulation 324 to 327 of the National Environmental Management Act (No. 107 of 1998) and was assigned the reference number: NWP/EIA/36/2021.

The North West Department of Economic Development, Environment, Conservation and Tourism accepted the scoping report on the 13th October 2021 in terms of Regulation 22(a) of the NEMA Regulations and advised the Environmental Assessment Practitioner to proceed with undertaking the environmental impact assessment in accordance with the tasks that are outlined in the plan of study for environmental impact assessment. However, the previously lodged EIA application lapsed and the EIA application is now being re-submitted together with this draft environmental impact assessment report in terms of Regulation 21, Section 2(a) (b) and (c) of the EIA Regulations.

Specialist recommendations were also taken into consideration when compiling this report and this draft environmental impact assessment report will also be made available to stakeholders, interested and affected parties for observation and comments for a period of 30 days.

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ACRONYMS AND ABBREVIATIONS

NWDEDECT	North West Department of Economic Development, Environment, Conservation and Tourism
JBMLM	JB Marks Local Municipality
CA	Competent Authority
EMPr	Environmental Management Plan Report
EMP	Environmental Management Plan
NEMA	National Environmental Management Act
NEMPA	National Environmental Management: Protected Areas
S&EIR	Scoping and Environmental Impact Reporting
EIAr	Environmental Impact Assessment
I&AP	Interested and Affected Parties
EIA	Environmental Impact Assessment
EA	Environmental Authorisation
SAHRA	South African Heritage Resource Agency
SAHRIS	South African Heritage Resource Information Systems
IDP	Integrated Development Plan
CBAs	Critical Biodiversity Areas
PAs	Protected Areas
ESAs	Ecological Support Areas
PPP	Public Participation Process
RoD	Record of Decision
SDF	Spatial Development Framework
HIA	Heritage Impact Assessment
Ha	Hectares
No.	Number
ToR	Terms of Reference
PIA	Paleontological Impact Report
TIA	Traffic Impact Assessment
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer

GLOSSARY OF TERMS

Township establishment: *a process of converting an agricultural zoned land into residential, commercial or industrial properties.*

Environmental assessment practitioner: *is a consultant responsible for conducting environmental impact assessment.*

Environmental impact assessment*: a systematic process of identifying, assessing and reporting environmental impacts associated with an activity.*

Plan of study of environmental impact assessment*: a study contemplated in regulation 22 which forms part of a scoping report and sets out how an environmental impact assessment will be conducted.*

Proponent / applicant*: a person intending to submit an application for environmental authorisation*

Significant impact*: means an impact that may have a notable effect on one or more aspects of the environment or may result in noncompliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence.*

Development: *means the building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthworks or borrow pits, that are necessary for the undertaking of a listed or specified activity, [including any associated post development monitoring,] but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.*

Development footprint*: means any evidence of physical alteration as a result of the undertaking of any activity.*

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

Earth works: *this involves construction machinery, dampening and general preparation of the site for construction purposes.*

Mitigation measures: *all actions taken to eliminate, offset or reduce potentially adverse environmental impacts to acceptable levels (World Bank, 1999:1).*

Interested & affected party: *a person, group of people, an organisation (public or private), a business, or other party that has an interest or is affected in terms of their health, property rights, or economy by a proposed activity.*

Listed activities*: activities that have been recognised as having a detrimental impact on the environment.*

LIST OF APPENDICES

DETAILS OF THE APPLICANT AND THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Details of the Applicant	
Project Applicant	JB Marks Local Municipality
Physical Address	35 Wolmarans Street, Potchefstroom, 2531
Contact Person	Sandile A. Tyatya / Wynand Marx
Telephone	018 299 5111
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Table 1: Details of the Applicant

Details of the Environmental Assessment Practitioner	
Company Name	Leago Environmental Solutions
Physical Address	Unit 79, Block 5, Lombardy Business Park, 66 Graham Road, Pretoria, 0084
Contact Person	Mankaleme M. Magoro
Telephone	012 807 7445
Cell Phone	081 428 6116
Email	info@leagoenviro.co.za
Qualifications	Bachelor of Earth Sciences in Mining and Environmental Geology
Professional Affiliation	Pri. Sci. Nat Reg No.: 120970 (SACNASP) EAP Reg No.: 200/2254 (EAPASA)

Table 2: Details of the EAP

1. INTRODUCTION

Leago Environmental Solutions was appointed by Nkanivo Development Consultants on behalf of JB Marks Local Municipality as independent environmental assessment practitioners to undertake an environmental impact assessment process in terms of the National Environmental Management Act (No. 107 of 1998) read together with the Environmental Impact Assessment Regulations (GNR 326 of 7 April 2017) for the purpose of establishing a township. The proposed township establishment will be situated on the Remainder of Portion 3 of the Farm Doornpan 193 IP, North West Province. The proposed development site measures 88.46 hectares in extent and is expected to yield 842 stands / land uses.

1.1. Purpose of the Report

This draft environmental impact assessment report has been prepared in accordance with the EIA Regulations published in Government Notice No. R 326 of 07 April 2017. These regulations fall under Section 24(5) read with Section 44 of the National Environmental Management Act (No. 107 of 1998) as amended. NEMA Section 24(5) stipulates that listed activities require environmental authorisation from the Competent Authority.

Government Notice No. R325, Listing Notice 2 and GNR 324, Listing Notice 3 of the Environmental Impact Assessment Regulations (2017) identifies the following listed activities associated with the development of a township that require environmental authorisation by means of full EIA (Scoping and Environmental Impact Reporting).

1.1.1. Listing Notice 2, Activity 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.

Applicability to the project: the clearance of an area of 88.46 hectares of indigenous vegetation.

1.1.2. Listing Notice 3, Activity 12 (h)

The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan (ii) a protected area including municipal or provincial nature reserves as contemplated by NEMPAA or other legislation (iv) critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority.

Applicability to the project: the proposed development site is located on the eastern section of the Schoonspruit Nature Reserve and a Critical Biodiversity Area 1 (CBA1)

2. DETAILS OF THE PROPOSED DEVELOPMENT

2.1. Location of the Proposed Development

The proposed township establishment will be situated on the Remainder of Portion 3 of the Farm Doornpan 193 IP and it is located approximately 4 km away from the Ventersdorp CBD. Figure 1 and 2 below indicate the location of the proposed development site. The site is located roughly at the following GPS coordinates: Longitude 26°47' 25.04" E; Latitude 26°18'11.23"S and the SG 21 Digit Code is: T01P00000000019300003

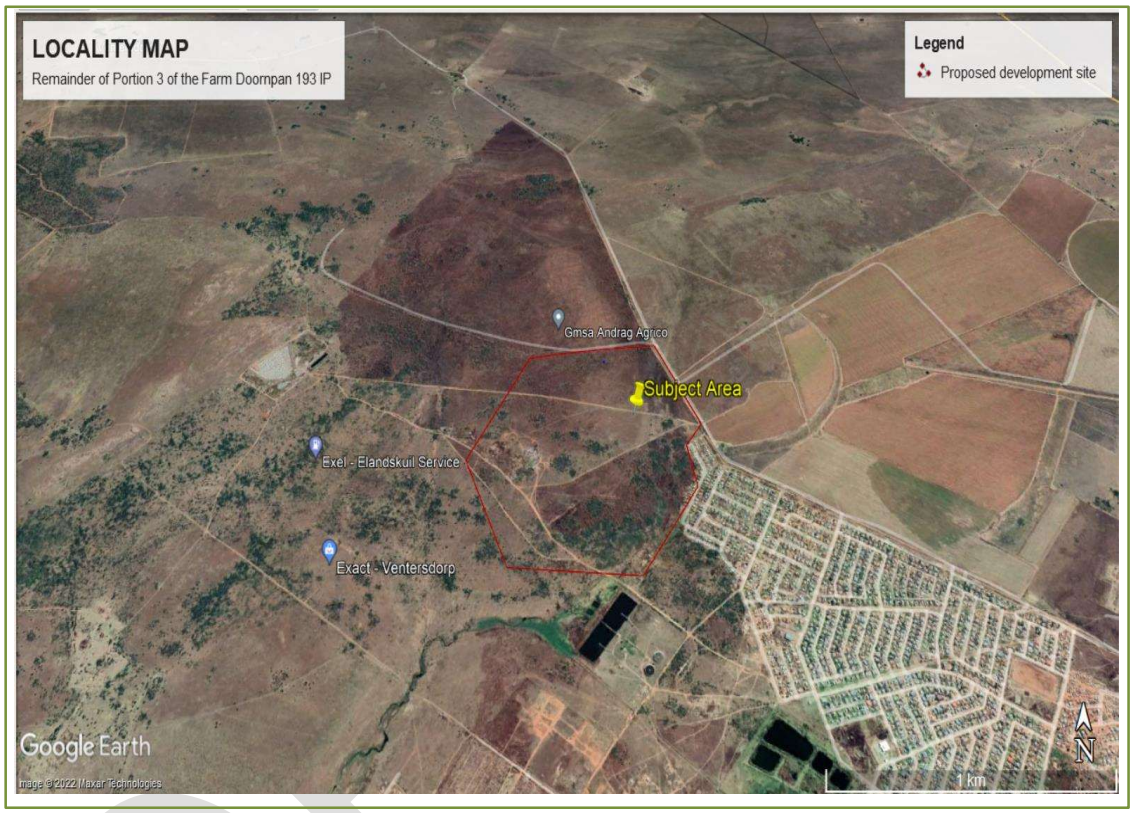

Figure 1: Aerial locality map of the proposed development site

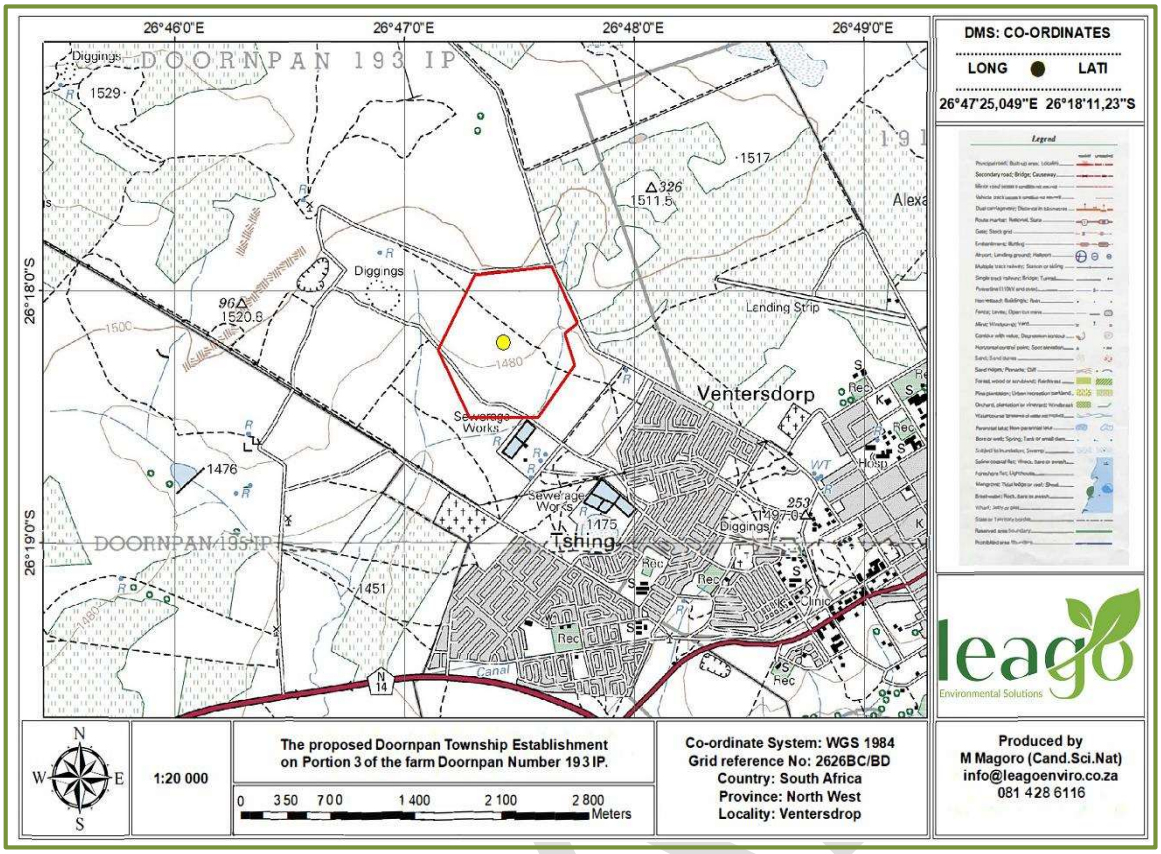

Figure 2: Topographic locality map of the proposed development site

2.2. Description of the Proposed Development

The proposed activity is a township establishment which will entail 842 land uses / stands. The proposed land uses are:

- 819 Residential (dwelling units)
- 2 Residential 2 (flat/ group units)
- 6 Business sites (commercial)
- 9 Institutional (school, crèche and public worship)
- 1 Recreational (sports centre)
- 1 Government
- 2 Municipal
- 2 Public Open Spaces

Figure 3 below depicts the proposed township layout plan.

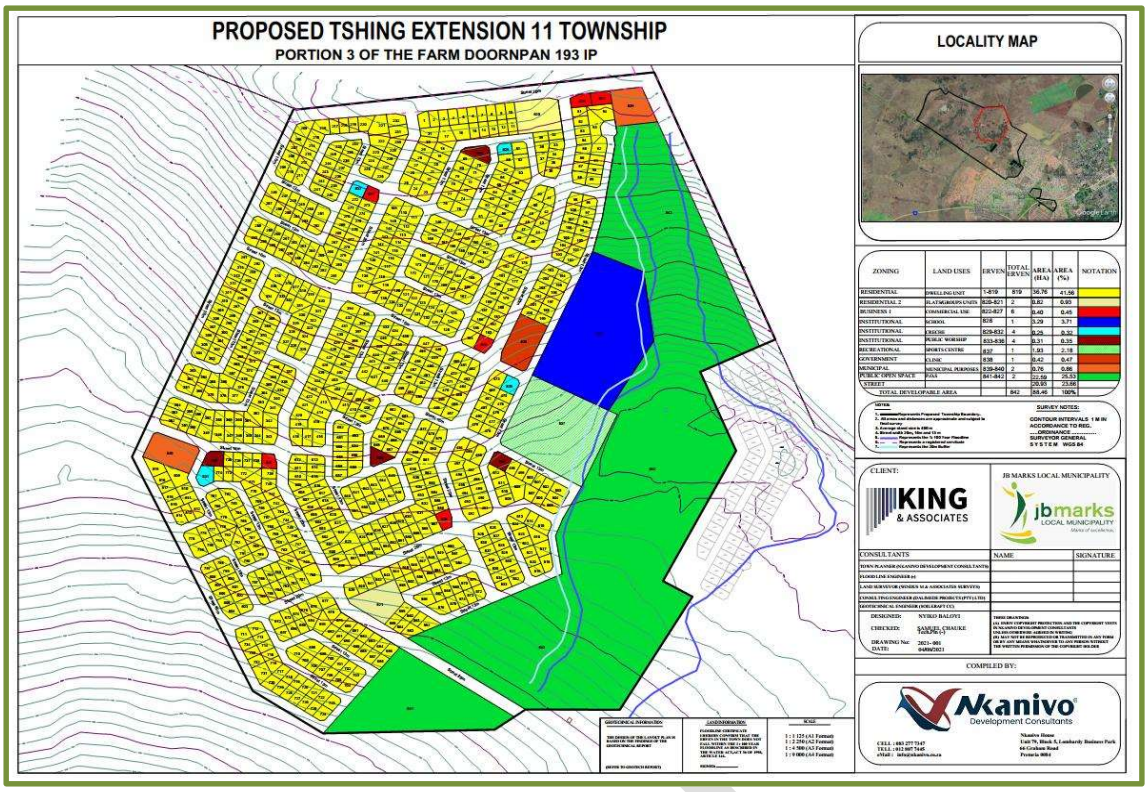

Figure 3: Layout plan of the proposed township

2.3. Status of the Project Area and Current Land-Use

2.3.1. Status of the Project Area

As part of the conditions of the scoping acceptance, the EAP was advised by the Competent Authority to further consult with the Biodiversity Management Directorate of the North West Department of Economic Development, Environment, Conservation and Tourism regarding the status of the project area which is a portion of the Schoonspruit Nature Reserve. Therefore, as part of the consultations, a site inspection was conducted with the Environmental Management and Biodiversity Management Directorates on the 19th November 2021. Comments were then received from the Biodiversity Management Directorate confirming that the proposed township establishment is within a declared nature reserve as per the Provincial Gazette of the Province of Transvaal in terms of Game Ordinance No. 23 of 1949 and Native Flora Protection Ordinance No. 9 of 1940.

The Biodiversity Management of the Competent Authority made the following recommendations:

- Written approval be sort from the landowner including substation of such change in land use
- Follow-up specialist study (ecology) be commissioned
- Site be subjected through online web based GIS portal for Private Protected Nature Reserves
- Report mentioned in bulletin 4 (iv) of the report titled "General Biodiversity and Ecological Report"

In response to the above requested information, written approval was sought from the management authority being the JB Marks Local Municipality, land cover map is attached as appendix 6.7.2., follow up biodiversity and ecological study was conducted and it is attached as appendix 4.1., report mentioned in bulletin 4 (iv) of the report titled "General Biodiversity and Ecological Report", is the Wetland Assessment and Functional Delineation Report and it is attached as appendix 4.4.

2.3.2. Current Land-Use

The project area is currently vacant and a small portion is being used as an illegal dumping site. The proposed development site is also not managed as a nature reserve.

4. CIVIL SERVICES ENVISAGED FOR THE PROPOSED DEVELOPMENT

4.1. Roads

The proposed development site is bordered by the National Road N14 and Road R30 which connects the site from N14 and R53. The site can be accessed through Dock Street which connects to R30.

4.2. Water

According to the Engineering Services Report, it is recommended that the new development site be directly serviced from the Ventersdorp reservoir/s. The current reservoir site is approximately 2 kilometres away from the proposed development site, with an estimated 31m difference in ground elevation (between the reservoir and the development site). As a result of the elevation difference the proposed bulk water can take advantage of the gravity and deliver water to the proposed site

4.3. Sanitation

The proposed development site does not have an existing sanitation. The nearby community of Tshing **(**Extension 5) is serviced by an existing sewer reticulation system. An Engineering Services Report addressing all the services required to service the proposed development is included as part of the appendices of this EIA report.

4.4. Electricity

The proposed township is located approximately 1.9km North-West (straight line distance) from the Ventersdorp Munic 88/11kV Substation. Medium Voltage (MV) electrical distribution to the area adjacent to the proposed Doornpan is done via existing 11kV overhead lines. The line is operated and maintained by the local municipality. An Electrical Report which addresses the specifications of electricity infrastructure network and connection points required to service the proposed township is included as part of the appendices of this EIA report.

4.5. Waste

All waste must be disposed of at the appropriate landfill site. Waste generated during the construction as well as operational phases of the project must therefore be disposed of at sites which have received the necessary permits or exemptions.

5. ALTERNATIVES

The EIA Regulations stipulate that a requirement of the Environmental Impact Assessments is to investigate feasible and reasonable alternatives to the project proposal.

The EIA Regulations define "alternatives", in relation to a proposed activity, as "different means of meeting the general purpose and requirements of the activity, which may include alternatives to –

- The property on which or location where it is proposed to undertake the activity
- The type of activity to be undertaken
- The design or layout of the activity
- The technology to be used in the activity
- The operational aspects of the activity

The concept of alternatives is aimed at ensuring that the best among all possible options in all aspects (environmental, socio economic, etc.) is selected. The option of not carrying out the proposed actions (no-go option) or developments is discussed to demonstrate environmental conditions without the project.

This means that for any project that is proposed, there should be a number of possible proposals or alternatives for accomplishing the same objectives or meeting the same need. Alternatives that would still meet the objective of the original proposal, but which would also have an acceptable impact on the environment (referring to physical, biological, aesthetic/visual) must be considered.

5.1. Feasible and Reasonable Alternatives Considered for the Proposed Development

5.1.1. Site Alternatives

The proposed development site is the only site that has been identified for by the applicant for establishing a township. The site was also selected so that the disturbed land can be developed. Therefore, site alternatives are not applicable for this project.

5.1.2. Activity Alternatives

The current preferred activity is deemed to be the only feasible activity alternative as this activity will result in improved housing which can accommodate more people**.** No other activities were considered in this application due to the assessed need and feasibility of the proposed activity.

5.1.3. Design Alternatives

The unique character and appeal of Doornpan were taken into consideration with the design philosophy. Various layout alternatives were considered by the applicant and town planners, also taking terrain and environmental constraints into account, hence the current design/ layout plan being the result, however there is a possibility of a layout alternative that will still meet the objective of the project scope

5.1.4. Technology Alternatives

As the preferred use is for a predominantly residential development there are limited technology alternatives that can be considered for these uses, although individual components of the development could utilise diverse technological alternatives.

5.1.5. Operational Aspects

The operational aspects of the activity relate to the improved housing for the local community. No other alternatives were deemed feasible other than the proposed activity

5.1.6. The Option of not Implementing the Activity

The direct impacts associated with the entire proposal not being approved include loss of opportunity to provide a new living environment with housing and associated facilities to people that the needs housing and loss of other potential socio-economic activities, in terms of job creation during both the construction and operational phases.

5.1.6. No-Go Alternatives

This option would come into effect if this assessment reveals fatal flaws in the process. To date no fatal flaws have been revealed. The no-go alternative of not developing the proposed site would leave the environment in the current state.

6. LEGISLATION, POLICIES AND GUIDELINES CONSIDERED

The following is a broad overview of the relevant legislation, policy and guidelines applicable to the proposed development.

6.1. The Constitution of the Republic of South Africa (No. 108 of 1996)

The Constitution is the most important part of a legislation that provides a framework for the environmental management in South Africa. Section 24 of the Constitution encourages the prevention of pollution and ecological degradation and also promotes sustainable ecological developments.

According to Chapter 2 of the Bill of Rights, everyone has the right to:

- An environment that is not harmful to their health or wellbeing,

- To have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that:
  - Prevent pollution and ecological degradation
  - Promote conservation and
  - Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Relevance to the project: the development of a township that is not harmful to human health or well-being.

6.2. National Environmental Management Act (No. 107 of 1998)

The National Environmental Management Act is South Africa's overarching framework for environmental legislation. NEMA sets out the principles of Integrated Environmental Management (IEM). It also aims to promote sustainable development, with wide-ranging implications for national, provincial, and local government. The key principles are that all developments must be environmentally, economically and socially sustainable and that environmental management must place people and their needs at the forefront, and equitably serve their physical, developmental, psychological, cultural and social interest. Section 2 of NEMA, sets out a range of environmental principles that are to be applied by all organs of state when taking decisions that may significantly affect the environment.

Section 24 states that the activities that may significantly affect the environment and require authorisation or permission by law must be investigated and assessed prior to approval. These activities are listed in Government Notice R324, R325 and R327, 07 April 2017. In addition, it provides for the Minister of Environmental Affairs or the relevant MEC to identify:

- New activities that require approval
- Areas within which activities require approval and
- Existing activities that should be assessed and reported on It also provides for the Minister to make regulations with respect to the manner in which investigations should occur.

Section 28(1) states that "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 pollution cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution. These measures may include:

- Assessing the impact on the environment
- Informing and educating employees about the environmental risks of their work and ways of minimising these risks

- Ceasing, modifying or controlling actions which cause pollution/ degradation
- Containing pollutants or preventing movement of pollutants
- Eliminating the source of pollution and
- Remedying the effects of the pollution

The authorities may direct the developer / applicant to rectify or remedy a potential or actual pollution problem. If such a directive is not complied with, the authorities may undertake the work and recover the costs from the responsible developer.

Relevance to the project: the applicant is obliged under Section 28 to take actions to prevent pollution or degradation of the environment.

6.3. Environmental Impact Assessment Regulations (2017)

The Environmental Impact Assessment Regulations, promulgated in terms of Section 24(5) of the National Environmental Management Act (No.107 of 1998) are divided into 3 Listing Notices, GNR 324, GNR 325 and GNR 327. GNR 327 defines activities which will trigger the need for a Basic Assessment and GNR 325 defines activities which trigger an Environmental Impact Assessment process. If activities from both Listing Notices are triggered, then an EIA process will be required. Regulation 324 defines certain additional listed activities per province.

Relevance to the application: this activity is listed under the current 2017 Environmental Impact Assessment Regulations of the National Environmental Management Act (No. 107 of 1998). The application will involve a number of listed activities, which are outlined in the report. The applicant will ensure that all requirements of NEMA are conformed with.

6.4. National Environmental Management: Protected Areas Act (No. 57 of 2003)

The National Environmental Management Protected Areas Act intends:

- To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes;
- For the establishment of a national register of all national, provincial and local protected areas;
- For the management of those areas in accordance with national norms and standards;
- For intergovernmental co-operation and public consultation in matters concerning protected areas and for matters in connection therewith

Relevance to the project: the proposed development is located on a portion of the Schoonspruit Nature Reserve.

6.5. National Heritage Resources Act (No. 25 of 1999)

In terms of Section 38 of the Heritage Resources Act, a Heritage Impact Assessment has to be undertaken for the following developments:

- Or other activity which will change the character of a site
- Exceeding 5000 m^2 in extent or
- Involving three or more existing erven or subdivisions
- Involving three or more erven or divisions thereof which have been consolidated within the past five years
- The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
- The re-zoning of a site exceeding 10 000m^2 in extent or
- Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Section 38 of the NHRA makes provision for developers to apply for a permit before any heritage resource may be damaged or destroyed.

Relevance to the project: the proposed activity is a township establishment, therefore will change the character of the site and it also exceeds 5000 m^2

6.6. National Water Act (No. 36 of 1998)

Water use is controlled by the National Water Act and the enforcing authority, Department of Water Affairs. The National Water Act recognises that water is a scarce resource in South Africa and its provisions are aimed at achieving sustainable use of water to the benefit of all users.

The provisions of the Act are thus aimed at discouraging pollution and waste of water resources. In terms of the Act, a land user, owners or occupier on whose land an activity occurs which causes or has the potential to cause pollution from occurring. Non-compliance with this provision constitutes a criminal offence. Water use is defined in the Act and can be broadly summarised as the abstraction, consumption and discharge of water. The use of water includes:

- Abstraction of water from either the ground water or from surface water
- The discharge of water containing waste into a water resource
- Impeding or diverting the flow of water in a water course Unless authorised by a General Authorisation, a license is required to use water in this manner.

In terms of discharging water containing waste to a water resource, a General Authorisation is applicable when:

- It conforms to a required standard
- The volume is less than 2000m³/ day
- The discharge is registered with the Department of Water Affairs and Forestry (DWAF)

In addition, irrigation of any land with water containing waste is a controlled activity and a Water Use License is required unless authorised by a General Authorisation. Should any activities, structures or infrastructure cross into any watercourse, a Water Use Licence must be applied for, which is obtained from the Department of Water and Sanitation (DWS). Water use for "non-consumptive use" such as the building of a bridge or laying of sewer pipe in a watercourse may be covered under a General Authorisation, depending on the risk posed to the watercourse and catchment. Therefore, a separate water use risk assessment and then potential a water use licence application may need to be undertaken.

Relevance to the project: the findings of the Wetland Assessment and Functional Assessment indicated that the proposed development will require to undergo a full WULA process to obtain a Water Use Licence.

6.7. The North West Biodiversity Sector Plan

The aim of the Biodiversity Sector Plan is to identify the minimum area necessary to conserve and maintain biodiversity and major ecological infrastructure in the province.

Relevance to the project: the proposed development site is located on an area that is declared a critical biodiversity area 1 (CBA1).

7. NEED AND DESIRABILITY OF PROPOSED DEVELOPMENT

- The proposed development will contribute towards improving the housing stock of the area and general livelihood of the residents.
- The existing road leading to the existing township will provide access to the proposed township establishment.
- There will be sites for business opportunities for the residents
- Furthermore, the development will eventually be integrated with the environment, have proper service provision and it will be well planned.
- The proposed township will create job opportunities and ensure social upliftment of the area, create investment opportunities and create a sustainable development environment.
- The proposed development will increase the availability of housing
- The development will promote the economic growth within the JB Marks Local Municipality.

The development is desirable due to its location in terms of:

- The proposed development site is strategically located next to the current boundaries of the existing township of Tshing.
- The site can be accessed through the existing internal roads within the adjacent township as well as the provincial and national roads such as the R30 and N14
- The proposed development will not have a significant detrimental impact on the surrounding areas and is not in conflict with the adjacent land uses.

8. DESCRIPTION OF THE RECEIVING ENVIRONMENT

8.1. Physical Environment

8.1.1. Topography and Drainage

The topography of the proposed development site is of low relief and relatively flat gradient.

8.1.2. Climate

The climate in Tshing (Doornpan) is warm, temperate and it is characterised by hot and rainy summers as well as cool and dry winters. The average annual temperature is 25°C and receives approximately 346.1mm annual rainfall.

8.1.3. Geology of the Area

The proposed development site is located on the Rietgat Formation, which is under the Ventersdorp Super Group and comprises mainly of greenish-grey amygdaloidal and porphyritic lava, with interbedded shale, tuff, greywacke, conglomerate and impure limestone with algal structures.

8.1.4. Hydrology

No ground water seepage was encountered in any of the test pits during the geotechnical investigations and there were also no indications of temporary perched water tables in the soil profiles.

8.2. Biological Environment

8.2.1. Vegetation

The vegetation on site is largely natural and modifications are limited to a waste dumping site and walking tracks that cut across the site. There are no prominent rocky outcrops present on site.

9. SUMMARY OF FINDINGS AND RECOMMENDATIONS OF SPECIALIST STUDIES

Specialist studies have been undertaken and the impacts were identified and mitigation measures were also provided. The specialist studies undertaken are included as appendix 4 of this report. A summary of the more relevant findings of each study are set out below:

9.1. General Biodiversity and Ecological Assessment Report

Details of the Specialist:

Afrika Enviro & Biology
P.O. BOX 2980
White River, 1240

Contact Number: 072 623 1845
Email: danie.aeb@gmail.com

Contact Person: Danie van der Walt
Area of Expertise: Environmental Scientist and Biodiversity Consultant

FINDINGS

Ecology & Biodiversity

Nationally, the vegetation type is classified as Dry Cymbopogon-Themeda Veld (VT 50) and Cymbopogon-Themeda Veld (VT 48) (Acocks, 1953) and Dry Sandy Highveld Grassland (LR 37) (Low and Rebelo, 1996). On a regional scale the veld unit is classified as Vaal – Vet Sandy Grassland (Gh10) according to Mucina & Rutherford (2006). Gh10 mostly occurs in North-West and Free State Provinces from its northern distribution, in an area south of Lichtenburg and Ventersdorp, stretching to Klerksdorp, Leeudoringstad, Bothaville and Brandfort in the south. This vegetation type is classified as endangered because approximately 63% of it has been transformed for commercial crop cultivation and grazing pressure from cattle and sheep. Only 0.3% of this vegetation type is statutorily conserved in Bloemhof Dam, Schoonspruit, Sandveld, Faan Meintjies, Wolwespruit and Soetdoring Nature Reserves

Protected Areas

The proposed site is located within a proclaimed protected area, the Schoonspruit Nature Reserve which is listed on the register of Protected Areas, subject to the National Environment Management Protected Areas Act (2003).

Modified Land

A section of land was used previously as a borrow pit and until recently as an informal waste dumping site. The natural environment has been totally transformed as result of these activities. The vegetation consists largely of weeds and alien as well as indigenous invasive species: Vachellia karroo, Pennisetum clandestinum, *Tagetes minuta, Verbena officinalis, Conyza bonariensis, Achyranthes aspera, Avena fatua, Bidens bipinnata, Gomphrena celosioides, Physalis angulata, Oenothera rosea, Oenothera tetraptera, and Cirsium vulgare*. Due to the modified state of this land it is of low biodiversity and ecological sensitivity.

Terrestrial Fauna

Frogs

A diverse range of frogs will utilise the aquatic and terrestrial habitats on the site. Nineteen frog species' range of distribution includes the study area. All frogs can be regarded as being sensitive to negative environmental drivers such as pollution and loss of natural habitat. No frogs were recorded.

Reptiles

The terrestrial habitats present in the study area will provide habitat for a diverse group of reptiles (Bates et al, 2014). The study area, possess 18 endemic and near endemic species all of which have the potential of being present in the study area. However, the presence of reptiles will be subject to the availability and quality of habitat and ecological aspects such as the availability of food. For example, the absence of rocky areas will eliminate species associated with this habitat from being present. Species that can be expected will be associated with grassland and the presence of water. No reptiles were recorded.

Birds

Due to the topography and habitat types present in the study area, the expected birds will be limited to grassland and wetland specific species. Red Data Listed species expected for the larger study area are included on Table 3.3 of the Follow up/ Amended General Biodiversity and Ecological Report.

Mammals

Due to the degraded state of habitat on site and in the local area as well as the land uses and human traffic in the general area it is expected that only small mammals will be present. However, two species of mammals were recorded: Mongoose and Ground Squirrel. One RDL species has a potential of being present and will be limited to the wetland habitat.

RECOMMENDATIONS

- Select the site with the objective to minimise negative impacts on biodiversity and ecology (e.g. exclude sensitive areas such as rock outcrops, wetlands and streams).
- Conserve sensitive ecosystems (wetland and hydrological features).
- Limit the disturbance to the development footprint only.
- Conserve as much as possible of the natural vegetation within the immediate surroundings.
- Employ an alien invasive management plan to ensure that invasive vegetation does not establish on site or the surrounding area after completion.
- Before construction commences the site must be investigated for the possible presence of slow moving and sub terrain fauna.

- Once site preparation commences, any fauna that are disturbed and comes out of hiding must be allowed to escape to the natural surroundings.
- During the construction phase excavations must be monitored daily for trapped animals that must be assisted to escape or be removed by a suitably experienced person.

9.2. Heritage Impact Assessment

Details of the Specialist:

PGS Heritage

906 Bergarend Streets
Waverley, Pretoria

Contact Number: 012 332 5305
Email: polke@pgsheritage.co.za

Contact Person: Polke Birkholtz / Cherene de Bruyn
Area of Expertise: Heritage Specialist and Archaeologist

FINDINGS

Fieldwork

Seven archaeological sites (DP-01 to DP-07) consisting of low-density surface scatters of Stone Age material were identified. Throughout the fieldwork, hand-held GPS devices were used to record the tracklogs that show the routes followed by the two archaeologists on site. All sites identified during the fieldwork were photographically and qualitatively recorded, and their respective localities documented using a hand-held GPS device.

Palaeontology

The PalaeoMap on the SAHRIS database, indicates that the palaeontological sensitivity of the proposed project footprint is of moderate to low palaeontological sensitivity.

RECOMMENDATIONS

A desktop palaeontological assessment must be undertaken by a professional palaeontologist. And the recommendations made in the palaeontological report must be implemented.

9.3. Desktop Palaeontological Impact Assessment

Details of the Specialist:

Alan Smith Consulting

29 Browns Grove, Sherwood,

Durban, 4091

Contact Number: 031 208 6896
Email: asconsulting@telkomsa.net

Contact Person: Alan Smith
Area of Expertise: Palaeontology Specialist

FINDINGS

The proposed development site is located on the Malmani Subgroup dolomite. This rock contains stromatolite fossils.

RECOMMENDATIONS

- Chance Find Protocol" is recommended as the site includes areas flagged red on the SAHRIS Palaeosensitivity Map
- Should caverns or caves be encountered development will be stopped in these areas. These sites can then be demarcated for future investigation
- In the case of any unusual finds, a Palaeontologist must be notified immediately by the ECO and/or EAP and a site visit must be arranged at the earliest possible time with the Palaeontologist.

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

- The construction must be halted in that specific area and the Palaeontologist must be given enough time to reach the site and remove the material before excavation continues.
- Mitigation will involve the attempt to capture all rare fossils and systematic collection of all fossils discovered. This will take place in conjunction with descriptive, diagrammatic and photographic recording of exposures, also involving sediment samples and samples of both representative and unusual sedimentary or biogenic features. The fossils and contextual samples will be processed (sorted, sub-sampled, labelled, boxed) and documentation consolidated, to create an archive collection from the excavated sites for future researchers

9.4. Wetland Assessment and Functional Delineation

Details of the Specialist:

Triplo4 Sustainable Solutions (Pty) Ltd
Suite 5, The Circle, Douglas Crowe Ave
Ballito Business Park
Dolphin Coast, 4420

Contact Number: 031 563 4422
Email: hantie@triplo4.com

Contact Person: Suheil Malek Hoosen / Chen Read

Area of Expertise: Wetland Specialist

FINDINGS

The wetlands that have been delineated within the study area have undergone moderate to large disturbances from historic and current land use practices. The overall PES scored for the at risk wetlands were primarily as a result of anthropogenic pressures in the catchment and wetland extent namely; construction of linear infrastructure (dirt and tar roads, overhead power lines) within the catchment, increase in hardened surfaces in the catchment predominantly by informal development, ad hoc dumping, construction of WWTWs through wetland and proliferation of AIPs due to the aforementioned changes. This indicated that modifications have moderately and largely impacted the wetlands within the study area which has subsequently impacted on the habitat quality, diversity, and size.

A total of three (3) wetlands were identified within the 500m regulated buffer. These wetlands were classified as one (1) channelled valley bottom (CVB01) wetland and two (2) unchannelled valley bottom wetlands (UVB01 and UVB02). All of the aforementioned wetlands were determined to be at risk.

RECOMMENDATIONS

It is recommended that no development occurs within the wetland and associated buffers. The proposed development must also undergo a full WULA process.

9.5. Engineering Services Report

Details of the Specialist:

Ukhozikazi Projects (Pty) Ltd
322 Whisken Avenue
Midrand, 1684

Contact Number: 010 206 9054
Email: gugu@ukhozikazi.co.za

Contact Person: Gugulethu Mthethwa
Area of Expertise: Civil Engineer

FINDINGS

Water

Water is primarily obtained from underground boreholes in the Ventersdorp area. Ventersdorp collects spring water from the Ventersdorp Eye, which is delivered to the treatment plant through a 3km concrete lined canal. The water treatment work's estimated design capacity is 14Ml/day, but it is currently unable to function at full capacity.

The proposed development site is currently not serviced. The nearby community of Tshing Extension 5 is serviced from the Ventersdorp reservoirs and is currently metered by the Municipality.

Fire Water Status

No fire hydrants were noted on site and no provision for fire was made.

Water and Fire Water System

The proposed site is currently not serviced, and the surrounding areas receive adequate water. A bulk water analysis and master plan was previously conducted by Moedi Consulting Engineers. The provision and master planning for water infrastructure is as shown in Annexure A of the Engineering Services Report.

Sanitation

The area of the proposed new development does not have existing sanitation. Nearby settlements have dedicated sewer reticulation networks which discharge sewer at the Ventersdorp WWTW.

RECOMMENDATIONS

Water Use

It is recommended that the upgrade of the Water Treatment Works be prioritised to accommodate the proposed township.

Sanitation

The Ventersdorp Waste Water Treatment Works has currently reached its design capacity and the upgrade of the Works should be prioritised to accommodate the development of Portion 3 of the farm Doornpan 193 IP.

Proposed Bulk Water Supply

The proposed water line recommends that the new development site be directly serviced from the Ventersdorp reservoir/s (Co-ordinates 26°18'43.49"S, 26°48'47.10"E). The current reservoir site is approximately 2 kilometres away from the proposed development site, with an estimated 31m difference in ground elevation (between the reservoir and the development site). As a result of the elevation difference the proposed bulk water can take advantage of the gravity and deliver water to the proposed site

9.6. Electrical Report

Details of the Specialist:

Buro Tech Consulting Engineers CC

141 Main Street, Heatherdale,

Karenpark, 0118

Contact Number: 082 600 8328
Email: nicovw@burotech.co.za

Contact Person: Nico van Wyk/ Ralph Gordon
Area of Expertise: Engineer

FINDINGS

Existing Networks

There are no electrical reticulation networks existing within the project envelope of the proposed Doornpan township. The proposed township is located approximately 1.9km North-West (straight line distance) from the Ventersburg Munic 88/11kV Substation. Medium Voltage (MV) electrical distribution to the area adjacent to the proposed Doornpan is done via existing 11kV overhead lines. The line is operated and maintained by the local municipality.

Available Capacity

Eskom Planning Engineers indicated that 2x 10MVA transformers are installed at Ventersburg Munic substation. This means that the total installed capacity is 20MVA, and the firm installed capacity is 10MVA.

Eskom indicated that a maximum demand of 12MVA was recorded, meaning the substation is operated over its firm installed capacity of 10MVA, but that 8MVA spare capacity is available in terms of the total installed capacity. The final estimated maximum demand for the new development is calculated to be 2 700 kVA (2.7MVA).

RECOMMENDATIONS

Eskom proposed that the substation be upgraded to a 2x 20MVA substation to ensure adequate firm capacity be available, but awaits Municipal acceptance to proceed with an indicative cost estimate.

9.7. Geotechnical Investigations

Details of the Specialist:

Zwandazwashu Consulting (Pty) Ltd
Unit 01A Stanford Park
817 16th Road
Randjespark, Midrand, 1685

Cell: 079 081 2369/ 067 706 9904
Email: admin@zwandazwashu.co.za

Contact Person**:** Mavhetha Lavhelesani
Area of Expertise: Geologist

FINDINGS

Ground Subsidence

No signs of previous subsidence were evident during the site investigation. The site can be classified as a mining active area, however, there are no underground mining directly below the site. Should the new information relating to mining activity or seismic activity later uncovered, the Department of Mineral Resources (DMR) will be consulted.

Sinkhole Formation

The available geological maps and geological mapping from site investigations indicate that the site is not underlain by dolomite or soluble rocks/minerals.

Landslides and Mudslides

Though the site is underlain by mudrock (shale), the probability of landslides and mudslides occurring within this area are remote.

Falls and Rockslides

The probability of the occurrence of rock falls and rockslides is low due to the gentle gradient.

RECOMMENDATIONS

The foundation recommendations include the following:

Reinforced Strip Foundation / Modified Normal

The recommended foundation type is a reinforced strip foundation founded on a G8 engineered soil mattress. The in-situ material can be utilised for founding material as there are of G8 material on site. Reinforcement should be designed by a competent person. The following construction procedures apply:

- All topsoil to be stripped to spoil
- Foundation trenches for 600mm wide strip footing to be over-excavated to 1.0m wide by 1.6m deep below existing ground level
- Excavation to be backfill with G8 quality material to a depth of 0.6m existing ground level
- G8 material to be compacted in 150mm thick layers to 93% Mod AASHTO density at –1% to +2% OMC
- Strip footings 500mm wide and adequately reinforced should be constructed at a depth of 0.6m
- The allowable bearing capacity should be limited to 150kPa on the engineered soil mattress
- Articulation joints at some internal doors and all external doors;
- Light reinforcement in masonry

Raft Foundation

Excavate the in-situ material down to 0.9 m – To spoil and stockpile [Excavated sand may be mixed with coarse materials (sand/concrete) and utilized for construction and foundation lining

- Bottom of excavation to be approved by a Geotechnical Engineer
- Import more competent material (G5/G7) and compact into layers of not more than 750 mm thickness,
- The foundation bed is then compacted by ramming
- Lay reinforcement on spacers over the foundation bed
- The foundation may stiffen by ribs or beams built in during construction which will add extra strength and rigidity

9.8. Floodline Determination

Details of the Specialist:

Dalimede Projects (Pty) Ltd

No. 11 Pierre street, IT Park RentCo Building Office 6,

Bendor, Polokwane, 0699

Contact Number: 015 291 0775
Email: admin@dalimede.com

Contact Person: Litmos Mthunzi
Area of Expertise: Engineering Technologist

FINDINGS

Flood line Modelling

The HEC-RAS model was used to determine the flood line during the event of a flood for any return period, and in this case the 1:100-year floods were modelled.

Cross Section Profile

Cross sectional data was generated using GIS and CAD software, as well as the 0.5m contour lines that were obtained from the topographic surveyor.

In terms of Section 114 of the National Water Act (No. 36 of 1998) the above-mentioned property is partially affected by flood water within the 1:100 period from the stream / river.

RECOMMENDATIONS

It is recommended that a buffer zone of 20m should be provided between the 1:100 flood line and the proposed development.

9.9. Storm Water Management Plan

Details of the Specialist

Dalimede Projects (Pty) Ltd
No. 11 Pierre street, IT Park RentCo Building Office 6,
Bendor, Polokwane, 0699

Contact Number: 015 291 0775
Email: admin@dalimede.com

Contact Person: Litmos Mthunzi
Area of Expertise: Engineering Technologist

FINDINGS

Flooding

The proposed development will tend to reduce the natural rainfall infiltration and increase storm runoff. Downstream flood damage risks will therefore increase unless adequate attenuation of flood runoff is provided collectively in the watercourses and on individual sites if necessary. The design of the major stormwater system must address this issue as far as possible and must be designed such that the downstream post-development flood risks are no greater than the pre-development flood risks.

RECOMMENDATIONS

- Protection of the natural watercourses to prevent pollution, erosion and retain runoff.
- Promotion of subsoil infiltration where possible
- Provision of indigenous vegetation along watercourses and stabilisation of banks
- Provision of in-stream installations at selected sites to trap first-flush pollution and non-soluble trash and litter entering the stormwater system.
- Attention to development of on-site use rainfall attenuation and provisions for reducing runoff by in-catchment and on-site evaporation and evapo-transpiration.
- Local flood risk reduction by selection of appropriate design standards for culverts and stormwater attenuation facilities
- Implementation of adequate on-site and localised stormwater management practices
- Attenuation of flood peaks to predevelopment levels at the 2% (50-year) and the 10% (100-year) risk level
- Matching of new impermeable areas with sufficient flood attenuation and evaporation provisions

- The potential increase in catchment runoff must be balanced against the combined effects of evapo-transpiration from catchment vegetation, evaporation from water bodies plus the retention and re-use of both storm runoff and treated wastewater.
- The potential increase in flood peaks must be mitigated to at least predevelopment levels by the provision of sufficient stormwater detention facilities at micro and macro levels.
- The potential increase in flood volumes must be mitigated where possible by subsoil infiltration, retention of runoff in on-site facilities for irrigation use and unsaturated wetland areas where evaporation and infiltration can help to reduce flood runoff rates.
- Installations must be provided to contain pollution as close to source as possible and in a practical location for servicing by Department of Solid Wastes.

The Stormwater Management Philosophy for the housing development encourages developers, their professional teams, contractors, and property owners to do the following:

- Always maintain adequate ground cover at all places and to negate the erosive forces of wind, water and all forms of traffic.
- Prevent concentration of stormwater flow at any point where the ground is susceptible to erosion.
- Reduce stormwater flows as much as possible by the effective use of attenuating devices.
- Ensure that development does not increase the rate of stormwater flow above that which the natural ground can safely accommodate at any point in the sub catchments.
- Ensure that all stormwater control works are constructed in a safe and aesthetic manner in keeping with the overall development.
- Prevent pollution of water ways and water features by suspended solids and dissolved solids in stormwater discharges.
- Contain soil erosion, whether induced by wind or water forces, by constructing protective works to trap sediment at appropriate locations. This applies particularly during construction
- Avoid situations where natural or artificial slopes may become saturated and unstable, both during and after the construction process

9.10. Traffic Impact Assessment

Details of the Specialist

ABIDIA Civil / Structural Engineers

Cedarwood Crescent West Acres

Nelspruit, 1201

Contact Number: 083 470 2027

Email: abramuko@gmail.com

Contact Person: Abraham Mukokanduku
Area of Expertise: Traffic Engineer

FINDINGS

Existing Traffic and Operation Scenario

Traffic counts over the two-day period were conducted along the intersections A, B & C on the 14th & 15th May 2021. The manual counts are attached (kindly refer to Annexure B of the TIA Report) and Sidra Analysis conducted attached (refer to Annexure C of the TIA report). The traffic count was conducted for one weekday (Friday) and one weekend (Saturday). Also noticed is the lack of a designated taxi rank, lack of drop-off zones especially near schools, creches and communal amenities.

Existing Traffic Condition

The effects of COVID 19 affect the existing traffic condition and a factor of 1.2 has been applied to take care of the lockdown effects. A factor of 1.2 has been adopted since the Doornpan community were on a relaxed mode of lockdown, there was minimum compliance to lockdown effects.

Existing Road Condition

Intersection A is in a fair to poor condition, however though paved there are no road markings with a lot of gravel silting taking place, at all the intersections that were investigated.

In terms of cracking, Manaka Street is a paved road and can be classified, as low that is >0<4%. No AADT information obtained from a Permanent counting station within Doornpan, hence only the manual counts attached herein under Annexure B of the Traffic Impact Assessment report.

The Visual Condition Index categorises the extent of pavement distress with low % indicating high and visible distress and 100% indicating no signs of visual distress and hence road pavement in fair to good condition with VCI>75%.

Intersection B is also paved but due to gravel silting taking place it can equally be classified as gravel intersection, and by extension with no stop signs.

Municipal Roads

Planned new roads in the area will influence the distribution of the trips of the proposed developments and access points to the exiting road network. The development of a road master plan for JB Marks Local Municipality is still at inception stage, and the official only stated that a municipal road is earmarked for future development from N4 to R33. With the above said, though it will not interfere with the proposed boundary development footprint, the analysis was also supposed to cater for the traffic flow generated by such development.

Peak Hours

Peak Hours were noted to coincide with morning and afternoon peak periods as below: Morning Peak hour: 08:00 - 09:00hrs and Afternoon Peak hours: 16:00 – 17:30hrs, these peak periods will inevitably change during weekends especially from 10:30hrs until 16:00hrs.

Traffic Growth

The land along N14 Provincial Road and R30 Road is identified for node development. This land comprises of three farms, Elandskuil RE 206, RE 3/205 and RE 205 and it approximately covers an area of 242ha. Ventersdorp Municipal area is said to be an area of "high density" and "medium accessibility". This implies that, there is a high concentration of people in Ventersdorp and the surrounding rural areas traveling at least thirty (30) minutes to gain urban access, either travelling to Potchefstroom of Klerksdorp. The proposed node development will have a great impact on the economic growth of Ventersdorp.

Traffic Operations

For safe operations, Doornpan Development will require upgrade from gravel to a paved road if funds permit and regular routine maintenance in the form of appropriate sidewalk, signage and road markings. The issue of the impact of construction-traffic during construction must be considered. During the construction phase large, heavy trucks, plant and equipment will be accessing the site. The impact on traffic operations will be that these vehicles, being large, take up the majority of the available roadway, particularly on roads that are only 3.0m wide. Opposing traffic will be faced with a reduction in safety and will be forced onto the verge. Whilst this condition cannot be quantified the situation will present itself to existing users on random basis. Construction traffic should where possible utilise the proposed (along the proposed main access side) detour during morning and afternoon off-peaks.

RECOMMENDATIONS

- To ensure safe and satisfactory operations, upgrade and routine maintenance for all roads and at intersections should be identified along with improvements to road markings and signage
- Proposed main access (Intersection A and B) to have preferably a stop controlled intersection with dedicated left and right turning lanes from the proposed developments, together with acceleration and deceleration 60m lanes, due to space constraints
- The potential of the 2041 traffic growth will require upgrades to intersections A and B
- It must be noted that, Intersection A, and B are all viable options for alternative access and traffic tributaries.

Site Specific Recommendations

- Public transport facilities to be provided

- Pedestrian Facilities: It is recommended that a pedestrian walkway of 1.5-2.0m is provided along the Class U4b roads within the proposed developments to facilitate pedestrian movement. However, if funds do not permit, a 15m road reserve to provide pedestrian space and avoid conflict with traffic vehicles.

10. ENVIRONMENTAL IMPACT DETERMINATION AND EVALUATION

10.1. Methodology to Assess the Impacts

To assess the impacts on the environment, the process has been divided into two main phases namely the Construction phase and the Operational phase. The activities, products and services present in these two phases have been studied to identify and predict all possible impacts.

In any process of identifying and recognising impacts, one must recognise that the determination of impact significance is inherently an anthropocentric concept. Duinker and Beanlands, (1986) in DEAT 2002, Thompson (1988), in DEAT 2002 stated that the significance of an impact is an expression of the cost or value of an impact to society.

However, the tendency is always towards a system of quantifying the significance of the impacts so that it is a true representation of the existing situation on site. This has been done by using wherever possible, legal and scientific standards which are applicable.

The significance of the aspects/impacts of the process have been rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The consequence matrix use parameters like severity, duration and extent of impact as well as compliance to standards. Values of 1-5 are assigned to the parameters that are added and averaged to determine the overall consequence. The same process is followed with the likelihood that consists of two parameters namely frequency and probability. The overall consequence and the overall likelihood are then multiplied to give values ranging from 1 to 25. These values as shown in the following table and are used to rank the significance.

Significance	**Low**	**Low-Medium**	**Medium**	**Medium-High**	**High**
Overall Consequence X Overall Likelihood	1-4.9	5-9.9	10-14.9	15-19.9	20-25

Table 3: Significance Ratings

SEVERITY	
Low	Low cost/high potential to mitigate. Impacts easily reversible, non-harmful insignificant change/deterioration or disturbance to natural environments.
Low-medium	Low cost to mitigate small/ potentially harmful moderate change/deterioration or disturbance to natural environment.
Medium	Substantial cost to mitigate. Potential to mitigate and potential to reverse impact. Harmful Significant change/ deterioration or disturbance to natural environment.
Medium-high	High cost to mitigate. Possible to mitigate great/very harmful, very significant change/deterioration or disturbance to natural environment.
High	Prohibitive cost to mitigate. Little or no mechanism to mitigate. Irreversible. Extremely harmful Disastrous change/deterioration or disturbance to natural environment.
DURATION	
Low	Up to one month
Low-medium	One month to three months
Medium	Three months to one year
Medium-high	One to ten years
High	Beyond ten years
EXTENT	
Low	Project area
Low-medium	Surrounding area
Medium	Within JB Marks Local Municipality
Medium-high	Within Dr. Kenneth Kaunda District Municipality
High	Regional, National and International
FREQUENCY	
Low	Once a year or once during operation
Low-medium	Once in 6 months
Medium	Once a month
Medium-high	Once a week
High	Daily
PROBABILITY	
Low	Almost never/ almost impossible

Low-medium	Very seldom/ highly unlikely
Medium	Infrequent/ unlikely/ seldom
Medium-high	Often/ Regularly/ Likely/ possible
High	Daily/ Highly likely/ definitely
COMPLIANCE The following criteria are used during the rating of possible impacts	
Low	Best practise
Low-medium	Compliance
Medium	Non-compliance/conformance to Policies etc. – Internal
Medium-high	Non-compliance/conformance to Legislation etc. – External
High	Directive, prosecution of closure or potential for non-renewal of licences or rights

Table 4: Description of the parameters used in the matrixes

A summary of the anticipated environmental impacts that are likely to occur as a result of the planning, construction, and the operational phase, as well as the proposed mitigation measures that may eliminate or reduce the potential impacts are outlined below.

11. KEY ENVIRONMENTAL IMPACTS

Environmental Issues	Possible Cause	Potential Impacts	Proposed Mitigation Measures
Air Pollution and Noise			
Smoke	• Vehicle emissions • Fires	• Health problems • Air pollution • Public nuisance • Noise pollution	• All vehicles and equipment/ machinery must regularly be checked to ensure that they are in good working order to minimise pollution. • Ensure that cleared areas and unpaved surfaces are sprayed with water to minimise dust generation. • Existing access / haulage routes must be utilised during the construction as far as possible • Approved soil stabilizers may be utilised to limit dust generation. • Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour. • Rehabilitate disturbed areas as soon as construction activities are finished in that area • Material loads shall be suitably covered and secured during transportation. • The location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors.
Dust	• During construction • Vehicle operation on roads • Vegetation clearing		
Fumes	• Fumes from vehicles • Fumes from machinery		
Noise	• Construction machinery and vehicles • Presence of construction camp • Operation noise (music and people)		

			• Provide personal protective equipment (PPE), such as dust mask and goggles. • Limit construction activities to day time hours.
Water Quality			
Pollution of water sources	• Spillage of fuel & oil from vehicles • Spillage of building material e.g. cement etc. • Migration of contaminants off the site • Solid waste in storm water • Littering	• Pollution of surface and groundwater • Health risk • Lower water quality • Soil degradation • Erosion • Siltation	• A waste contractor must be appointed to oversee the entire waste management process during construction phase. • Storage areas must be bunded to protect groundwater quality and to avoid soil degradation / pollution • All solid waste generated during the construction process (including, plastic, rubble, cut plant material, waste metals etc.) must be placed in the waste collection area in the construction camp and must not be allowed to blow around the site • A buffer zone of 20m should be provided between the 1:100 flood line and the proposed development • Oil spills must be cleaned immediately with an oil spill kit. • All areas of loose sand, which are prone to wind erosion must be sprayed with water or other dust suppression techniques.
Silt deposition in surface water	• Erosion risk due to increased run-off from built up area • Erosion from cleared areas during construction		
Pollution from sanitation system	• Leakages of system and incorrect management of sanitation system • Inadequate measures to prevent sewage spillages • Overflow of sewage to groundwater		

			• No vehicles, machinery or equipment with leaks or causing spills may be allowed to operate on the construction site. • Dirty water originating from the construction site and camp should be contained and disposed of correctly, preventing contamination of soil and any watercourses in the area • Maintenance of construction vehicles should be carried out in a well-designed and protected area and where oils / grease will be completely restrained from reaching the ground and the wetland. • Drip trays should be used during the servicing of vehicles. The content thereof must be disposed in accordance with relevant hazardous material disposal requirement • Measures to contain spills must be readily available on site (Spill Kits).
Water Quantity			
Impact on amount of water resources available	• Over-utilisation of available water	• Lose scarce resource • Increased pressure on	• Encourage water reuse/ recycling during construction phases. • Avoid wasting the water supplied to the site.

		ground water supply sources	
Land/ Soil Degradation			
Soil contamination and degradation	• Spillages of oil, chemicals from machinery & vehicles • Removal of vegetation during clearing for construction / Site clearing during construction • Sewerage spillages • Erosion due to increased runoff from built-up areas • Increased erosion of drainage channels	• Soil degradation • Loss of topsoil • Dust formation • Erosion	• Regular maintenance of the construction vehicles need to be done to ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from the site to an appropriate location / facility, preventing overflow of sewage to ground water. • Removal of vegetation should be restricted to areas identified on the project description / footprint • Ensure that the provision of all services (sewer) are in accordance with relevant Council requirements
Biodiversity			
Decline in fauna and flora diversity	• Cleaning of site for construction • Pollution of soil • Pollution of water resources • Physical establishment of development • Loss of habitat due to establishment of development	• Loss of biodiversity • Loss of habitat • Negative impact on biodiversity • Negative impact on rare /endangered/	• The clearing of vegetation must be restricted to areas identified on the project footprint • Indigenous trees must not be cut disturbed or removed without a permit from forestry as required by the National Forest Act • No-go areas must be determined and demarcated and agreed upon by contractors, engineers and ECO before any construction activities can occur onsite

		endemic species and habitats	
Cultural/ Heritage			
Possible loss of heritage sites	• Damage / loss during construction • Damage / loss during operation.	• Possible loss of cultural heritage	• SAHRA must immediately be alerted in case evident or artefacts, paleontological fossils, additional graves or heritage resources are discovered during the course of development. • Chance Find Protocol is recommended
Visual Impact			
Impact of the proposed development on the sense of place	• The physical existence of the development	• Negative impact on landscape quality character • Negative impact on sense of place	• Due to the development of residential development, there will be a new visual impact. The site is however surrounded by existing townships and should not change the visual characteristics of the area dramatically. • The implementation of a large residential development cannot be entirely mitigated, however, the use of harmonious architectural themes, colour co-ordination, finishes for roofs and walls with existing development in the neighbourhood etc., contributes to creating an aesthetically pleasing environment and the establishment of a new sense of place
Visual impact	• Construction site and buildings • Lights at night	• Obstruction • Visual intrusion	• Due to the development of residential development, there will be a new visual impact. The site is however

	• Presence of new development • Overhead power lines	• Public nuisance	surrounded by existing townships and should not change the visual characteristics of the area dramatically.
Health and Safety			
Security	• Influx of people to area including construction workers and others after completion	• Loss of safe and secure environment • Threat to health • Danger to human life	• Demarcation of the construction site to prevent public access (during the construction phase). • A limited number of workers along with security guards will be allowed to sleep on site, however within a cordoned-off secure area • All staff must carry identification, access control must also be enforced.
Fires	• Accidental fires • Burning of waste • Cooking with fires		
Socio - Economic Impacts			
Impact from change of land use from a nature reserve to township.	• Change of land use to residential, business, institutional, educational, public open spaces and streets	• Change of land use of an area	• The change in land use will provide housing for the surrounding communities and also provide employment opportunities during the construction and operational phase.

Employment creation and skills development opportunities during the construction and operation phase, which is expected to give rise to new jobs. **This impact is rated as positive**.	The establishment of a township	• Employment opportunities • Permanent jobs during operation • New housing	• Enhance the use of local labour and local skills as far as reasonably possible • Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained. • Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible
Impact of the residential development on adjacent landowners	• Noise from construction activities, • Dust generated by construction vehicles and from site preparation. • The visual impact of lights. • The visual impact of residential and other units (business, institutional etc.)	• Nuisance and disruption • Noise pollution • Air pollution • Negative visual impact	• Construction activities must be between normal working hours 8:00 to 17:00 week days with no construction activities taking place during weekends. • Dust suppressants must be used to reduce the amount of dust produced which also contributes to the reduction of air pollution • The location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors.

Impacts related to the establishment of a construction camp with accommodation	• Location of construction camp. • Environmental impacts of construction activities e.g. spillage of hazardous liquids such as oil and fuel onto the soil surface. • Accommodation of construction teams on site • Littering, accidental fires, collecting of firewood and poaching. • Undesirable visitors to the area	• Adverse impact on the environment. • Resentment from neighbouring residents	• No domestic waste water (grey water) should be allowed to be discharged from the construction camp • Demarcation of the construction site to prevent public access • Only construction workers along with security guards will be allowed to sleep on site
Ground and water pollution from littering and waste disposal during construction and operational phases	• The presence of a large work force and equipment and machinery during construction causing littering and dumping refuge and builder's rubble on site • Construction activities from heavy vehicles and machinery	• Soil and water pollution	• A waste contractor must be appointed to oversee the entire waste management process during construction phase. • Storage areas must be bunded to protect groundwater quality • All solid waste generated during the construction process (including packets, plastic, rubble, cut plant material, waste metals etc.) must be placed in the waste collection area in the construction camp and must not be allowed to blow around the site
	• The construction of structures such as open trenches and earth heaps might also hold safety risks for people	• Safety risks for motorists, passengers, pedestrians and residents of the area	

	• A lack of proper ablution facilities for temporary workers during construction	• Soil and water pollution • Unhygienic conditions • Health risk	• Oil spills must be cleaned immediately with an oil spill kit. • No vehicles, machinery or equipment with leaks or causing spills may be allowed to operate on the construction site. • Dirty water originating from the construction site and camp should be contained and disposed of correctly, preventing contamination of soil and any watercourses in the area • Maintenance of construction vehicles should be carried out in a well-designed and protected area and where oils / grease will be completely restrained from reaching the ground and the wetland.
Impact from the provision of structures and infrastructure services	• The development, construction and provision of infrastructure services • Poor design - structural failures	• Pollution from sanitation systems • Pollution of water resources • Negative visual impact of overhead power lines and electricity supply	• Ensure that the provision of all services (water and sewer) are in accordance with relevant Council requirements • Any amendments, upgrading or changes to the infrastructure must be approved by the relevant Councils • The installation of services should be tightly monitored and controlled by the relevant authorities • Infrastructure must be designed according to the minimum requirements of the relevant councils and

		and waste removal. • Soil erosion as a result of the construction of internal roads and water reticulation networks	must therefore be submitted to the Local authority for approval • The monitoring of the proposed development must be done on a bi-annual basis to ensure that structural faults do not result in the unnecessary contamination of the wetlands. • All stormwater management infrastructure must divert flow away from areas susceptible to erosion, specifically steep slopes and wetlands • Ensure compliance with the industry standards
Impact on archaeological /cultural / social features	• The development of structures and infrastructure services for residential and other sites • Clearing of construction sites. • Construction of access roads. • Excavation of trenches for the installation of underground pipelines and cables	• Negative impact on cultural or heritage resources	• SAHRA must immediately be alerted in case evident or artefacts, paleontological fossils, additional graves or heritage resources are discovered during the course of development. • Chance Find Protocol is recommended
Job creation and ownership of stands **This impact is rated as positive**.	• Temporary jobs during construction phase • Permanent jobs during operation • New housing • New businesses • New school (school/ crèche)	• Positive impact – job creation	

Table 5: Environmental impacts identified

12. PUBLIC PARTICIPATION PROCESS UNDERTAKEN

12.1. Introduction and Objectives

The public participation process is an important component of the Environmental Impact Assessment process (Scoping and Environmental Impact Assessment) and is therefore, critical to the success of the project / application. The purpose of the PPP is to ensure that all the views and concerns of all the interested and affected parties are identified, recorded and addressed during the process.

The key objectives of the public participation process are to:

- Identify a broad range of I & APs, and inform them about the proposed project;
- Understand and clearly document all issues, underlying concerns and suggestions raised by the I & APs; and
- Identify areas that require further specialist investigation.

12.2. Methodology

The public participation process was undertaken in accordance with the plan of study as part of the Scoping Report that was accepted in terms of Regulation 22 (a) of the NEMA Regulations. The following activities have already been undertaken as part of this process:

- Advertisement on the local newspaper
- Placement of the on-site notices/ notice boards
- Delivery of project background information notices to the landowners adjacent to the proposed development site.
- Email consultations with stakeholders

12.2.1. Newspaper Advertisement

The proposed project was advertised in the local newspaper namely **Potchefstroom Herald** (see appendix 6.5) on the 22 July 2021 to inform people about the project and to request them to register their names and comment on the proposed development.

12.2.2. Site Notices

Site notices were placed at various points around the proposed development site (Kindly refer to appendix 6.6).

12.2.3. Background Information Notices/ Letters

Notices/ letters regarding the background information of the proposed development activity were also hand delivered to the landowners/ occupiers located next to the proposed development site (see appendix 6.2).

12.2.4. Consultation with Stakeholders

The scoping report was circulated and draft EIA report will also be circulated to the stakeholders and I&APs for a period of 30 days for observation and comments.

13. CONCLUSIONS

The purpose of this report is to provide the Competent Authority, North West Department of Economic Development, Environment, Conservation and Tourism with sufficient information regarding the potential impacts of the development to make an informed decision regarding the approval of the proposed township establishment.

The proposed development has no fatal flows in terms of the biophysical and socio economic environment. In fact, it is believed that the proposed development compliments the required and desired balance to be achieved between the socio-economic and environmental factors.

The environmental management plan and all the mitigation measures provided in the specialist reports should be strictly adhered to, therefore mitigating impacts as far as possible. Should this site not be developed, it will remain as isolated and an unconnected area that will be vulnerable to crime, illegal waste dumping and potential illegal informal occupation.

14. RECOMMENDATIONS

The EAP recommends that the "township establishment" option which has been identified as the preferred alternative is used. It is further recommended that this application be approved with the following conditions:

- The conditions of the Environmental Authorisation from the Competent Authority (NWDEDECT) must be adhered to at all times.
- The responsibilities to obtain any further authorisations and/or licenses will rest on the proponent or applicant of the project, **PRIOR** to the commencement of any activities on site
- An ECO must be appointed to monitor compliance with the environmental authorisation and develop compliance reports to be submitted to the Competent Authority during the construction phase of the township.
- The EMP attached and the mitigation measures related to it must be adhered to at all times and the appointed ECO must ensure that the developer complies with the environmental management plan.
- Communication or awareness must be undertaken to the project team to ensure maximum participation and compliance to the conditions of the environmental authorisation.
- All the recommendations in the specialist reports that are included as a part of this application should be implemented & strictly adhered to in order to counteract adverse environmental impacts.